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A thesis submitted in partial fulfillment of the requirements for the degree of PhD

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Faculty of Humanities
University of Oslo

2013

Contents

Acknowledgments

I am deeply thankful to the Faculty of Humanities for providing me with the financial support to embark on the stimulating three-year journey that has now produced this thesis.

Many individuals made my work both possible and pleasurable. First and foremost, I owe profound gratitude to my supervisor, Anne Danielsen, who has been a source of inspiration for me throughout the process. Serving as my supervisor while I was a master's student, Danielsen first introduced me to the work of Louis Marin, who greatly influenced this thesis. She also granted me a master's student scholarship to participate in her research project, "Rhythm in the Age of Digital Reproduction," from which I learned a lot and to which I owe my decision to continue with music research after I had finished my master's degree. She has always been open-minded and generous with her time and knowledge, and I also appreciated her detailed and constructive comments on all of my drafts, and her general encouragement and support along the way.

I am also very grateful to Nils Nadeau, who copyedited this thesis, as well as most of my published articles and paper manuscripts. In addition to his thorough and well-considered improvement of my language, he has offered clever and constructive queries that have enabled me to improve the content considerably.

I want to thank all of my colleagues at the Department of Musicology at the University of Oslo, in both the academic and the administrative staffs, for the pleasure of their company and for their help and valuable insights. In particular, I am very grateful to Stan Hawkins for his constructive and detailed feedback on papers and drafts, for his invitations to various seminars at the University of Oslo and the University of Agder, and for his introductions to distinguished scholars such as Simon Frith, Allan F. Moore, Derek B. Scott, Philip Tagg, and Robert Walser. His guidance has helped my awareness of where I position myself intellectually within the field of popular music. Tellef Kvifte has also been a great inspiration to me, and I thank him for his sharp-eyed readings of drafts and for his instant exposure of my leaps of logic in our discussions. I am also grateful for the many interesting and inspiring (academic and nonacademic) discussions I have had with Hans T. Zeiner-Henriksen, whom I

have been so fortunate to have as my office neighbor. Special thanks go to Arnfinn Bø-Rygg, Rolf Inge Godøy, Alexander Refsum Jensenius, Mats Johanson, Jørgen Langdalen, and Ståle Wikshåland for guiding me to many valuable academic resources.

I have benefited much from my fellow PhD students, in particular those with whom I have met regularly in discussions and reading forums: Eirik Askerøi, Kjetil Klette Bøhler, Marita Buanes Djupvik, Peter Edwards, Håvard Enge, Mia Göran, Marion Hestholm, Risto Holopainen, Hedda Høgåsen-Hallesby, Eystein Sandvik, Marie Strand Skånland, Maria Witek, and Mikkel Broch Ålvik. Special thanks go to Hedda, who read through two of my chapters during their later stages and offered comments that improved them significantly. Special thanks also go to Paul Harkins (University of Edinburgh), with whom I have co-written an article and discussed many things throughout my PhD period.

Susan McClary offered valuable and insightful comments on papers, as well as the drafts of two of my articles, during her time as Professor II at the University of Oslo. I am also thankful for the feedback of Tor Dybo, Allan F. Moore, Michael Rauhut, Derek B. Scott, and Robert Walser during various seminars. My thanks also go to Nils-Egil Langeland and Eivind Engedal for reading and commenting on some of my drafts concerning studio production, to Hildegunn Lauve Hansen for designing the illustrations, and to Gisela Attinger for helping me with the references.

The Faculty of Humanities granted me financial support for six-week stays at the University of Edinburgh and at Columbia University. I am very thankful to Simon Frith for inviting me to be a visiting scholar at the University of Edinburgh, for giving me constructive comments on my early drafts, and for letting me attend his inspiring seminars, through which I met several generous and engaging PhD students as well. My thanks also go to Nick Prior (University of Edinburgh), who met with Paul Harkins and me and gave us helpful feedback on an early draft of our article on mash-up music. I am also very grateful to Lydia Goehr for inviting me to be a visiting scholar at Columbia University, for reading through many of my texts, for offering me valuable feedback and guidance, and for letting me attend her inspiring classes and seminars, as well as several very enjoyable evenings at restaurants with her and her study group. I also thank her for putting me in touch with Bernard Gendron, who was kind enough to read through several of my chapters and discuss them over some very pleasant dinners.

This thesis has been the basis for several publications. Parts of chapter 2 appear in Ragnhild Brøvig-Hanssen (2013): "The Magnetic Tape Recorder: Recording Aesthetics in the New Era of Shizophonia," in *Material Culture and Electronic Sound*, eds. Frode Weium and Tim Boon, pp. 131–57 (Washington, D.C.: Smithsonian Institution Scholarly Press/Rowman and Littlefield Publishers). Parts of chapter 3 appear in Ragnhild Brøvig-Hanssen and Anne Danielsen (2013): "The Naturalised and the Surreal: Changes in the Perception of Popular Music Sound," *Organised Sound* 18/1, pp. 71–80. Parts of chapter 5 appear in Ragnhild Brøvig-Hanssen (2010): "Opaque Mediation. The Cut-and-Paste Groove in DJ Food's 'Break,'" in *Musical Rhythm in the Age of Digital Reproduction*, ed. Anne Danielsen, pp. 159–75 (Farnham, Surrey: Ashgate). Parts of chapter 6 appear in Ragnhild Brøvig-Hanssen and Paul Harkins (2012): "Contextual Incongruity and Musical Congruity: The Aesthetics and Humour in Mash-Ups," *Popular Music* 31/1, pp. 87–104. Moreover, drafts of this thesis have been presented at conferences organized by the research project "Rhythm in the Age of Digital Reproduction," "Art of Record Production" conferences, and the conferences of IASPM. I want to thank the organizers and audiences of the conference sessions, and the editors, publishers, and anonymous reviewers of these books and journals, for providing me with valuable feedback as well.

Lastly, I want to express my profound appreciation to my family and friends for their steadfast and unflagging support, and for always being there for me. Very special thanks go to my husband, Henning, first of all for his presence but also for being my greatest discussion partner and for lending me his musical ear and analytical and critical skills. I'm also most grateful to my daughter, Hedvig, for helping me not to disappear in my research.

RBH

Oslo, 14 December 2012

Chapter 1

Introduction

A message appears on my iPhone: a package awaits me at the post office. I rush down to find a rare bootleg CD of *The Grey Album* by American producer Danger Mouse (aka Brian Burton). I bought the album on eBay from someone who managed to acquire it in 2004, when the limited edition of three thousand copies was released. The album has since become legendary, partly because of the music's conceptual and aesthetic appeal, and partly because of the album's political consequences. *The Grey Album* combines unauthorized samples from the Beatles' untitled 1968 Capitol release commonly known as *The White Album*—and the a capella tracks from Jay-Z's *The Black Album* (2003, Roc-a-Fella). (The alternate version of *The Black Album* was released by Roc-a-Fella as an invitation to remix and reuse Jay-Z's tracks.) Although the three thousand pressed copies of *The Grey Album* were intended to be promotion demos or limited-edition collector's items, the Internet intervened, distributing the project far and wide as it circulated through cyberspace. Because Danger Mouse had not sought permission for the Beatles samples, the owners of the band's sound recordings in the United States, Capitol Records, required that Burton withdraw his music from the Internet, which he did. However, the copyright activist organization Downhill Battle took up the cause as part of their campaign for free file-sharing by arranging "Grey Tuesday," in which approximately 170 websites made the album available as a free download, which enabled the digital distribution of the album to continue.[1]

This Danger Mouse release, which is referred to as a mash-up album, represents the stereotypical narrative of the digital age of music and recording practices: the "amateur bedroom producer" downloads pre-existing music from the Internet via a peer-to-peer network, deconstructs and remixes the music in a computer-based DAW[2]

[1] Downhill Battle, which was founded in 2003 and still exists, is a nonprofit organization that encourages what members call "participatory culture," including file sharing (see downhillbattle.org [12.16.12]).

[2] "DAW" stands for Digital Audio Workstation, a software recording workstation that runs on computers and that have the possibility of audio and MIDI-interface hardware. According to

program, and distributes and promotes the new version through Internet file-sharing sites from which fans download it, undermining the music industry and short-circuiting copyright laws.[3]

As part of this digital community, I already have the album downloaded as MP3 files, so what I hear when I insert the CD into my stereo is nothing new, but it still "kicks butt," as Susan McClary and Robert Walser once put it.[4] Whereas Jay-Z's vocals are left alone, the sampled material from the Beatles is thoroughly manipulated and rearranged, resulting in an impressive piece of work that is sonically marked by cut-ups. The sounds of each excerpted clip are often recombined into melodies that are not found in either of the original recordings, structured in equally unfamiliar rhythmic patterns. Some of the clips are quite long, and thus recognizable, while others are too short to be identifiable. The hip-hop rhythms of the drums are, according to Danger Mouse, all extracted from *The White Album*, cut into small units and rearranged into beats that support the rapping of Jay-Z. Unlike the Beatles samples that account for the melodies and harmonies of the mash-ups, the drum samples do not bear traces of their origin as cut-ups, or even of being sampled at all. What I find fascinating within this music is the bizarre and disjointed melody lines and harmonic progressions that derive from (and sound in tandem with) the catchy, obviously coherent melodies and chord formulas of the Beatles; the contrast between musical flow and musical disrupter, such as, for example, abrupt vocal lines and stuttering sentences in relation to the persistent rap vocal and steady drumbeat; and the contrast between exposed acts of technological mediation and sounds from traditional instruments—that is, the music's perpetual negotiation among different layers of sound and between traditional and new musical expressions.

In order to grasp what it is that captures our attention and triggers our reactions (which are often extreme) when listening to this kind of music, it is not enough to point to the traditional musical parameters of lyrics, melody, harmony and rhythm.

Michael Serazio, Danger Mouse used Sony's DAW program ACID Pro when producing *The Grey Album* (Serazio, 2008: 85).

[3] The reality is, of course, rather more complex than this stereotypical narrative admits. For example, the new digital models of music production and consumption have not overtaken but instead come to coexist with the traditional large-scale corporate models of the industry (see Hesmondhalgh, 2005: 171). Moreover, as Paul Théberge points out, it has become increasingly difficult to distinguish between the categories of "professional"/"commercial" studio and "personal"/"home" studio (Théberge, 2012: 83).

[4] McClary and Walser, 1990: 290. They refer to the phrase in the context of a *Bloom County* comic strip by Berke Breathed.

Here we must go to an alternative source: the music's particular modes of technological mediation.

The introduction of digital technology has affected how popular music is produced, including where, when, and by whom it is made, as well as how it is distributed and acquired. The development of computer-based, specialized music-editing sequencer programs that encompass software instruments and processing effects, together with the always decreasing price of ever more powerful computer hardware, has allowed all sorts of people to make music without spending hours in a sophisticated music studio or buying expensive musical equipment (because sound sources and musical instruments now exist as software applications). Consequently, the control and power of the professionals and their studio structures have been decentralized by an amorphous figure whom Paul Théberge labels the "singer-songwriter-producer-engineer-musician-sound designer."[5] In addition to its impact upon the *means* of producing popular music, digital technology has also affected its very aesthetics. Throughout popular music's history, technological mediation has been imperative to its production.[6] Sometimes the sonic imprints of technological mediation are obvious to the listener; other times it affects the sound without being perceived as such. In either case, though, mediating technology is hugely important to musical expression, and new developments in technology have an immediate impact on the art form. Digital technology, then, is no exception. In this thesis, I attempt to elucidate how technological mediation in general, and digital mediation in particular, contributes to the aesthetics of popular music.

I am particularly interested in discussing how the digitalization of technology has affected the audible result of the popular music production process. I call these aspects the *signatures* of digital mediation, meaning that the audible information in the music bears traces of its origins in processes that involve digital music

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[5] Théberge, 1997: 221–22.

[6] In classical music, folk, and jazz, the recording medium has traditionally had a documentary function, in that its main purpose has been to freeze a given live performance (of course, as scholars such as Timothy Day and Colin Symes have pointed out, the recording medium is neither neutral nor objective in this regard; see Day, 2000 and Symes, 2004.). Popular music has, on the other hand, been virtually determined by recording technology in terms of its production, distribution and consumption—as Allan F. Moore and Theodore Gracyk, among others, have pointed out, the recording is popular music's "primary text" or "primary medium" (Moore, 2001: 34–35; Gracyk, 1996: 21).

technology. Put differently, *digital signatures* are constituted by the sonically distinctive character of digital mediation. I intend to examine how the new sounds and production techniques offered or encouraged by digital technology have been explored and exploited by producers and musicians in ways that broaden the compositional palette of popular music. I am also very interested in how digital mediation is able to generate unique musical meaning.

Summing up, I will ask the following question: *How has the digitalization of technology affected the aesthetics of popular music productions?* I will compose my eventual answers via three sub-questions:

1. What are the signatures of digital mediation?
2. How has the aesthetic potential of digital mediation been explored in the making of popular music?
3. How do the digital signatures of mediation contribute to the meaning of the music?

The title of my thesis, "Music in Bits and Bits of Music," reflects my notion that the digitalization of technology (which has turned music into binary digits, or "bits") has first facilitated and then encouraged music makers to think about music as comprised of isolated fragments that can, in this nondestructive editable environment, be easily shuffled within or between mixes. And as the music makers' fascination with the aesthetic potential of the endlessly convertible *music in bits* has grown, the listener too has learned to appreciate these mixes consisting of spatiotemporally disjunctive *bits of music*.

In the present chapter, I will first account for the methodology that I have chosen as a means of answering these questions—namely, interpretative music analysis. I will outline the particular signatures of digital mediation that I will focus on (this thesis cannot be exhaustive in this regard) and explain my choices of music to exemplify how these signatures have been explored, as well as articulate some of the issues involved with analyzing how music is experienced. I will also explain my reasons for focusing on recordings rather than live performances or music videos, and for taking an interdisciplinary approach to the literary resources that inform my approach. I will then clarify my position regarding the relationship between technology and consumption. I will present definitions for some of the terms that will

be important throughout my thesis, including especially "mediation" and my own related notions, "opaque mediation" and "transparent mediation." Finally, before presenting the outline of my thesis, I will position its contribution within the field of popular music studies and present some of the academic resources that have been pertinent to it.

Methodology

In order to answer the main research questions of this thesis—*how has the digitalization of technology affected the aesthetics of popular music productions*—I have found it more relevant to conduct music analyses within the academic tradition of subjective interpretative hermeneutics than to pursue an anthropological field study that would encompass interviews with producers (on how their compositional habits have changed, for example) and listeners (on how they experience the changes within the music). Music analyses, first of all, present an opportunity to generate a more nuanced and detailed account of the technological mediation of the music than a field study would, and with regard to the present research questions, details matter. This choice of method, of course, demands that I am on the *inside* of the culture I am examining, in the sense that I am both familiar with the production techniques in question and familiar with the finished product in the marketplace. In this way I am able to function as informant as well as agent.

When it comes to the question of how the *digitalization* of technology has affected the aesthetics of popular music production, I will of course focus upon particular sonic aspects in the music that are characteristic for digital technology—that is, the *digital signatures* of mediation. Space precludes the examination of the whole field of digital signatures in the present thesis. For example, I will not discuss the change from analog to digital instruments or drum machines, or the characteristic digital signatures of the AutoTune pitch correction effect,[7] or the possibility of quantizing rhythms digitally.[8] I also touch only briefly upon the changes brought

[7] AutoTune is an audio-signal processing effect that is able to reconcile flat or sharp tones to a precise and clear pitch level. Cher's major 1998 hit "Believe" (Warner Bros.)—one of the bestselling singles of all time—inspired a wave of music exposing the use of this tool (whose distinctive digital signature is now often referred to as the "Cher effect"). In "Believe" (in which the AutoTune's "retune" speed is set to zero), both the natural vibration of the voice's sustaining tones and the natural sliding transition between the voice's different tones are eliminated, which makes the vocal performance sound almost mechanical.

[8] Most digital sequencers have the ability to automatically quantize the rhythms performed by MIDI instruments, which means that the MIDI signals will be adjusted to certain precise

about by the MIDI system in general. In the next chapter, however, I will briefly summarize the historical development of some of the chief digital attributions that are relevant to this thesis.

The first signature I will examine is the digital signal processing (DSP) effects of reverb and delay, and the second is the characteristic digital silence. The third signature is the virtual cut-and-paste editing tool, which is closely connected to the fourth signature, "malfunctioning" digital technology. The last signature is music recycling as it occurs in the digital format. Instead of focusing on the sampler instrument alone, I will discuss the practice of music recycling in terms of the computer-based DAW programs as well. Any engagement with these various digital signatures presupposes considerable knowledge about how digital mediation works and in particular how its functions and constraints differ from pre-digital mediation. I will therefore situate the digital signatures I discuss in a historical perspective by relating them to similar signatures offered by pre-digital music devices.

When it comes to exploring how the aesthetic potential of digital mediation has been explored in the making of popular music, I have chosen four main tracks as my case studies, based upon my interest in highlighting the different forms of digital signatures that I want to explore. In other words, I privileged music in which a given digital technology was both experimented with and exposed. In addition to representing different digital signatures, the selected tracks also represent important respective stages in the development of digital music devices and practices. Digital delay was introduced to the commercial music market in the mid-1970s, and digital reverb, which has a much more complex design, came in the late 1970s and early 1980s. When these effects were new, they were often subjected to radical experimentation, and I found a particularly compelling example of this from the early 1980s with Kate Bush's "Get Out of My House" (*The Dreaming*, EMI Music Distribution) from 1982. Portishead's "Strangers" (*Dummy*, Go! Discs/London) from 1994 will illustrate my discussion of the signature of the digital medium's characteristic silence; while digital silence accompanied the earliest digital interventions, the 1990s saw a markedly ambivalent countercultural reaction to this silence, and Portishead is particularly interesting in this regard. The band took part in this countercultural movement by revisiting old music equipment *but also* embraced

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categories dictated by the user, such as aligning the rhythms to exact points on the sequencer's timing grid.

digital mediation, encouraging us to hear both the lo-fi sounds of pre-digital technologies *and* the silence and hi-fi signature of digital mediation anew. I will address the signature of the digital cut-and-paste tool through an analysis of DJ Food's "Break" (*Kaleidoscope*, Ninja Tune) from 2000. During the latter half of the 1990s and the early 2000s, affordable full-functioning DAW sequencer programs rapidly became an obligatory prerequisite not only for professional producers but also for amateurs, as the price of powerful computers and sequencer programs went down. These sequencer programs facilitated several editing operations, including cut-and-paste. DJ Food's experimentation with this tool in "Break" might be heard as mimicking the skipping sounds of glitching computers or CDs, and "Break" thus also exemplifies the fourth digital signature that I addressed above—that of malfunctioning digital technology. The last digital signature that I will discuss—the signature of digital music recycling—will be explored through an analysis of the musical mash-up "Psychosocial Baby" (*Mashup Manifesto*) by Isosine (aka Steven Nguyen), which was released as an Internet bootleg in June 2011. Mash-up music, which developed into a discrete style in the early 2000s, consummates the impact of new technologies upon the existing practice of music recycling—both computer-based sequencer programs and the Internet itself were vital to the proliferation of this style.

These four musical tracks were chosen first and foremost because they illustrate in different ways the points I want to make, but also because I find them interesting and aesthetically appealing (in different ways). They can all be placed somewhere within or among the categories of pop, rock, electronica, and hip-hop, and they are all situated within the Anglo-American popular music scene. In this thesis, I have not been particularly concerned with the fact that the digitalization of technology has affected different genres of popular music in different ways; while some genres have embraced the new opportunities, others continue to produce music more or less in the same way as before the introduction of digital technology. Instead, I have identified three different recording paradigms (see chapter 2) that exist both between and across genres.

My view that music cannot be separated from the experience of it led me to my thesis question concerning how the digital signatures of mediation affect the perception of the music (and its mediation), and how digital mediation contributes to the meaning of the music. A prevailing perspective within popular music studies is

that the experience of music is socially and historically constituted; listening is not fixed. Adorno proclaimed the connection already in the 1920s, though it did not saturate the practice of music analysis until the 1970s and onward (I will return to this crucial wave of critical/new musicology below). Some scholars, in light of the perceived self-evidence of this perspective, dismissed music analysis altogether.[9] Others used this insight to improve upon their methodology according to the fundamental view that "musical meaning cannot be detached from the discursive, social and institutional frameworks which surround, mediate, and (yes) produce it," to borrow from Middleton.[10] In the present thesis, then, in addition to asking "'*what* is being communicated' and 'how,'"[11] as Philip Tagg once described the task of music analysis, I will ask *why* the music is experienced the way it is.

While I sometimes discuss alternative interpretations in my analysis, I generally begin with my own readings of the music and proceed by analyzing my analyses. Why do I respond to the music the way I do? While other listeners may perceive the mediation differently, I hope nonetheless that my music analyses (and my analyses of the music analyses) will contribute to a broader understanding of the cultural currency of contemporary popular music and its technological mediation. Having produced music using various computer-based DAW programs since I was fourteen years old (I started in 1995, not long after the DAW was introduced to the market), it is likely that I listen more for technical details or techniques of production than listeners without hands-on experience. However, even those who might not recognize the "cutting and pasting" that has gone on in a particular music track will still experience it as manipulated or temporally fragmented. While I do not assume a level of competence in the listener that matches my own expertise, I do believe that we can have a conversation—that is, that the immediate experiential effects of music can be productively subjected to examination. It is the music scholar's task to try to explain *how* music is able to give rise to diverse experiential responses, and to do so with a minimum of jargon or tangled narrative webs. As Allan F. Moore stresses, music is not magic (although the experience of it might be).[12]

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[9] For a discussion of this consequence, see, for example, Middleton, 2003: 7.
[10] Middleton, 2003: 9.
[11] Tagg, 1982: 65.
[12] Moore, 2003: 7.

Of particular interest to this discussion, of course, is the specific question of how the technological *mediation* of the music is experienced. I am not primarily concerned with whether or why the technology is experienced as *authentic*, though I will pay some attention to the relationship between technology and authenticity in chapter 2 and chapter 7. Instead, I am more concerned with how the mediation is perceived in the first place, and how it contributes, authentically or otherwise, to the musical meaning. Implicit in this task is an inquiry into why we experience certain sounds as mediation in the first place when others fail to register them as such. Later in this chapter I will introduce my notions of "opaque" and "transparent" mediation, which imply that we experience some forms of mediation as exposed and others as discreet (two qualities I will revisit throughout this thesis). Likewise, I am interested in why we experience some forms of mediation as part of the music and others as merely affecting, or even interfering with, the music. Relevant to both of these discussions is the fact that the experience of the mediation as opaque or transparent, and as intramusical or extramusical (I will return to these terms later in this chapter), is determined by the context as well as the music. For instance, since spatiotemporally fragmented music is a relatively new musical form, it tends to prompt an unconscious comparison between what we hear and what we are accustomed to hearing—the traditional, spatiotemporally coherent musical performance. This "historical orientation" pushes back against the notion of perceptual tuning, or what I will refer to as the *tuning of the ear*—that is, the tendency to gradually naturalize new sonic expressions.[13] Consequently, spatiotemporally fragmented music evokes our familiarity with its component parts (and the tradition from which they emerged) while subverting them in turn. This perspective will inform all of the chapters here and return in force in my conclusion. In my discussions of the perception of mediation, the ecological perspectives and theories of scholars such as James J. Gibson, Eric F. Clarke, Marc Leman, Albert S. Bregman, and Barry Traux have been greatly inspiring. This thesis is, however, not a psychoacoustic study. While it would be interesting to focus on the affect of cognitive and perceptual mechanisms upon

[13] I want to thank *Organised Sound*'s anonymous reviewer of the article "The Naturalised and the Surreal: Changes in the Perception of Popular Music Sound" (forthcoming), which I co-wrote with Anne Danielsen, for referring to our discussion of processes of naturalization as "the tuning of the audience's ear," a formulation I have adopted in this thesis.

how mediation is conceived, here I will turn mainly to theories based in the hermeneutic tradition, and particularly to contributions from popular music studies.

When analyzing the music, I generally do not transcribe what I hear, because much of what I am interested in cannot be captured by the notational system anyway. However, at certain points in the thesis, transcriptions complement my descriptions of the music quite well. When discussing Portishead's music, a spectrogram from Amadeus Pro illustrates the contrast between sound and complete digital silence, and when discussing the cut-and-paste music of DJ Food, I draw upon the graphical representation of the track's sound-signal amplitudes, as displayed in my DAW program Logic Pro, to present both the original track and my reconstruction of its mediating operations. Most of the analyses, however, rely upon written descriptions of what I hear, using both technical and non-technical terms in a fashion best suited to generally interested but music-technologically disinclined listeners.

While mediating technology is very important to live musical performances, I will focus on recordings alone. This allows me to listen to the same track over and over, pause the music, rewind it, and insert it in my DAW program in order to zoom in on the graphic representation of its sound waves. Moreover, the reader can listen to the same recordings, and hopefully will, since a musical description in words will never entirely reconstruct the experience of listening to the music itself. While I will not analyze particular live performances, then, I will in the next chapter discuss, on a general level, their relationship to recordings, in terms of how it has changed through history. Since my focus in this thesis is on recordings, the videos of the music tracks I analyze will, with one exception, not be taken into account. While DJ Food's "Break" does not even have a video, the video of Portishead's "Strangers" is in fact from a live concert at the Roseland Ballroom in New York City in 1997, in which they performed rearranged versions of their music with New York Philharmonic. The more artistic (that is, less documentary) video for Kate Bush's "Get Out of My House" often visualizes its lyrics, and its sound/image synchronization adds new meanings to an already compelling musical resource. Yet those new visualized meanings of "Get Out of My House" undermine rather than emphasize my own interpretation of the musical spatiality created by the aural effects of mediation with which I am chiefly concerned. I will, however, discuss the featuring video of Isosine's mash-up "Psychosocial Baby," mainly because the primary distribution channel for this track is the audiovisual Internet platform YouTube—the track is a bootleg and therefore cannot

be purchased at a record store—so the music and the video are usually experienced as a unified piece. Moreover, this video contributes to the meaning of the music in such a significant way that the two are difficult to separate.

In *Rethinking Music* (1999), Nicholas Cook and Mark Everist decide that "no final, universally applicable decision on the matter [of methodology] is possible or even desirable,"[14] a stance that is prevalent within the field of popular music studies. Rather than adhering to a singular core methodology, popular music scholars have cultivated the art of drawing upon a whole range of fields of study in order to detect and process music's diverse meanings. The present thesis endorses this position: in addition to a considerable body of works within the fields of popular music studies as well as ethnomusicology, it relies upon sources from a variety of fields, including history, electro-acoustic and avant-garde studies, psychology, philosophy, literature studies, cultural and media studies, performance studies, and art studies. As a further case in point regarding the value of an interdisciplinary orientation, I will call out Linda Hutcheon's works on irony, parody, postmodern theory, and adaptations, which have exerted a profound influence upon my arguments throughout this thesis. Though there is not always a direct link between her theories and mine, I treasure her insight that binary oppositions need not either merge or cancel each other out but instead might coexist as "both and neither." Other scholars that have been particularly important to my study will be referred to later in this chapter, or in the succeeding chapters.

Lastly, given the fact that the activity of music making has now transcended the distinctions between composer, musician, performer, producer, and sound engineer, I sometimes use "music maker" to refer to the "all-in-one figure"[15] (or figures) responsible for the given audible result. Other times, I retain the established terms "producer" and "musician," though I believe that the producer is indeed also a musician. Moreover, given that I analyze music recordings, I will refer to the music-analytical material as "tracks," drawing upon Albin J. Zak III's helpful distinction: "The song is what can be represented on a lead sheet," while "the track is the recording itself."[16]

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[14] Cook and Everist, 1999: xi.
[15] Moorefield, 2005: xvii.
[16] Zak, 2001: 24. For a discussion of the difference between "song" and "track," see also Moore, 2010.

A Digital Revolution?

In suggesting that the digitalization of technology has profoundly affected the aesthetics of popular music production, I am not thereby fomenting a "digital revolution" along the very lines cautioned against by Nick Prior: "How does one avoid the overly uncritical and exuberant embracing of all things digital as revolutionary and transformative without suggesting that nothing has changed at all?"[17] In fact, I would hasten to point out that digital technology has actually offered relatively few operations that are entirely *new*. And yet, because digitally converted sounds can be treated differently than analog sounds, this technology has clearly affected how we treat the sounds—the digitalization of reverb, delay, cut-and-paste operations, and music recycling has changed the approach to these pre-digital technologies and practices. In a sense, the digitalization of technology has *materialized* musical space and time via numerical information that can be mathematically manipulated; moreover, the graphical interface of the modern digital audio sequencer program has transformed the audible sounds of music into visible blocks that can be manipulated, rearranged and juxtaposed in a non-destructive, editable environment. Throughout this thesis, in fact, I will explore the ways in which the digitalization of technology has encouraged the tendency to think of music as consisting of bits and pieces that can be detached from their spatiotemporal origins. I will also explore how this tendency, in turn, has fueled an experimental approach to music making when it comes to treating space and time as musical parameters. It did not introduce this approach: technological experimentations with music's spatiotemporal form dates back to the phonograph era, when, despite the fact that this technology offered few "official" manipulation options, experimental composers such as Darius Milhaud, Paul Hindemith, Edgard Varèse, and John Cage were already distorting phonographic discs using variable-speed turntables.[18] Others were experimenting with overdubs, or mangling the grooves of the vinyl disc, or pasting objects on its surface, or even gluing cut-up quarters of different vinyl discs together, resulting in extremely "untraditional" performances (I will return to this era in later chapters). However, experimentation with music's spatiotemporal structure has been

[17] Prior, 2009: 82.
[18] Chanan, 2000: 140. For instance, in 1939, Cage premiered his *Imaginary Landscape No. 1*, a composition for muted piano, cymbal, and two phonographs, in which two performers varied the speeds of their sound discs on the turntables (ibid.).

taken even further via the digital medium, which offers more convenient means of releasing music from the spatiotemporal coherence by which it once was constrained.

Despite the obvious affects of digitalization upon popular music production, I do not promote a deterministic view of technology and in fact dispute Marshal McLuhan's famous claim that "the medium is the message," in the sense, at least, that technology, in a *determinate* way, constrains how we act or think in response to it.[19] Still, though I do not regard the consumers of these technologies as either passive or overly impressionable, I agree with McLuhan that technological artifacts can affect one's mindset, and that they tend to further certain operations at the expense of others. The notion that technology fundamentally impacts society, which McLuhan claims, has been questioned by the social constructivist idea that technological artifacts are relatively neutral tools that are socially shaped. We are here confronted with the enduring debate about whether worldly objects have inherent properties (realism) or whether the "reality" of these objects is the result of social factors and processes (constructivism). Keith Grint and Steve Woolgar sum up the debate as follows: "Does technology . . . determine, or is it determined by, the social?"[20] I take a position similar to that of Ian Hutchby, who argues that technology does both. Instead of seeing specific technologies in terms of their "interpretive textual" properties or their "essential technical" properties, Hutchby sees them in terms of their *affordances*, drawing on the theories of James J. Gibson. Affordances are the possibilities that a given technology offers to the consumer, in terms of enabling as well as *constraining* particular functions. Of course, as Gibson stresses when he introduces the term, "an affordance cannot be measured as we measure in physics."[21] For one thing, it is relational: it may offer one function to one group of consumers but not to another. It might also offer one function in one context but not in another context. However, though an object's affordances might differ in these ways, they are not *freely* variable—there are things, in short, that an object does *not* afford, no matter what. In addition, the fact that an object's range of affordances is not fully and immediately available to perception does not mean that the object does not possess them; as Gibson explains, "The *affordance* of something is assumed *not* to change as the need

[19] McLuhan, 2001; the book was first published in 1964.
[20] Grint and Woolgar, 1997: 21.
[21] Gibson, 1986: 128; the book was first published in 1979.

of the observer changes."[22] Thus, technologies are not empty or "open forms," as the radical constructivist position suggests, and they are not determinate, because a technological artifact might afford different things to different consumers. Hutchby's view of technological artifacts as in possession of different affordances for different consumers will inform my discussions of the effect of the digitalization of technology on the aesthetics of popular music production, as well as my discussions about how the mediation is experienced (as opaque or transparent, for example).

In the next chapter, I will describe the way in which digital technology possesses particular functions that frame, but do not determine, how music is produced. I will also demonstrate, however, how consumers have always approached new technologies, and new technological opportunities, in very different ways. As Hutchby points out: "Although there may be ways that technology-texts have 'preferred' readings built into them, it is always open to the user to find a way around this attempt at interpretive closure."[23] While digital technology arguably facilitates certain new operations, many music makers continue to use it as they did its predecessors. The position I take here thus complies with the argument that concludes Hutchby's article "Technologies, Texts, and Affordances" (2001): "Technological artefacts do not amount simply to what their users make of them; what is made of them is accomplished in the interface between human aims and the artefact's affordances."[24]

Opaque and Transparent Mediation

In the present study, "mediation" functions as a comprehensive generic term for the technological mediation that happens within the production process of music—that is, the processes of recording, editing, and treating sounds with various signal-processing effects. The Latin *mediates*—the etymological source of the verb "to mediate"—means "to be placed in the middle," which tells us that mediation forms a link between two different things, people or phenomena. "Mediation," thus, has a variety of applications, but here I will reserve it for the process of technological transmission of sound from a source, through a material medium, to a (potential) receiver. While most forms of mediation conform to William J. Thomas Mitchell's argument that "the

[22] Gibson, 1982: 409. Emphasis in the original.
[23] Hutchby, 2001: 445.
[24] Hutchby, 2001: 453.

medium does not lie between sender and receiver; it includes and constitutes them,"[25] the medium involved in this form of mediation (the processes of sound transmission) actually *does* lie between sender and receiver.[26]

Music, in fact, is utterly dependent upon various mediating processes (of transmission through a material medium) in order to be heard or even to come into being at all. For instance, a given guitar sound might have undergone the following stages of mediation: after being brought to life through the vibration of the guitar strings, it is first mediated (and affected) by the acoustic guitar's body, then by the environmental space in which it occurs. It might then be electronically mediated by a microphone, and possibly a compressor. If it is destined for a recording, it will be further mediated by a mixing console, a sound card (which involves the mediation of a preamplifier and an analog-to-digital converter), then by a computer, and then by processing effects and editing tools. Ultimately, it will be mediated by a certain phonogram (such as LP, CD, cassette, mp3 file, and so on). Before the consumer can actually hear it again, however, it must be further mediated by a playback device, and by speakers, and by the environmental space in which the speakers are placed. While it is difficult to outline the ontological differences among these stages of mediation, I have identified three commonly acknowledged categories: (1) mediation that is seen to constitute the sound's formation, or its identity (the voice as it sounds directly from the singer or the "unplugged" output of traditional instruments, for example); (2) mediation that is seen as not belonging to the *sound's* identity but still belonging to the *music's* identity (which often includes instrument amplifiers, processing effects, editing tools, and so on); and (3) mediation that is not seen as belonging to the sound or to the music's identity but that still influences the sounds (a category typically

[25] Mitchell, 2005: 204.

[26] The term "mediation" is usually meant to signify either (1) the process of intervening or negotiating in a dispute in order to bring about an agreement or reconciliation (see Born, 2005, and Latour, 1993, for examples of mediation used in this sense), or (2) an intermediary process realized through a medium or instrument of transmission. The latter meaning of "mediation" indicates two further subcategories relating to either the process of interacting or the act of conveying. Mediation as interaction indicates a two-way process of communication or affection (see Couldry, 2008; DeNora, 2000, 2003; and Hennion, 1995, 2003, for examples of mediation used in this sense), while mediation as conveyance indicates the transmission of something from a source to a receiver, or from one place to another. The latter form of mediation might involve physical transmission of something through a material medium (such as the processes of sound transmission or the physical transportation of contaminants through water), or it might involve communicating something through representations, such as semantic meanings mediated by alphabetic letters or images mediated by paintings.

encompassing file formats, phonograms, playback devices, and so on—that is, mediation applied after the music is "mastered"). These three categories of mediation are relatively "permanent," meaning that most of us implicitly and unconsciously distinguish among them all the time.[27] However, when listening to music, we do not always register the mediation involved *as mediation*, but simply regard it as part of a sound's original identity. In contrast to categories 2 and 3, which are conceptualized as mediation, the first category is simply thought of as "sound," even though it already depends upon several mediating operations. I will label the second category "intramusical mediation," because the mediation involved is regarded as happening within the music, or as part of the music—that is, as the music's *interior*. I will then label the contrasting third category "extramusical mediation," because, although the mediation still affects the sounds, it is not regarded as part of the music but as the music's *exterior*.[28] As already mentioned, I am in this thesis concerned with intramusical mediation, and, more precisely, with the mediation that happens within the production process of music.

While mediation is ubiquitous in popular music, we only conceive of certain instances of it as such, as mentioned above. This notion has led me to my distinction between "opaque" and "transparent" mediation. In coining these terms, I have been inspired by the French philosopher Louis Marin, who applies the same notions to painting and semiotics (I have particularly benefited from his articles "Opacity and Transparence in Pictorial Representation" [1991] and "Mimesis and Description" [2001, first published in 1988]).[29] I later discovered that my use of these terms also has much in common with their application by Jay David Bolter and Richard Grusin

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[27] The second category is, however, vulnerable to the criticism that what is outside the sound's identity should never be considered "part" of the music. This perspective typically arises alongside a view of the recording device as a medium solely devoted to *documenting* the music (as in certain milieus of classical music). In any case, I propose a relevant distinction between categories 2 and 3 as alternative forms of *extramusical* mediation, if category 2 is not regarded as *intramusical*.

[28] "Intramusical mediation" and "extramusical mediation" must not be confused with what Serge Lacasse labels "intramusical relations" and "extramusical significations," although these terms are, of course, related (Lacasse, 2000: 18–19). While my terms refer to whether the mediation in question is located within the production process of music or outside of it, Lacasse's terms refer to whether the vocal staging effects—that is, "any deliberate practice whose aim is to enhance a vocal sound" (Lacasse, 2000: 4)—act on other musical parameters within the mix ("intramusical relations") or on the listener by providing various connotations ("extramusical significations").

[29] Louis Marin (1931–1985) is known for his works in the fields of philosophy, linguistics, semiotics, rhetoric, literary theory, theology, anthropology, art and institutional history.

to visual media in *Remediation: Understanding New Media* (2000). I will first clarify my own use of the terms before I explain how my notions relate to, and at certain points differ from, those of Marin and Bolter and Grusin.

"Opacity" and "transparency" are useful for explaining the experiential aspect of the various modes of the mediation involved: transparent mediation implies that the listener ignores the mediation, while opaque mediation implies that the listener reckons with it.[30] Technological mediation is almost always involved in the production of popular music, but its presence, as we have discussed already, is evident to greater and lesser degrees. Put differently, the editing operations and processing tools are there whether we notice them or not, and when we do not, it is because we perceive the technological mediation as *transparent*, not because there is none. Similarly, when we *do* notice those operations, it is not because there are more of them than usual but because we perceive the technological mediation as *opaque*. In this way, ultimately, the notions of opaque and transparent mediation help to clarify that what is usually at stake is not whether the music is unmediated or mediated, or how much mediation is involved, but rather how the mediation involved in the music is *perceived*.

Although I have found it necessary to reconstruct a dichotomous relationship (opaque versus transparent) in an attempt to deconstruct a binary (mediated versus unmediated), the mediation's opacity always goes hand-in-hand with its transparency. That is, opacity does not lack transparency but functions as a filter that obscures it or renders it incomplete. When we perceive the mediation as opaque, then, we understand it to be interfering with or manipulating something else. We do not *only* focus on the mediation—that is, its self-presentation—but also on what it mediates. Transparent mediation, on the other hand, lacks opaqueness, but this does not mean that the mediation is absent. Louis Marin illustrates this condition with a metaphor:

> To be at the same time present and absent is a good visual and conceptual definition of a transparent thing, a glass pane through which I look at the landscape beyond. If there are scratches on it, or stains or blotches, I suddenly see the window pane instead of the garden, its lawn and its trees.[31]

[30] For further discussion of the notions of "transparent mediation" and "opaque mediation," see Brøvig-Hanssen, 2010.
[31] Marin, 1991: 57.

Once the listener is focusing on the mediation's self-presentation, the transparency of the mediation transforms into opacity.

While "opaque" and "transparent" mediation are perceptual categories, they also signal divergent aesthetic paradigms in operation in the production process of music, as we can see in the different ways in which the cut-and-paste tool is used in popular music recordings. Today, almost all recorded music involves extensive use of this tool, although this is not always recognized as such. If the production ideal is transparent mediation, the tracks are often cut up during silences and the joins are smooth and inaudible, so that the sonic result is a temporal continuity rather than a fragmented constellation. If the production ideal is opaque mediation, sounds might be cut abruptly (or midstream) and the joins are rough or otherwise obvious, resulting in "jump cuts," for example, or stuttering effects. Here, the aim is to attract the listener to the act of mediation itself, *in tandem with* that which is mediated (the exposure of the cut-and-paste tool will be discussed thoroughly in chapter 5). (Of course, the experience of mediation as opaque can be unintentional as well—the result of producer incompetence or disinclination, for example.)

The reason for developing these notions at such length lies in my interest in the many ways we listen, and specifically in the fact that some of us focus on some forms of mediation rather than others, and that others might ignore those same forms, and that all of this could change over periods of time that range from minutes to decades or more. For instance, when the microphone was introduced in the mid 1920s, singers soon exploited the microphone's capacity for mediation as a personal instrument of sorts, developing new vocal styles such as "crooning," which emphasizes the uniquely public intimacy of the amplified voice.[32] While this use of the voice simply mimics in a musical context the way people hear the voice in unmusical contexts (face-to-face conversations, for example), it was at first regarded as a profoundly opaque mediation, since the intimate voice had never before been able to penetrate in a concert hall. This familiar-made-unfamiliar vocal sound did not correspond to the singer's spatial location either; though the vocalist sang from a stage in a concert hall, far away from the listener, it sounded as if he or she was sitting right next to the

[32] Chanan writes: "Crooning is more than a technique, but a style, modeled on the intonation and phrasing of certain jazz singers, typically sliding up to notes than hitting them square, and with a sensual, ululating tone that comes from deep in the throat" (Chanan, 2000: 68). Some of the first crooners were Rudy Vallee, Bing Crosby, Perry Como, and Frank Sinatra.

listener. Of course, as listeners grew accustomed to such live performances, the microphone-staged voice gradually came to stand for the musical voice itself.[33] Therefore, the technological mediation grew increasingly transparent, in the sense that, perceptually, it passed by the listener unnoticed. We also see a reverse tendency, as I will discuss further in chapter 4; with the introduction of the digital recording/production and playback medium, the sonic imprints of pre-digital technologies, such as tape hiss and vinyl crackle, were suddenly experienced as more opaque than ever before. Nor is it historical factors only that determine whether we perceive a particular act of mediation as transparent or opaque; standards vary across genres as well. Fans of acoustic jazz may perceive the aggressive use of the compressor as opaque, whereas fans of hip-hop may perceive it as transparent.

Although opacity and transparency are obviously not inherent qualities of music, one's comprehension of mediation as either opaque or transparent is far from arbitrary, as I will demonstrate throughout this thesis. In fact, we usually experience mediation as opaque at those moments when it disturbs our mental imagination of the sound source's "pure" identity (that is, when it crosses the border between "sound" and "intramusical mediation"); when it challenges our notion of what is "extramusical mediation" and what is "intramusical mediation"; and when it disrupts the spatiotemporal coherence of the music. In the end, the mediation draws attention to itself to very different extent depending on both the music and contextual factors. Despite the shifting footing, then, I will in this thesis focus largely upon mediation that *I* perceive as applied *to* the sound while acknowledging the continuing relevance of the alternative (that it is not noticed by other listener).

As mentioned, my notions of "opaque" and "transparent" mediation are inspired by how Marin uses these terms in his discussions of paintings and semiotics. Marin proposes that "to represent" means, in short, to *present oneself* as representing *something else*.[34] He labels the representation's condition of representing something else a "transitive dimension," the effect of which is "transparency," while he labels the representation's *self-presentation* a "reflexive dimension," the effect of which is "opacity." While I have benefited much from these terms, there are certain differences

[33] For a discussion of the development and reception of close-up microphone singing, see Chanan, 2000: 67–70 and 109–10; Frith, 1986: 263–65; Toynbee, 2000: 74–80; and Read and Welch, 1959: 238–39.
[34] Marin, 1991: 60.

that can be traced to the fact that while Marin, as well as Bolter and Grusin, discusses *representations* (which are based on substitutive signs), I discuss technological *mediation* (which is not based on signs in this sense). Whereas in representations, opacity functions as the very means for experiencing the representation as transparent, the opacity of technological mediation within music is specifically *not* a means for experiencing the mediation as transparent. It is to this conundrum that I now turn.

Marin observes that while the poet often strives for a language so transparent to his or her imaginary world that readers feel as if they are witnessing it in the "first person," those readers in fact only have access to that world through the letters of the words—that is, the written signs.[35] These signs (the letters) must be experienced as opaque—they must be *seen*—in order to be experienced in turn as transparent to what they represent—that is, in order to be able to communicate meaning. Similarly, in a pictorial representation, the representation's opacity (the paint and brush strokes, for instance) serves to fulfill its transparency function (in the sense that they represent something else). Marin calls this the "paradox" of the functioning sign: it—the sign or representation—is at the same time present and absent, opaque *and* transparent.[36] Bolter and Grusin apply the concepts of transparency and opacity in a fashion reminiscent of Marin in their descriptions of different forms of "remediation," or "the representation of one medium in another."[37] They first point to the correlation between the consumer's fascination with a mediation's self-presentation and the desire for its effacement. What Marin calls the "paradox" of the functioning sign is related to what Bolter and Grusin call "a double logic of *remediation*": "Our culture wants both to multiply its media and to erase all traces of mediation: ideally, it wants to erase its media in the very act of multiplying them."[38]

The content of a book is only accessible through its words and letters, and the content of a picture is only accessible through its paint and brush strokes, but the

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[35] Marin is not the first philosopher to take up the issue of a representation's self-presentation. For instance, his theory of the representation's reflexive and transitive dimensions has much in common with Derrida's theory of "the Written Being" and "the Being Written." The former is writing in the literal and strict sense, or the "exteriority of the body" (Derrida, 1974: 17), and it is comparable to Marin's reflexive dimension of representation, or the sign's self-presentation. "The Being Written" is, on the other hand, writing in the metaphorical sense, or the "divine inscription in the heart and the soul" (ibid.). It is comparable to Marin's transitive dimension of representation, or the representation's act of rendering something else.

[36] Marin, 1991: 55–56.

[37] Bolter and Grusin, 2000: 45.

[38] Bolter and Grusin, 2000: 5.

content of music, on an experiential level—as an audible phenomenon—is different in this regard. Though we do not have access to sounds except through mediation, we do not need to hear the mediation *as mediation* (that is, to acknowledge it) in order to hear the sounds; sometimes the listener does not notice the mediation at all or associates it with the sounds themselves. Therefore, while Marin (as well as Bolter and Grusin) sees opacity as a means of fulfilling the transparency function, I see musical mediation as experienced as either transparent *or* opaque. I am not saying that visual representation is fundamentally different from musical *representation*; musical meaning is obviously determined by the listener hearing the music. It does, on the other hand, differ from musical *mediation*: in contrast to any form of representation in which the conveyed meaning depends upon the discernment of various forms of signs, we do not need to *hear* the technological mediation, in the case of music, in order to hear the sounds that it conveys.[39]

My notion of "opaque mediation" might evoke Mark Katz's notion of "phonograph effects"—that is, "the manifestations of sound recording's influence," which he introduces in *Capturing Sound: How Technology Has Changed Music* (2004) in his attempt to illuminate how and why production influences music and listeners.[40] In some of his case studies, such as his analysis of "Praise You" by Fatboy Slim, the term "phonograph effect" could in fact be replaced by "opaque mediation," and the same holds true for several of my analyses as well. Yet, there is an important distinction: "phonograph effect" describes *any* influence that technology has had on music and the listener, such as how the three-minute limit of a ten-inch 78-rpm phonograph record dictated (and, following Katz, still impacts) the length of the popular song,[41] or how the mp3 format and P2P network have provided new ways of both disseminating and experiencing music.[42] Opaque mediation, on the other hand, only describes the mediation involved in the musical production that is experienced as

[39] While representation is always a form of mediation (see my definition of mediation in footnote 25), mediation is not necessarily a form of representation: a representation usually means that something absent is substituted for by signs (and requires someone to interpret the signs in order to understand the representation as a representation), whereas mediation might also signify a physical transmission of something through a material medium, such as the processes of sound transmission.
[40] Katz, 2004: 3.
[41] Katz, 2004: 32.
[42] Katz, 2004: 158–87.

exposed. Simply put, all instances of opaque mediation are phonograph effects, but all phonograph effects are not instances of opaque mediation.

"Opaque" and "transparent" mediation might further evoke Denis Smalley's distinction between the "naturalist work" and the "interventionist work":

> At one extreme, a naturalist work unfolds as if "natural," with few seams and ruptures, and a logic of passage; there is a certain transparency in the way things proceed, above all in the care with mixing. With the interventionist approach the composer's hand is in evidence, and the stamp of the technology and techniques is apparent in the kind of material and the way it is manipulated, whereas in the naturalist work there will be some attempt to hide techniques, and avoid exposing technological signifiers.[43]

Although Smalley's "naturalist work" sounds like an example of transparent mediation, and his "interventionist work" sounds quite like opaque mediation, I find his terms to be problematic. First of all, the means of achieving transparent mediation might involve just as much "intervention" as those achieving opaque mediation. Furthermore, in relation to the connotations of the "naturalist work," we must recognize that opaque mediation is experienced as both unnatural and natural, depending upon all of the factors listed above, and therefore, as a qualifier, "natural" has little to recommend it.

As McClary and Walser point out, "Developing methods for getting at those overlooked dimensions [of music] require not only noticing them but also constructing a vocabulary and theoretical models with which to refer to them and to differentiate among them."[44] Hopefully, my constructions of opaque and transparent mediation will demonstrate great heuristic value as flexible tools for explaining how we perceive mediation and negotiating the sheer fluidity of the act of listening to popular music.

Studying Technological Parameters

Stan Hawkins asks, "How far have we come since Joseph Kerman's call for change in the early 1980s?"[45] He is alluding to Kerman's critique of musicological formalism and positivism but also, more generally, to the aftermath of the critical wave that

[43] Smalley, 2007: 54.
[44] McClary and Walser, 1990: 282.
[45] Hawkins, 2012: 2.

swept through musicological institutions in the 1980s and 1990s, often referred to as "critical musicology" (UK) or "new musicology" (USA).[46] Questioning the Western canon's exclusion of music affiliated with particular social groups or communities (such as youths, the working-class, women, and non-Western communities) and particular forms of music (so-called "low" or "light" art), popular music studies has, among other non-canonic genres, over time and with great strides forward, been welcomed into musicological institutions.[47] Initially, music scholars applied the tested methods of the classical canon to the examination of popular music, but this was eventually determined to be too limiting with regard to the new genre's aesthetics and impact. Several scholars have since addressed this problem head-on, pleading the case for new musicological approaches.[48]

One of the things that undermined the academy's approach to popular music was its general neglect of the musical performance in favor of the musical score. Notation, of course, is seldom even employed in popular music texts, which are instead made manifest as recordings and live performances. Scholars therefore saw that popular music analysis had to engage with, first and foremost, the aural experience of music.[49] This move aligned itself with a more comprehensive turn within the discipline of musicology, which successfully engendered a paradigmatic shift toward studying the music performance, or music as audible event, as well.[50]

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[46] See Kerman, 1980 and 1985.

[47] In addition to individual scholars, significant contributions to the transformation of popular music studies into an academic discipline came with the academic journals *Popular Music and Society*, published by Routledge and founded in 1971, and *Popular Music*, published by Cambridge and founded in 1981. The International Association for the Study of Popular Music (IASPM), established in 1981, has also played a significant role. Regarding publishers, Wesleyan's Music/Culture series, which started publishing books in 1993 under an editorial board consisting of George Lipsitz, Susan McClary, and Robert Walser, and Ashgate's Popular and Folk Music series, initiated by Derek B. Scott (as general editor) in 2000, have been important.

[48] Examples of articles addressing this problem include McClary and Walser, 1990, and Middleton, 1990. For discussions concerning how popular music entered into the discipline of musicology, see, among others, Hawkins, 2002 and 2012, and Moore, 2003 and 2007.

[49] For instance, Anne Danielsen (2006 and 2010) compellingly demonstrates the fact that the score does not capture what happens on a microrhythmic level and therefore typically misses what makes popular music groove. Tellef Kvifte (2004 and 2007a) likewise observes that the score does not capture the elastic or irregular meter that we find in some folk songs. Nevertheless, both scholars endorse Robert Walser's pithy conclusion: "Yet if notation conceals, it also reveals" (Walser, 1995: 199).

[50] For examples of how this change was addressed in the discipline of musicology, see Cook, 1999; Goehr, 1998; Kivy, 1995; Small, 1998; and Taruskin, 1995. This "performative turn" also took place within other disciplines, as Erling E. Guldbrandsen points out: "Some call this

However, even these noble new popular music analyses of *what is heard* suffered the hangover of a long tradition of score analysis in their tendency to favor those musical features best represented by the score—that is, melody, harmony, and rhythm, as well as (where applicable) the lyrics, neglecting features such as timbre and sound. This trend is starting to change, but huge gaps remain, including that which is addressed by the present study: the impact of mediating technology upon this sonic result and upon the aesthetic experience and meaning of popular music. As will be outlined below, the study of popular music's "technological musical parameters," to use Serge Lacasse's term,[51] has finally started to take root, but the full complexity of technological interventions and technology's ability to generate new kinds of musical expressions and experiences are yet to be studied in depth.

Over the last twenty years, several scholars have contributed significantly to the conversation regarding how technological mediation has shaped popular music practices. However, this domain has usually been approached from a sociological or historical orientation with a focus on extramusical features rather than the music itself. For instance, a central issue in the scholarly discussion has been how changes in recording technologies have had industrial and political consequences that have led in turn to changes in the industry's organization and, consequently, its power structures.[52] Such studies have concerned themselves with the ways in which digital technologies have impacted how music is marketed, promoted, distributed, and acquired, and how technology has affected the economic structure of the music industry in terms of skirting the traditional path that leads to copyright royalties.[53] Technological innovation, in terms of recording technologies and musical instruments, has also interested many scholars, especially with regard to the ways in which sound technologies are socially and economically embedded.[54] Following upon

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a veritable shift of paradigm in the history of humanities—from semiotics to linguistic performance (Austin, Searle), from structuralist to performative poetics (Derrida, Felman, Hillis Miller), from textual theory to performative aesthetics (Fischer-Lichte, Schechner), and from biological to performative theories of gender identity (Butler)" (Guldbrandsen, 2006: 140–41).

[51] Lacasse, 2000: 11.

[52] For a discussion of the relationship between popular music institutions and politics, see Bennett et al., 1993. For an overview of the international music industry and the changes that it faces in the digital age, see Wikström, 2009.

[53] For discussions concerning music and copyright, see, for instance, Frith and Marshall, 2004; Graber and Nenova, 2008; McLeod, 2005a, 2005b, and 2007; and Vaidhyanathan, 2003.

[54] See Sterne, 2003, and Théberge, 1997, for exemplary studies of these issues.

this is an interest in the relationship between innovation and consumption, in terms of how users respond to new technologies, utilize and give meaning to them, and ultimately influence them in turn.[55] Another central question involving the consumption practices of music has been how new technologies have altered listening habits and the listener's approach to music as reified, and consequently how the boundary between production and consumption has started to blur.[56] Others have examined the ways in which the nature, conception, manifestations, and value of the live performance of music have altered, and therefore how the relationship between live performances and music recordings has altered as well.[57]

In the context of the present thesis, I have benefited significantly from these sociological or historical perspectives on how music practices have been transformed by recording technologies but have lamented the neglect of the music itself, and the impact of technological mediation upon its aesthetics, in these approaches. That is, while several scholars, particularly those with a background in music criticism, ethnomusicology, history, or cultural studies, have given impressive accounts of music's cultural contexts and social, economical, emotional, and corporeal effects, they have been hard pressed to relate such extramusical features to intramusical features. The dominant sociological and historical perspectives on music technologies reflect a general tendency in popular music studies to focus on music's social meaning at the expense of the musical text, which is a consequence of a confrontation, in the spirit of poststructuralism, with the positivistic approach of conventional musicology (that is, the search for meaning as something inherent in the musical structure, thereby neglecting the music's broader context).[58] Two decades ago, Richard Middleton addressed this problem, suggesting, "Rather than pulling to one side, with the traditional musicologists, or the other, with the 'total critics' of musicology, it will be better to *look both ways*, *living out the tension*"[59]—a plea that was later answered by popular music scholars such as Anne Danielsen, Peter Doyle,

[55] For discussions concerning the aesthetic and ideological conflicts between new music instruments and technological music equipment, see Frith, 1986; Goodwin, 1990; and Toynbee, 2000.
[56] For a discussion of changing listening practices, see Bergh and DeNora, 2009; Bull, 2000 and 2007; Ebare, 2004; Krims, 2010; and Skånland, 2011.
[57] See, for example, Auslander, 2008; Elsdon, 2010; Gracyk, 1996; Johnson, 2010; Porcello, 2005; Wurtzler, 1992; and Zak, 2001 and 2012.
[58] The key reference addressing this critique is Kerman's 1980 article "How We Got Into Analysis, and How to Get Out."
[59] Middleton, 1990: 123. Emphasis in the original.

Stan Hawkins, Adam Krims, Serge Lacasse, Allan F. Moore, and Robert Walser. If the "pop text is more than just the song," as Hawkins suggests,[60] the music itself should nevertheless remain part of this text, and of course part of the technological narrative that is being constructed about it. In retrospect, it is truly remarkable how little consideration has been given to technological parameters in the field of music *analysis* (or within what Allan F. Moore would define as popular *musicology*).[61] Since music analysis is the focal point of the present thesis, I will in what follows survey some of the serious attempts to analyze technological mediation in popular music, beginning with academic books and concluding with a couple of particularly relevant articles.

Albin J. Zak III's *The Poetics of Rock: Cutting Tracks, Making Records* (2001) was one of the first books to pay significant attention to the fact that the process of editing and mixing music in the studio is an *art*, not simply a *craft*. Zak examines in detail how technological mediation is applied creatively, and how it thereby contributes significantly to the musical end result. Virgil Moorefield takes a similar approach in *The Producer as Composer: Shaping the Sounds of Popular Music* (2005), in which he examines the convergence of these two roles. Specifically, he traces the responsibilities of the producer from the phonograph era to the present day (that is, 2005) and notes the cultivation of a more artistic and creative producer presence as music technologies have developed. Both Zak and Moorefield's approaches to these musical roles informed my own take upon the impact of mediating technologies in music today. William Moylan's *Understanding and Crafting the Mix: The Art of Recording* (1992, revised 2002), Allan F. Moore's *Rock: The Primary Text—Developing a Musicology of Rock* (1992, revised 2001), and Serge Lacasse's *"Listen to My Voice": The Evocative Power of Vocal Staging in Recorded Rock Music and Other Forms of Vocal Expression* (2000) were also among the first lengthy studies to take technological parameters into account in their popular music analyses. I have, in particular, benefited from these scholars' thorough treatments of musical spatiality (together with the works of Peter Doyle, whom I will discuss shortly). While Moylan, like Zak and Moorefield, analyzes the music and its

[60] Hawkins, 2002: 7.
[61] According to Moore, "Popular musicologists [as opposed to scholars of popular music studies] in one level or another concern themselves with the musical text, how it operates and how it is (or has been, or could be) constructed and interpreted" (Moore, 2007: x).

technological mediation from the perspective of the producer, Moore and Lacasse are more interested in how the listener perceives the various technological parameters of the mix. These different approaches to musical spatiality informed my own narrative in chapter 3, and the music-analytical tools these scholars introduce have likewise accommodated my own musicological procedure for analyzing sound.

Unlike the present study, however, none of the aforementioned works is concerned with how *digital* technology in particular has affected music production, nor do their analyses delve deeply into the fact that the experience of various forms of technological mediation might differ from listener to listener. Timothy Warner's *Pop Music: Technology and Creativity—Trevor Horn and the Digital Revolution* (2003), Stan Hawkins's *Settling the Pop Score: Pop Texts and Identity Politics* (2002), and Timothy Taylor's *Strange Sounds: Music Technology and Culture* (2001), on the other hand, do address the technological mediation of the digital era. Though Warner is not especially concerned with how technological parameters are experienced, his account is informed by a subtle insider sensibility regarding the utilization of digital technologies as well as particular aspects of their relationship to analog recording technologies. Hawkins discusses several processes of technological mediation that are significant within the music, but since his main focus is on the construction of the pop artist's identity, which he considers to be a hybrid construct of technology and performer, Hawkins necessarily stops short of much analytical detail concerning those technological parameters. His book is significant, however, for the way in which it addresses the fact that technological mediation affects both the music *and* the listener, and it exemplifies how these parameters might be incorporated into music analysis. Like Hawkins, Taylor is interested in how the listener gives meaning to music, and the technologies involved in music production, and his book engages with the impact of digital technology, and technology in general, upon music production, distribution, and consumption.

While these scholarly works are either used explicitly in my thesis or serve as a backdrop for the development of my arguments, the works of Mark Katz's *Capturing Sound: How Technology Has Changed Music* (2004) and Peter Doyle's *Echo and Reverb: Fabricating Space in Popular Music Recording, 1900–1960* (2005) perhaps come closest to this study itself, in terms of both topics and methodology. As mentioned above, Katz gives an account of both how recording technology impacts music and how the listener responds to that technology, so his aim is thus similar to

mine here. (Among his seven analytical case studies, which range from the early twentieth to the early twenty-first centuries, his chapters 6 and 7 are the most relevant, because they concern *digital* technology's impact on the music and the listener.) Doyle looks closely at two specific audio-processing effects—echo and reverb—and their role in signifying space. His dual interest in how particular forms of technological mediation inform analytical details and how the sonic outcome of these mediating tools informs the listener echo my own, although his music case studies are, as the title suggests, from an earlier era.

In addition to these books mentioned that are concerned with music analysis, there are several articles that have inspired me and provided me with valuable insights. Among the now quite large range of articles written on technological mediation in music (partly thanks to the initiatives of ARP and CHARM),[62] there are two in particular that I wish to introduce here: "Making Old Machines Speak: Images of Technology in Recent Music" (2000), by Joseph Auner, and "Mediating Music: Materiality and Silence in Madonna's 'Don't Tell Me'" (2009) by Anne Danielsen and Arnt Maasø. Both articles are devoted to the analytical details surrounding how mediating technologies might be used as compositional tools and how technological mediation might contribute to the aesthetics of music. The articles are both rare and exemplary in their attempts to highlight the fact that the perception of music is in constant flux and, as a consequence, so are the conceived meanings of mediating technologies.[63]

My thesis aims to establish a useful vocabulary and theoretical framework that can accommodate musicological procedures for analyzing popular music and particularly music-technological parameters, including how we perceive technological

[62] The focus on popular music and technology has been propelled forward by the establishment in 2005 of the annual *Art of Record Production* (ARP) conferences and the international online peer-reviewed journal titled *Journal on the Art of Record Production*, launched in 2006 (and relaunched in 2011), both initiatives that were founded by Simon Zagorski-Thomas and Katia Isakoff. The AHRC Research Centre for the History and Analysis of Recorded Music (CHARM), which lasted from 2004 to 2009 and was directed by Nicholas Cook at Royal Holloway, University of London, resulted in the influential anthology *The Cambridge Companion to Recorded Music* (2009) by Nicholas Cook, Eric Clarke, Daniel Leech-Wilkinson, and John Rink (eds.).

[63] Both these articles are particularly concerned with sonic imprints of the medium in terms of analog noise and/or digital silence, and their insights have enlightened my discussions in chapter 4 of the present thesis, where I deal with similar case studies. Moreover, these articles are each concerned with how technological parameters are perceived by the listener and further stress that new and old technologies are always heard in light of one another.

mediation in music. Hopefully, it will contribute to, on the one hand, filling in the larger picture of music analysis by focusing on technological parameters, and, on the other hand, emphasizing the importance of analysis as a methodology for studies of music technology.

Outline of the Thesis

This thesis has seven chapters, including this introduction. Chapter 2 situates digital music technologies in a historical perspective, discussing how their characteristic functions relate to earlier recording media. In particular, I focus on how various recording technologies have acted to part the music more and more from its spatiotemporally coherent origin. I also discuss how the new capacities inherent in each new recording medium have been realized in different ways, identifying three alternative recording paradigms. Serving as a backdrop to my later analyses, this chapter suggests that although the conception of music has been dramatically altered, the roots of our conception of it as spatiotemporally coherent often cause us to associate, consciously or unconsciously, what we hear with some traditional musical form (regardless of any notion of authenticity or liveness).

Chapters 3, 4, 5, and 6 delve into the musical material, using close analyses to discuss the novelty of the selected digital signatures, their use in the music production process, and their contribution to the music's meaning. Chapter 3 examines the signature of digital reverb and delay in terms of how these processing effects have increased the possibilities for experimenting with spatiality in music productions. My point of departure is Kate Bush's "Get Out of My House" from 1982, with which I explore how delay and reverb effects have been exploited in ways that can be experienced as opaque and surreal, because they so evidently diverge from the sounds' natural acoustic behavior. I am also interested in the ways in which these signal processing effects might function metaphorically, in terms of either emphasizing the musical meaning or creating new meaning.

Chapter 4 is primarily concerned with the characteristic *silence* of digital mediation, and how this silence inspired music makers to revisit older technologies *because of* the unavoidable noises that accompany them (tape hiss or vinyl crackle, for example). These old noises enjoyed a rebirth of sorts, as artists and listeners revitalized and revalued what had formerly been regarded as simply the limitations or byproducts of the equipment. In this chapter, I focus on Portishead's "Strangers" from

1994, which bears traces of pre-digital medium signatures even as it specifically highlights its digital medium as well. I will discuss how this juxtaposition of old and new represents a ("retro") trend in which each is understood and enjoyed in light of the other.

In chapter 5, I seek to illustrate how the virtual cut-and-paste tool of the DAW offered a similar yet decidedly alternative approach to music manipulation from the older practice of cutting and pasting using physical tools. I discuss this digital signature via an analysis of DJ Food's "Break" from 2000, which bears clear traces of cut-ups in its incomplete sounds, abrupt transitions between sound sequences, signal dropouts, stuttering rhythms, and other percussive effects. I also discuss how the sonic result of the cut-and paste tool might be associated with malfunctioning digital technology, and how these cut-up sounds might perceptually balance on the border between the music's interior and exterior.

In chapter 6, I examine the ways in which the digitalization of technology has facilitated the practice of music recycling. In particular, I discuss how the combination of treating samples digitally in computer-based sequencer programs and using the Internet as both musical archive and arena for distribution has encouraged a new twist on the old practice of recycling music—namely, the musical mash-up. The chapter features an analysis of the mash-up "Psychosocial Baby" by Isosine (aka Steven Nguyen), which was released as a bootleg on the Internet in June 2011, and which juxtaposes full-length samples of the vocal lines from Slipknot's "Psychosocial" with the instrumental of Justin Bieber's "Baby." I am particularly interested in the ways in which the mash-up's meaning for the listener relies heavily on his or her specific recognition both of the technological processes involved *and* the intertextual play that is inscribed there.

Chapter 7 engages with the very fundamental questions that are raised and explored elsewhere in the thesis. Pulling together my main arguments, I address the ways in which the production and experience of popular music have been affected by the digitalization of technology. I also suggest that opaquely mediated music, such as the examples analyzed in this thesis, often challenges the traditional notion of music as a spatiotemporally coherent performance even when it is premised on that very notion. This discussion leads into a consideration of how the two competing forces of historical listening constraints and the tuning of the ear might in fact combine to culminate in a unique musical meaning.

Summing up, the aim of my thesis is to use musical analyses, aesthetic interpretations, and theoretical discussions to produce insights into the ways in which digital mediation has affected the production processes of music, while also exploring how the mediation in digitally produced popular music is perceived, and how it affords a wide range of meanings. In this way, this thesis hopefully represents a contribution to the ongoing scholarly discussion of how mediation contributes to the aesthetics of popular music.

Chapter 2

The Spatiotemporal Disjuncture of Music

For centuries, all forms of music had particular features in common: the music was always performed by musicians at one specific place and organically unfolded over time.[64] Moreover, the music was only accessible to those who were present at the time it was performed. Accordingly, music was, without exception, spatiotemporally coherent and could *only* be heard in accordance with the acoustic laws that applied to its "live" performance. These specific and defining qualities of music did not change until the invention of the phonograph in 1877 introduced people to an era of what Canadian composer and writer R. Murray Schafer has labeled *schizophonia*, to emphasize the distinction between original and reproduced sounds (*schizo* is "split" and *phonia* is "sound" in Greek).[65] Schafer characterized schizophonia as a permanent and uniform condition, but I find it fruitful to distinguish among three rather different phases within it: the mechanical, the magnetic, and the digital eras of schizophonia.[66] While the invention of the phonograph occasioned the cultural shift to schizophonia (in its mechanical era), the invention of the magnetic tape recorder brought about a new schizophonic era, given its dramatic new possibilities for spatial and temporal disjuncture between sound and its source(s): fundamentally, it allowed for several takes that could be treated separately, which in effect enabled the editing of individual aspects of a given performance. Consequently, recorded music came to encompass (and, in turn, imply) a patchwork of sounds recorded at different times and in different spaces. Digital technology did not split these sounds any *further* from their sources than the magnetic tape recorder did, but it heralded a new schizophonic era

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[64] Parts of the discussions of this chapter appear in, or are revised from, Ragnhild Brøvig-Hanssen (2013): "The Magnetic Tape Recorder: Recording Aesthetics in the New Era of Shizophonia," in *Material Culture and Electronic Sound*, eds. Frode Weium and Tim Boon, pp. 131–57 (Washington, D.C.: Smithsonian Institution Scholarly Press/Rowman and Littlefield Publishers).

[65] Schafer introduced the term in *The New Soundscape: A Handbook for the Modern Music Teacher* (1969).

[66] I do not mean these terms to imply that these eras were exclusively based on these respective technologies; for instance, digitally converted sounds could be stored magnetically. The terms rather point to the technological recording techniques that were new to the era and that had a tremendous impact on the means of recording and composing music.

regardless, in the sense that the digital conversion of sounds into binary numbers facilitated the practice of splitting them from their sources, so this split has consequently become even more frequent and profound. As Nick Prior puts it: "Digital mediation intensifies the elasticity of the musical text, as digital code lends itself to repeated creation, formation and iteration."[67]

The different eras of schizophonia have variously affected how we compose music, how we listen to it, and, not least, how we conceptualize it. In order to frame digital mediation in its historical context, then, I will devote the first half of this chapter to describing each of these eras, in chronological order, following Aram Sinnreich's prescient observation: "In order to discuss how things are changing, we must first establish what they are changing from."[68] In particular, I will focus on how the respective recording technologies either enabled or constrained manipulations of music's spatiotemporal features.

In the second half of this chapter, I will discuss how music makers have approached the schizophonic abilities offered by each recording/production medium in very different ways; some have sought to conceal the music's fragmented construction, while others have sought to expose it. I will begin by describing the ways in which the magnetic tape recorder's improved capacity for sound manipulation profoundly enriched both musical styles and paradigms, in effect bringing about a new understanding of the recording/production medium and a changing conception of music. I will then trace the persistence of the different magnetic-era approaches in the digital era, and examine the new forms some have taken. My goal is to demonstrate that although music that exposes its spatiotemporally fragmented form has a long history, digital mediation represents a fresh take on the whole art and craft of popular music production, also in these terms.

Regarding Schafer's work on "schizophonia," Steven Feld rightly observes that the elder scholar had a "suspiciously anxious view of the impact of technology on musical practices and sound environments."[69] Schafer admitted to exploiting his new linguistic construction's associations and "intending it to be a nervous word. Related to schizophrenia, I wanted it to convey the same sense of aberration and drama."[70] As

[67] Prior, 2009: 82.
[68] Sinnreich, 2010: 43.
[69] Feld, 1994: 258.
[70] Schafer, 1977: 91.

I will demonstrate in this chapter, the spatiotemporal disjuncture of music enabled by new technologies has always disturbed people,[71] but it has inspired them as well. In my use of the term here, I do not mean to endorse Schafer's misgivings but instead hope to evoke its most literal meaning alone—that is, the split ("schizo-") of sounds ("-phonia") caused by the recording medium.

The Mechanical Era of Schizophonia

Schafer points to the invention of the phonograph in 1877 as the dawning of the general era of schizophonia. He then describes this new technological ability to detach sounds from their live sources:

> Originally all sounds were originals. They occurred at one time in one place only. Sounds were then indissolubly tied to the mechanisms that produced them . . . Since the invention of electroacoustical equipment for the transmission and storage of sound . . . we have split the sound from the maker of the sound. Sounds have been torn from their natural sockets and given an amplified and independent existence. Vocal sound, for instance, is no longer tied to a hole in the head but is free to issue from anywhere in the landscape.[72]

The phonograph challenged our traditional understanding of sounds as emerging directly from a live source. In his important essay "A Voice without a Face" (1991), Dave Laing informs us that members of the audience fainted when Edison demonstrated his speaking phonograph in 1888 and observes that this disembodied sound "must have been a vital shift in the experience of listening to music."[73] Early print advertisements from the recording industry play upon this point: the iconic RCA Victor dog Nipper sits alertly in front of a recording horn, curiously listening to "His Master's Voice," while an Edison Company advertisement depicts a child destroying a phonograph while "Looking for the Band."[74] While the already familiar telephone also mediated a voice without a face, those sounds remained "live" in the sense that they were produced at the same time that they were being heard. This incidence of *spatial* detachment, then, paled in comparison to the phonograph's *temporal* detachment, whereby the reproduction of sounds definitely did not enjoy a necessary relation to a simultaneous, if distant, source.

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[71] For a related discussion, see, for example, Frith, 1986, and Toynbee, 2000.
[72] Schafer, 1977: 90.
[73] Laing, 1991: 7.
[74] Sterne, 2003: 264.

However, although the sounds of a musical performance were cut loose from their origins in time and space, they nevertheless remained a unit; what you heard from the recording was the sound of a preexisting coherent event that had been recorded in one take. The rare exceptions to this were recordings that resulted from very early applications of the technique of overdubbing. With two separate recording machines, one could record a machine playing already recorded material while recording new sounds atop it. Thus, the final product would reproduce the sounds of a combination of two or more different events, rather than a single, coherent event.[75] While Simon Frith observes, "[Magnetic] tape broke the previously necessary relationship between a musical object in space and a musical object in time,"[76] it was in fact already breaking, even in the era of mechanical recording, through the earliest applications of overdubbing. Still, the socially ascribed meaning and function of the phonograph was generally to serve as an archival medium rather than a creative tool; Edison himself celebrated its ability to "preserve and hear again . . . a memorable speech, a worthy singer . . . the last words of a dying man . . . of a distant parent, a lover, a mistress."[77] Early music recordings were therefore specifically promoted as archived events, or copies of original performances. Between 1915 and 1925, the Edison Company demonstrated their "Tone-Test Recitals," which required audiences first to listen to a woman singing a song, and afterward to listen to the recording of the same event, the purpose of which was to convince listeners that there was no difference between the original and its reproduction.[78] Recording sleeves likewise often confirmed that "comparison with the living artist reveals no difference,"[79] and

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[75] The American guitarist and inventor Les Paul is famous for having started to experiment with overdubbing in the 1930s (Cunningham, 1998: 25), but, in fact, Igor Stravinsky made use of the technique already in the years between 1917 and 1927, when he performed his four-hand piano scores by overdubbing himself using a combination of two existing recordings (Théberge, 1997: 217). Overdubbing was also used to provide orchestral accompaniment for the Italian opera singer Enrico Caruso, whose career spanned from 1895 to 1920. Other artists who explored pre-magnetic overdubs include the German soprano Elisabeth Schumann, who in 1935 sang both parts of the "Evening Prayer" from Humperdinck's *Hänsel und Gretel*; Sidney Bechet, who overdubbed all of the instruments (saxophones, clarinet, string bass, drums, and piano) on his "Sheik of Araby," released by RCA Victor in 1941; and the violin virtuoso Jascha Heifetz, who in 1946 played both parts of Bach's concerto for two violins (see Day, 2000: 29, and Chilton, 1987: 141).

[76] Frith, 1996: 234.

[77] Quoted in Chanan, 2000: 24–25.

[78] Eisenberg, 2005: 90–91. For a comprehensive discussion of the Edison tone tests, see Thompson, 1995.

[79] Eisenberg, 2005: 90–91.

advertisements described recordings as "lifelike," a "true mirror of sound," "natural," or "the real thing."[80]

Given this context, Toynbee reads the slow adoption of sound-manipulation techniques less as a result of their perceived lack of promise than as a byproduct of the conservative approach to new possibilities around framing performances, which he sees as characteristic of the history of music and technology in general.[81] Whatever the larger cultural bias, experiments were undertaken and significant technical difficulties were promptly encountered. Foremost among these was the fact that when one overdubbed from disc to disc via mechanical or electromechanical recording, the sound deteriorated significantly from one copy to the next. And mistakes could be disastrous as well: John Chilton remarked, regarding Sidney Bechet's "nerve-wracking experience" of overdubbing the "Sheik of Araby," that "if a mistake occurred it meant a fresh start" (he further recalled that even thinking about the session gave Bechet nightmares, and he never tried it again).[82] Thus, although the possibility of manipulating time and space in the reproduction of music had existed since the birth of the recording medium, it was only through the magnetic tape recorder and the invention of multitracking that it became truly viable as such.

Although the performances being recorded had to be customized to accommodate the limitations of the phonograph, the event represented by the mechanical recording medium remained "trustworthy," in that the sounds were legitimate signs with an actual and causal connection to what they represented. Using Charles S. Peirce's vocabulary, in the early era of schizophonia, recorded sounds were *indexical* signs of the preexisting event, which means that the sounds and the event were not *only* connected by similarity and affinity.[83] The connection was actual and causal as well, and the recorded sounds were true signs of what they represented (in contrast to the recordings of the magnetic and digital eras). John Philip Sousa's slur on phonograph music as "canned music" is, in fact, an accurate description of how the recording medium was used in its early days.[84] In his description of the early use of the electric condenser microphone, Toynbee echoes Sousa's imagery: "The

[80] Katz, 2004: 2.
[81] Toynbee, 2000: 70–73.
[82] Chilton, 1987: 141–42.
[83] An index is, according to Peirce, "a sign which refers to the Object that it denotes by virtue of being really affected by that Object" (Peirce, 1960: 143).
[84] Quoted in Sterne, 2003: 292.

microphone stayed resolutely outside the ensemble, and the performing system—small group, orchestra, solo performer—was consolidated as a *hermetic unit*."[85] After the invention of the phonograph, then, music was still heard as a spatiotemporally coherent event. It was the invention of magnetic tape that would ultimately revolutionize our conception of music, and of musical recordings.

The Magnetic Era of Schizophonia

The magnetic era of schizophonia did not commence upon the sudden arrival of a particular machine; the technology (and impact) of the magnetic tape recorder has a history that spans a half-century. American engineer Oberlin Smith identified the basic principle behind magnetic recording as early as 1878, the year after Edison patented the phonograph, as Smith tried to minimize the latter object's background noise. In the interests of improving the sound quality of recorded material, Smith turned to the technology of telephony, in which sounds were transformed into electric currents.[86] Smith rightly predicted that when electric currents converted from sounds are placed near a magnetizable material such as a wire, a magnetic field on the wire would emerge, and the patterns of the currents would produce a similar magnetic pattern on the wire. In this way, sounds could be stored on a medium without physical contact. A realization of Smith's idea, combined with improvements in electronic amplification, eventually led to the commercial establishment of steel tape and wire recorders during the 1930s.[87] The solid-steel recorder had significantly longer recording time than the three minutes permitted by the phonograph, and its robust design was more fit for traveling as well (these advantages made it particularly popular as a medium for dictation, and during the war it was used for military operations, such as secret audio surveillance). Despite the improvements in electronic

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[85] Toynbee, 2000: 71. My emphasis. I have deliberately not distinguished between mechanical and electromechanical recording in this context. Although electromechanical recording impacted the early era of schizophonia in live settings—the amplified sounds of the microphone challenged the human ability to locate "live" sounds spatially—it did not usher in a completely new era of schizophonia in terms of musical recordings, because it only allowed for one-track recording and suffered its predecessor's severe limitations upon overdubbing.

[86] Clark, 1999b: 7.

[87] The first-known realization of this idea arrived twenty years later, when the Danish engineer Valdemar Poulsen demonstrated and patented his Telegraphone—an electromechanical recording medium, initially invented for office dictation and recording telephone conversations. Although the Telegraphone showed great promise and was by some regarded "the next phonograph," the volume of the recorded sounds of the Telegraphone was very low, and the medium itself had to await the development of adequate amplifiers in order to become commercially successful (Morton, 1999: 15–29).

amplification, the volume of the sound signal of early steel-wire magnetic recorders remained significantly lower than that of the phonograph,[88] which remained the standard medium in recording studios until the magnetic tape recorder finally overtook it in the 1950s.[89]

There were several advantages to switching from standard solid-steel material to a softer, non-magnetic coated material with iron particles. Tape was easier to handle than wire; it did not tangle while rolling; and it provided better sound quality. It was also less expensive to produce than either the contemporary phonographic disc player or the steel wire recorder. By the mid-1950s, the magnetic tape recorder was in general use throughout the sound-reproduction industry, and over the next thirty years, manufacturers worldwide would continue to improve the technology, focusing on ever cheaper and smaller machines that would produce less noise and be easier to operate.[90]

The tape recorder also offered sound engineers the ability to manipulate the space and time components of their recorded material; sounds could be thoroughly detached from their spatiotemporal origins *and* juxtaposed with other sounds with other origins. For instance, tape made it possible to literally cut tracks apart and paste them together again through the process of splicing: after placing the sound sequence that needed to be split between the two open reels of the tape recorder, the engineer used a ruler to locate the exact spot and then cut the tape with a razor blade, guided by the channel of a metal splicing block. Using a piece of editing tape, he or she could then recombine the two loose ends into a continuous sound section.[91] Through

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[88] "Phonograph" here refers to the technology of the acoustic recording medium, not to the particular invention of Edison.

[89] In 1928, Australian inventor Fritz Pfleumer glued pulverized iron particles onto coated cigarette paper and installed the paper on a self-made reel-to-reel machine, which was in fact the first magnetic tape recorder. In 1932, Pfleumer signed a contract with the German electronics group AEG (Allgemeine Elektricitäts-Gesellschaft), and in 1938, AEG succeeded in introducing the first commercially viable tape recorder: the Magnetophon K4. During the war, at least, Magnetophons were produced only for military needs (Engel, 1999: 47–67). The American electronics company Ampex decided to develop its own tape recorder based on the technology of the Magnetophon K4 and secured financing from American singer Bing Crosby, who was eager to find a method to prerecord his radio shows with better sound quality than phonographic discs could offer. In 1948, the company introduced the Ampex Model 200, the first successful American tape recorder, and it proved to be crucial to the eventual establishment of magnetic tape as the standard recording medium in broadcasting and recording studios of the era (Clark, 1999a: 92–93).

[90] Clark, 1999a: 92–93. For a comprehensive discussion of the development of the magnetic tape recorder, see Brøvig-Hanssen, 2012.

[91] Holmes, 2002: 79.

splicing, engineers were able to freely juxtapose musical tracks from different times and places.

The spatiotemporal disjuncture of sound was further ushered along by the multitrack recorder. Les Paul developed an overdub (or sound-on-sound) technique by modifying his Ampex Model 300 with an extra playback head and altered tape path, but the manager of Ampex's Special Product Section, Ross H. Snyder, saw the need for a technology that would improve this process of overdubbing even more. Though multichannel recorders had existed for some time, their channels could only record simultaneously, in real time, and stored sound on one track only. Snyder therefore invented a technology called Sel-Sync (a shortening of "selective, successive, synchronous") that made it possible to record individual tracks separately and in complete isolation from one other.[92] Ampex built its first eight-track Sel-Sync recorder in 1956, and by the late 1960s the multitrack recorder had become standard equipment in studios, with sixteen- and twenty-four-track machines soon to follow. While Snyder in an interview described only modest initial hopes for the invention and mistaken assumptions about its limited application,[93] fate would prove otherwise for this new technology.

Compared to one-track recording machines, the multitrack recorder was a huge step forward in the overdub technique. It made mistakes less devastating, because the individual parts were stored on separate tracks. Parts could now be recorded separately at different times, and, if desired, in different locations, and the multitrack recorder solved the problem of degradation in sound quality that took place after each new overdub. Also, because sounds could be recorded through several channels without being automatically bounced onto a single track afterward, the tracks could be treated separately even *after* they had been recorded. Thus delay or reverb could be applied to individual sounds, for example, instead of only the overall mix. By deliberately placing individual sounds within the stereo field and/or adding processing effects such as reverb and delay to them,[94] the engineer could mold whole "virtual

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[92] Snyder, 2003: 209–13.

[93] Snyder recalled: "[I wanted it] to improve the recording process for those doing overdubs for any reason . . . I mistakenly thought its usefulness somewhat narrow, and did not dispute Ampex's patent attorneys's advice that it might be taken as obvious art, thus probably not patentable" (Snyder, 2003: 210).

[94] Stereophonic sound was introduced at almost the same time as multitrack recorders. The first commercial stereo recording was produced by RCA in 1954, but the technique was not publicly available until the end of the 1950s (Day, 2000: 20). (Stereophonic sound must not

spaces,"[95] even those that appeared contrary to natural acoustic laws. The musical performances represented by the recordings that used the new technology of multitrack recording had not necessarily existed as such, then, but they *sounded* real. Alternatively, performances that did not sound real at all, in that they purposely exposed their fragmented construction, also started to emerge, thanks to the recorded sounds' transcendence of the spatiotemporal laws of acoustics. Thus, multitrack recording challenged even more strongly than previous recording technologies our aural sense of time and space. The praxis of constructing music out of several takes soon became the standard way of making recordings, whatever one's specific methods or ultimate musical goals.

This new capacity for manipulation altered the way musicians, producers, and sound engineers worked in the studio while recording and mixing sound. While some engineers simply applied the new medium as they had the phonograph, others saw new possibilities for "improving" upon reality. Still others experimented with the new recording and editing abilities in entirely unanticipated ways. Consequently, a profound enrichment in recorded musical expression resulted from the advent of the magnetic tape recorder (I will return to this discussion later in this chapter). The studio went from being an archiving center to becoming a laboratory for "sculpting" patchwork performances out of several takes. As a result, more and more people started (with good reason) to question the sounds' certainty as signs, because these signs were now merely of *plausible* rather than indexical character. The causal relationship was gone, and the referent of the sign had to be regarded instead as unspecific.[96] To confuse matters further, in the new era of schizophonia, fiction could easily be presented as truth. Thus, we might still perceive the recording as pointing back to a specific referent, but that referent can only be defined through individual interpretation. Because of its new recording and editing abilities, then, the recording device had transitioned from an archival medium to an artistic medium, one that represents musical performances with no claim to their preexistence.

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be confused with the two-channel recording system, often referred to as "stereo recording," that long anticipated it.)

[95] For a definition of "virtual space," see chapter 3.

[96] Recordings of the magnetic (as well as the digital) era thus comply with Michel Foucault's notion of the referent's uncertainty: the connection between the sign and the referent is not guaranteed by the order of things as such (Foucault, 2006: 100; the essay was first published in 1966).

The Digital Era of Schizophonia

If the phonograph split sound from its source and the magnetic tape recorder split the bundle of recorded sounds from their shared spatiotemporal frame, what was left to the latest era of schizophonia? An ever-expanding economy of scale: though digital technology did not split sound any further, it allowed the act of splitting to be both more profound and more frequent, in turn informing and even transforming the production of popular music yet again.

Digital technology found its way to music devices already in the 1960s, when American scientist Thomas Stockham began to experiment with digital audio recording systems. When talking about the "digital revolution" in the field of music, however, we refer not to this initial phase of digitalization but to the cultural turn that gradually arose in the 1980s and the 1990s and encompasses digital synthesizers, digital drum machines, digital sampler instruments, the MIDI system, Digital Signal Processing (DSP) effects, the CD and mp3 formats, the computer- and software-based recording platform often referred to as the Digital Audio Workstation (DAW), and the new musical arenas introduced by the Internet (YouTube, MySpace, P2P networks, and so on).

Digital recording is based on the pulse-code modulation (PCM) of a sound signal, which was devised by Alec Reeves in 1939.[97] Contrary to the recording medium of both the mechanical and magnetic eras, which stores continuous sound signals, the digital recording medium converts the sound signals into digital codes—that is, streams or combinations of binary numbers (0s and 1s). This process requires a circuit that converts the analog data into digital data: during digital recording, a continuous sound signal is sent through an analog-to-digital converter (ADC), where it is sampled and stored as digital information. This means that the voltage of the sound's waveform, which is basically a continuous raise and fall of amplitudes over time, is measured ("sampled") several times at exactly uniform time increments. The rate at which the waveform is sampled (the amount of samples per second) determines the sound quality of the recording, because it affects the frequency response. With modern digital recording technology, the sound signal is sampled 44,100 times a second (44.1 kHz), which results in a rather accurate reconstruction of the original

[97] Watkinson, 1999: 112.

sound signal.[98] In addition to the sampling rate, the amount of intervals to measure ("quantize") the dynamic range determines the accuracy of each sample as well. Each measurement is assigned a string of binary digits ("bits"), according to its amplitude. The higher the bit depth is, the more intervals there are, and the better the sound quality is. With the earliest samplers, producers could not sample with more than 8-bit accuracy, which represents 256 intervals (2^8) and a relatively low sound quality. The standard in the audio industry today is to sample with 24-bit accuracy, which represents 16,777,216 intervals (2^{24}), when recording sounds, and sample with 16-bit accuracy, which represents 65,536 intervals (2^{16}), when bouncing the sounds to the CD format.[99] When the recorded material is played back, a digital-to-analog converter (DAC) reconverts the digital information to continuous sound waves, recreating the exact voltage levels of the sound wave by calculating the sampled and quantized information. For an illustration of how sounds are sampled to the digital domain, see figure 1.

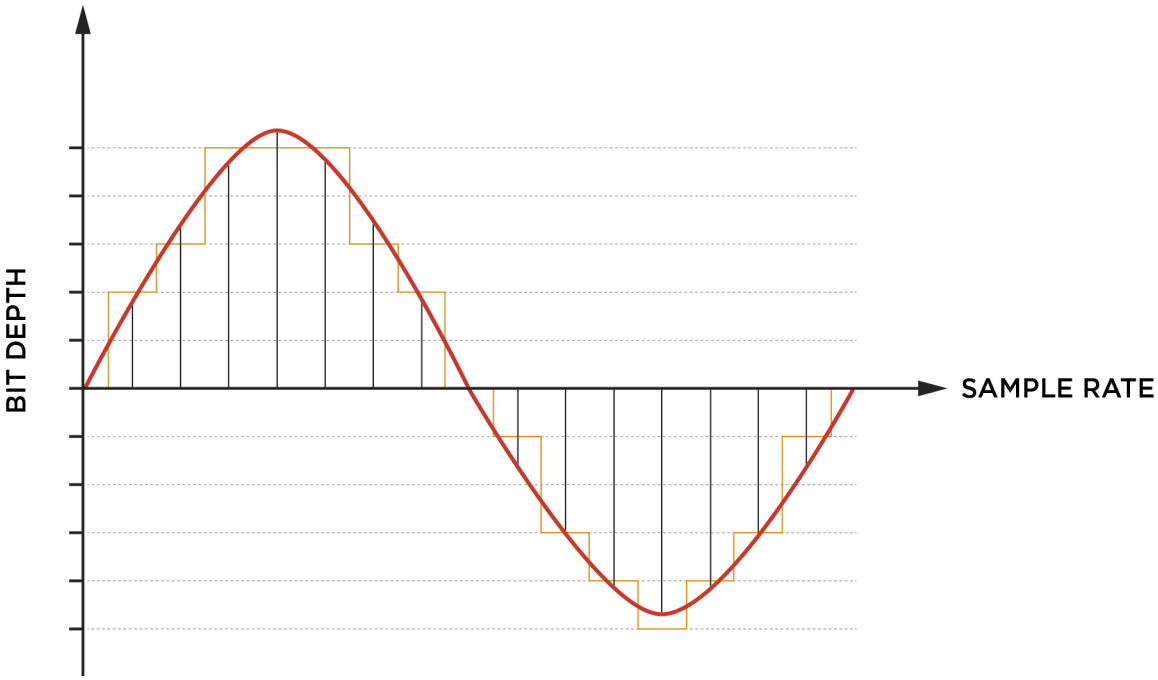

Figure 1: When a sound is converted from the analog to the digital domain, the amplitudes of the sound wave are sampled according to a given time per second (the sampling rate) and measured according to a given number of intervals of the dynamic range (the bit depth). The

[98] See, for example, Roads, 2000: 7–47, and Watkinson, 1999: 110–22.
[99] Pohlmann, 2000: 32–36.

vertical lines here represent the sampling rate, while the horizontal lines represent the bit depth.

In the beginning, the digitally converted sounds were stored on tape,[100] but it soon became possible to store the information on floppy discs and hard discs and in microprocessors as well.[101] The first practical digital recorder was demonstrated in 1967,[102] but, because of its great expense, it did not become standard technology in recording studios until the early 1990s.[103] However, the digital sampler instrument, digital synthesizers and drum machines, and digital signal processing (DSP) effects were embraced by the music industry already in the late 1970s and 1980s.

The sampler instrument, which is essentially a digital recording medium, was introduced at the end of the 1960s, but it could initially only sample very short sound sequences, due to its extremely limited random-access memory; the Fairlight Computer Musical Instrument (CMI), first available in 1979, only allowed for a second or two of sound, for example.[104] Early in the 1980s, then, music makers and manufacturers of musical instruments exploited the sampling technique mainly in terms of sampling short sounds from instruments in order to replace the existing synthetic sounds with more realistic ones.[105] Digital drum computers (such as the Linn LM-1 or Oberheim DMX, introduced in the early 1980s) and digital synthesizers (such as the Kurzweil or the Yamaha DX7, introduced in 1983) soon followed; these were based on samples (digitally recorded sounds) and frequency modulation (FM) synthesis. It was, in fact, not until the E-mu SP-12 became available in 1986 that one could sample even up to ten seconds of sound.[106] By the late 1980s, as the storage capacity of samplers had increased and the price had decreased, the sampler instrument had become a popular asset among musicians (in chapter 6, I will describe how this instrument was also often used as a means for recycling preexisting music). The sampler instrument introduced us to a new means of constructing music out of bits and pieces, a practice that was also encouraged by the Digital Audio Workstation

[100] Videotape, which could handle much more information than magnetic audiotape, was often preferred for the storing of digitally converted sounds (Millard, 2005: 349)
[101] See, for example, Millard, 2005: 348.
[102] Watkinson, 1999: 122.
[103] Millard, 2005: 356.
[104] Harkins, 2010: 181.
[105] Rose, 1994: 73.
[106] Harkins, 2010: 181.

(DAW)—that is, a software recording workstation running on computers with the possibility of audio and MIDI interface hardware. I will return to this technology shortly.

In 1981, the companies Sequential Circuits, Oberheim, and Roland agreed to standardize a digital interface that would enable their digital musical instruments to communicate with one another.[107] This protocol, labeled MIDI (Musical Instrument Digital Interface), was soon extended to several other digital instrument manufacturers as well. The computer was often used as a control center for managing these various digital instruments or MIDI processors.

The first computer-based software sequencer programs, which followed the introduction of home computers in the 1980s, could not operate audio sounds but only record and control MIDI information—that is, the parameters that *affect* the sounds, such as which sound to use, its onset, offset, and duration, its velocity, and any pitch-bend or filter changes. However, up to the late 1980s, these programs were expensive and difficult to use, and the Graphic User Interface (GUI) was poor, often displaying little more than numbers in different columns. By 1990, the sequencer programs had become more user friendly, and within a few years the GUI dramatically improved as well, switching from number representations to visually *remediated* tools and equipment found in analog studios,[108] such as a pair of scissors to represent the ability to cut a track, and a virtual mixing console that resembled an actual analog mixing console, complete with input channels, faders, and panning knobs.

Already in 1989, the American company Digidesign (now called Avid Audio) had launched the first computer-based sequencer program, Sound Tools (the ancestor to ProTools), to offer audio recording (on two channels), thanks to dedicated processing hardware. Still, the final insertion of audio files into sequencer programs had to await better computer-processor power and increased Read Access Memory (RAM) capacity. The 1990s witnessed dramatic developments in computer technology as well as fully functional MIDI/audio-integrated DAWs; by the late 1990s, virtual instruments had even been integrated into the DAWs, in tandem with a wide variety of integrated software signal-processing effects that could be used in real time and whose quality was comparable to hardware equipment. As the capacities for

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[107] Durant, 1990: 182.

[108] "Remediation," as Jay David Bolter and Richard Grusin define it, is "the representation of one medium in another" (Bolter and Grusin, 2000: 45).

computer storage, as well as processing and disk speeds, improved, the price of computers also dropped dramatically, as did the price of DAWs.

In fact, few of the components that make up the DAW are new. For example, the technology of digital recording can be traced back to the 1930s, when it was developed in the laboratories of telephone companies.[109] The virtual mixing console, as well as the virtual instruments and signal processing effects, are merely imitations or remediations of existing hardware equipment. The sequencer arrived already in the early 1970s with the EMS Synthi A, before the computer-based sequencer was introduced.[110] What *was* new about the DAW was that all of these technological inventions now existed in a single complete package that could be bought for a preposterously low price compared to its analog ancestors. During the 1990s, then, this fully functioning virtual studio made music production work a possibility for amateurs as well as professionals, thanks to its economic accessibility but also its user-friendly interfaces. Andre Millard points to a *Rolling Stone* article from April 2003 that referred to the "Pro Tools Nation,"[111] "an indication of the unprecedented success of this software and the influential role it played in recording music."[112] Most contemporary popular music is produced with the help of a DAW program, often in combination with digital and analog hardware equipment.

This shift from analog to digital technology significantly impacted how music was produced. First and foremost, the digitalization of sounds—that is, their conversion into numbers—enabled music makers to undo what was done. One could, in other words, twist and bend sounds toward something new without sacrificing the original version. This "undo" ability made mistakes considerably less momentous, stimulating the creative process and encouraging a generally more experimental mindset. In addition, digitally converted sounds could be manipulated simply by programming digital messages rather than using physical tools, easing the editing process significantly. For example, while editing once involved razor blades to

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[109] Fine, 2008: 1; Millard, 2005: 346.

[110] See Zeiner-Henriksen, 2010: 79. For a discussion of the development of MIDI and sequencers, see, for example, Manning, 2004: 181–400; Millard, 2005: 346–88; and Zeiner-Henriksen, 2010: 73–82.

[111] Among the leading DAW programs in the 1990s and 2000s were Digidesign's Pro Tools, Emagic's Logic Pro, and Steinberg's Cubase, and they remain viable today, though new challengers include Ableton Live, Sonar (formerly known as Cakewalk), Reaper, and PreSonus Studio One, as well as Fruity Loops and Reason (which have only recently started to offer audio recording).

[112] Millard, 2005: 386.

physically cut and splice audiotapes, it now involved the cursor and mouse-click of the computer-based sequencer program, which was obviously less time consuming. Because the manipulation of digitally converted sounds meant the reprogramming of binary information, editing operations could be done with millisecond precision. This microlevel access at once made it easier to conceal any traces of manipulations (such as merging tracks in silent spots) and introduced new possibilities for manipulating sounds in audible and experimental ways (I will return to this discussion in chapter 5).

Manipulating sounds by programming digital information also facilitated the use of audio signal processing. For instance, compared to the analog tape delay, which involved the process of manually delaying a physical duplication of the audiotape from the original audiotape, or plate reverb, created by a vibrating steel plate, the digital equivalents involve simply mathematical adjustments to the sound information (I will discuss these signal processing effects in more detail in the next chapter). By adding digital reverb to a sound, it could be sonically transferred from its original recording space to a completely different space. Digital reverb could create eerily realistic spatial simulations, but it could also add a presence to sounds that did *not* correspond to the spatiality of the exterior world.

Digital information could also be stored, which, among other things, made it possible to equip digital instruments, processing effects, and other digital equipment with presets—that is, already aligned settings of device parameters such as synthesizer patches, rhythm patterns on drum machines, and controller positions for various signal-processing devices. Producers could also store their various arrangements on their mixing consoles, which allowed for a trial-by-error approach and an accurate and instant re-creation of previously aligned settings. The latter ability also made it possible to execute abrupt transitions among several parameters of the mix simultaneously, in contrast to analog mixing, where changes had to be done manually, in real time.[113]

The fact that digital technology was able to produce perfect copies of sounds, without the slightest deterioration, also propelled the "loop aesthetic" forward, especially in the genres of hip-hop and electronic dance music, both of which were very important in the 1990s. While repetition had been a central structural feature of popular music for decades, it acquired new meaning in the digital age, when it came

[113] See Brøvig-Hanssen and Danielsen, forthcoming, where we discuss this specific aspect of digital technology in our analysis of Suede's "Filmstar" (*Coming Up*, Nude Records, 1996).

to encompass the repeated return of *exactly* the same chunk of music, over and over—in effect, musical clones. If the digital sampler of the 1980s pushed the "montage aesthetic" into the frame of digital schizophonia, the computer-based sequencer programs of the 1990s and onward pushed everything a little further still, in terms of freeing music from its spatiotemporal origins. One of the specific and enduring reasons for this is the visual environment that the sequencer programs present. The "editing board" interface or "arrange window" offered by the sequencer programs, in which editing operations—such as cutting, pasting, copying, merging, deleting, and moving sound sequences—are executed, displays audio and MIDI tracks that are arranged vertically in different channels and enfold horizontally across a grid-divided time line.[114] This visual representation of the music now arguably influences how we compose it in the first place. For instance, using the cursor to drag and drop chunks of "music" across the timeline of the arrange window encourages us to think about music as consisting of bits and fragments that can be easily shuffled around, rather than as a continuous flow that evolves organically through time. In a sense, digital sequencer programs have virtually materialized musical space and time as musical blocks that can be manipulated, rearranged, and juxtaposed in a nondestructive editable environment.

Though digital technology did not split sounds any further from their sources, digitally converted sounds can be treated very differently than analog sounds, and this, together with the unique sounds digital technology has introduced (which will be discussed later in this thesis), has affected how we make and think about music. In the following chapters, I will use my analyses to argue that this change in practice is significant—so much so, in fact, that the digital merits its designation as a third phase of schizophonia.

The Development of Different Recording Paradigms

A profound enrichment of musical styles and recording paradigms came about as a consequence of the magnetic multitrack tape recorder's increased capacity for manipulating sounds. I have identified three recording paradigms that emerged from this cultural and industrial ferment: (1) the documentary paradigm, (2) the paradigm

[114] For a thorough description of some of the most common visual interfaces of the DAW, see Kvifte, 2010: 214–19.

of ideal performances, and (3) the paradigm of opaquely fragmented performances.[115] These recording paradigms are, of course, often linked to notions of authenticity—a concept that is obviously linked to "truth," although what this "truthness" is about varies according to the context.[116] I will describe each paradigm in turn and briefly discuss the essentially different core values upon which each is based. I will then discuss the fact that while these analytical classifications of recording paradigms were relatively clear cut in practice in the magnetic era, they now often overlap. They remain, nevertheless, perfectly valid as indicators of various, if sometimes coincident, recording paradigms even today.

With the magnetic tape recorder, music makers were able to practice their art in new ways and with a whole new set of tools. Some, however, continued to view the new technology exclusively as a transmitting medium whose main function was to document or archive musical performances. This conservative position, of course, arose from a pervasive reluctance to disrupt the recording's faithfulness to a preexisting performance, which slicing and splicing appeared to do (interestingly, experimentation with physical cut-and-paste techniques was already taking place with optical film in the motion picture industry). Some musicians deplored this operation in particular for ruining the "spirit of the music."[117] The cut-and-paste technique also met with resistance within the field of popular music, as Evan Eisenberg explains: "When splicing did become a possibility, jazz musicians resisted it; as improvisers they believed, even more passionately than old-fashioned classical musicians, in the spontaneity of the long take."[118] For instance, Miles Davis's legendary album *Kind of Blue* (1959) consists *only* of first takes, according to his pianist Bill Evans, and when Davis was forced to use multiple takes in other situations, he did so "without calm."[119] While the documentary approach was less a choice than a necessity in the mechanical era, the magnetic multitrack recorder boasted a range of new

[115] In Brøvig-Hanssen, 2013, I labeled these three recording paradigms of the magnetic tape recorder: (1) the "documentary event," (2) the "ideal event," and (3) the "surrealistic event."
[116] As Richard Middleton points out, authenticity is simply a term for different value claims that identify themselves "in a binary dance of otherness" (Middleton, 2006: 223). For a discussion of some of the diverse reasons for experiencing something as authentic, see, for instance, Keightley, 2001: 131–39; Middleton, 2006: 199–246; Moore, 2002; Taylor, 1997: 22–31; and Weisethaunet and Lindberg, 2010.
[117] For instance, Russian-born classical cellist Gregor Piatigorsky (1903–1976) said, "I don't like splices, I don't like any falsehood . . . I don't like any perfection . . . If the spirit is there, it's good enough for me" (Day, 2000: 26).
[118] Eisenberg, 2005: 122.
[119] Eisenberg, 2005: 122–23.

manipulation possibilities and the documentary approach became an aesthetic choice within a number of alternative approaches. Within this recording paradigm, then, the feeling of authenticity relied on the conviction that the recording was being true to a preexisting performance.

Other music makers abandoned their documentary priorities and embraced the new recording and editing capabilities to create better spatiotemporally coherent performances. It did not matter to them that the performances actually happened as such, but that they sounded good—the sonic result was appreciated regardless of its origins in reality. Here, the feeling of authenticity depended upon whether the audible result of the recording conformed to the traditional musical form or not—that is, to a spatiotemporally coherent performance. An early example of this recording paradigm of ideal performances appears in the recordings of Glenn Gould (1932–1982), the Canadian pianist who has been described as "a passionate champion of splicing" and "a pianist wedded to the record."[120] Contrary to those who were deeply skeptical about the splicing technique, Gould was delighted by the new technological ability to create recordings that were free from flaws and mistakes, and he promptly departed the traditional ideology to construct "perfect" performances out of chopped-up sequences from multiple takes. Unlike those who secretly used the tool to correct minor mistakes, Gould made no attempt to disguise his devotion to virtual perfection: in interviews, he was always eager to discuss his creative process, and at the age of thirty-one he stopped performing live altogether and dedicated himself to recording in the studio. To him, the recording/production medium was not meant to reproduce preexisting performances but to (first) produce sonically and spatiotemporally coherent "performances" that had never happened. Day points out that John Culshaw (1924–1980), the pioneering producer for the British label Decca Records, also "stressed the difference between live and recorded music. He believed that such differences should be creatively exploited, not minimized, that a recording was an interpretation of a musical performance, a musical object in its own right."[121] For instance, in 1966, Culshaw stated that live albums were nothing but "a lazy—and cheap—way to make records" and were useful only as a historical documentation of the work of an artist who was otherwise incapable of making a proper recording.[122]

[120] Katz, 2005: 41; Chanan, 2000: 120.
[121] Day, 2000: 43.
[122] Day, 2000: 55.

While recordings representing a documentary paradigm claim that the performances actually did happen as heard on the recording, recordings within the paradigm of ideal performances represent performances constructed for the recording only. Nevertheless, both paradigms treat the recording medium as a window to imaginable spatiotemporally coherent performances, which distinguishes them from several recordings that took a more opaquely experimental approach to music production.

Music makers who took an entirely experimental approach with the new technology often altogether abandoned the notion of representing a spatiotemporally coherent performance, actual or virtual. Participants in the musical avant-garde movements of the early 1950s (such as Pierre Schaeffer, Karlheinz Stockhausen, and John Cage), for example, harnessed tape splicing in the interests of unique sonic effects, as I will demonstrate in chapter 5. By pushing the new medium to its limits, these composers separated sounds from their "origins" in a way that made obvious their music's fragmented construction and resulted in an *exposure* of the medium itself. Instead of treating the magnetic tape recorder as a transparent window to a coherent musical performance, they transformed it into an enabler of something else: the spatiotemporally fragmented event. Such early experimental techniques were also to be found in the field of popular music. The Beatles are, for instance, famous for their early experiments with backward-playing (the playback of recorded sounds in reverse)[123] and speed alterations of the recording tape, and with tape loops. Similarly, Sam Phillips (perhaps the most influential record producer in the earliest era of popular music) pioneered the "slapback"—a type of echo with a short delay time and only one repetition—at Sun Studio in 1953 or 1954, first with a recording of American blues musician Dr. Ross but most famously in some early recordings by Elvis Presley.[124] Peter Doyle notes with regard to these recordings that "there seems to be little attempt here to create a consistent, believable spatiality,"[125] and Toynbee describes the slapback in Elvis's Sun recording of "Mystery Train" (1953) in a similar way: "The place that we are taken to as we listen is emphatically not a concert hall, bar, or lounge, though. Rather this is a virtual architecture, one that is much 'larger

[123] Analog backward-playing could be achieved either by chopping out a sequence in the tape and replacing it backward, or turning the tape over and running it backward behind the playback head.
[124] Doyle, 2005: 181–83.
[125] Doyle, 2005: 183.

than life.'"[126] Just like the reversal of sound, experimental cut-ups, and tape loops, the slapback abandoned the event-based performance; the recorded music was no longer heard to represent either a preexisting or an ideal spatiotemporally coherent performance.

Since recordings within this paradigm openly acknowledged their technological manipulation rather than attempting to present themselves as something they were not, these performances could also, in a sense, be regarded as authentic. As Lawrence Grossberg points out, the act of revealing the truth about oneself can generate its own sort of self-justification and consequently be experienced as *inauthentic authentic*. He explains: "There are no hidden truths within authentic inauthenticity. Any secret is instantly available and constantly repeated for any viewer."[127] Another alternative is, of course, that the listener's value judgment about the music resides outside the concept of authenticity; within the milieus linked to particular musical genres, authenticity is even an unfamiliar term.[128] Regardless of any notion of authenticity, an observation similar to the one Holmes made about the electro-acoustic music scene also applied to the paradigm of opaquely fragmented recordings: while many found experimental music "a bit too radical for their taste," the influence of this paradigm "began to broaden their opinion about what was and was not musical."[129]

The three musical recording paradigms described above—the documentary paradigm, the paradigm of ideal performances, and the paradigm of opaquely fragmented performances—are still present in a digital environment as well. However, while the documentary paradigm was, in the magnetic era, distinct from the paradigm of opaquely fragmented performances, the two now often overlap; recordings representing opaquely fragmented performances might also represent a documentary paradigm, simply due to the fact that musical live performances might today be just as manipulated as musical recordings. It is to this discussion that I will turn next.

Today, edited recordings likely outnumber strictly traditional recordings, in which nearly all forms of technological manipulation have been rejected. In fact, few

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[126] Toynbee, 2000: 86.
[127] Grossberg, 1992: 226.
[128] While Georgina Born and David Hesmondhalgh have suggested that the concept of authenticity has become an outmoded "buzzword" that has been "consigned to the intellectual dust-heap" (Born and Hesmondhalgh, 2000: 30), it is at least still relevant in several milieus linked to popular music genres.
[129] Holmes, 2002: 116–17.

contemporary recordings are not in fact a constellation of cut-up tracks, and most represent the happiest result from several takes. While the main function of the phonograph was to archive musical performances, the recording/production medium now *partakes* in the final result of the recording and production process—it seldom mediates a preexisting performance but has, to borrow Theodore Gracyk's characterization, become the primary text in and of itself.[130] Yet the documentary paradigm persists, along with its fetishization of the performance's "liveness." This is obvious in the many CD covers, photographs, and music videos depicting artists in a live setting (even those artists who seldom, if ever, perform live); these images imply a performance behind the given recording (or video), for which the consumable product is merely intended to substitute.[131] Anne Danielsen suggests that it is precisely because we have left the phonographic era, in which the recording "could be trusted to be a reliable representation of what it had recorded," that "our desire for the 'real' only seems to have increased."[132] However, the documentation of a live performance (the capture of its liveness) means something different today than it once did.

As Philip Auslander reminds us, the concept of "live music" did not exist until the ability to reproduce music arose to define it in turn: "The category has meaning only in relation to an opposing possibility."[133] Thus "live music" actually means only music that is not manifested as recordings, even though we often invest the notion with certain qualities that we associate with the music that existed before the recording medium was introduced. For instance, "live music" is often understood as a spatiotemporally coherent music performed by co-present musicians; it is, in its purest form, created on the spot, which leaves open the possibility of spontaneous improvisation, as well as errors and traces of imperfection; it involves a bodily co-presence of both musicians and audience and thus a possible dialogue between them as well. Thus, drawing on the qualities that are often ascribed to "live music" by

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[130] Gracyk, 1996: 21. Jonathan Sterne argues that recordings have *never* simply mediated performances, because, in any recording setting, performances have always been constructed specifically for the recording device (Sterne, 2003: 219, 235). Nevertheless, I maintain here that recording was once a legitimate reproduction of *some* kind of performance, in the sense that the recorded sounds could be traced directly to musicians who were playing their instruments at the same time and in the same space (even when the purpose of the performance was solely to be recorded).

[131] For a related discussion, see Gracyk, 1996: 75–78.

[132] Danielsen, 2008: 409.

[133] Auslander, 2008: 56.

listeners, an evocation of liveness might also include the sound of musicians counting off before the music starts or the interaction among them or with their audience during the performance, both of which signify the reality of a performance situation. Similarly, coincidental coughing, calling out, or laughing, as well as some apparent "faults" in instrumental solos, for example, usually signal a single, unique performance rather than an idealized amalgam of several takes. Eisenberg reviews other examples from classical recordings, such as the sound of church bells at the start of a performance that was not even recorded in a church.[134] In *Performing Rites* (1996), Simon Frith describes how both musicians and listeners value and take pleasure in the qualities of process, risk, and excitement, and even intoxication.[135] These things, of course, are often associated with live performances, despite the fact that an artist's seemingly spontaneous behavioral acts or musical "improvisations" during a concert might be carefully calculated and rehearsed. By reconstructing particular qualities, or manipulating sounds in a way that makes them appear relatively unmanipulated, the popular music recording presents itself as being live, so that the listeners feel almost like they are witnessing the performance "in the first person"—though only almost, because the sense of liveness will have decayed in the process of its re-presentation.

While these qualities did fit most instances of live music in the magnetic age of reproduction,[136] today, live music—music that is not manifested as recordings—is as diverse as musical recordings are. While we still have "traditional" live performances of popular music, other contemporary live performances involve prerecorded musical material as well as an extensive use of manipulating tools and signal-processing effects. In fact, the difference between stage performances and recordings no longer necessarily resides in the music itself. While inventions such as microphones, amplifiers, and signal-processing effect pedals have all contributed to altering the constraints of live music, the advent of the public address system (or PA, which includes microphones, mixing console, amplifiers, and loudspeakers) brought about a particularly dramatic change: now, the sounds produced on stage, after being sent to the mixer, could be processed, edited, and placed anywhere in the mix by the sound

[134] Eisenberg, 2005: 92.
[135] Frith, 1996: 232.
[136] There were, of course, exceptions; see, for example, Brøvig-Hanssen, 2013, for a description of the experimental live concerts of the electroacoustic music group Gentle Fire, which was a leading performance group in the 1970s.

engineer. Consequently, the output of the PA speakers at a live performance could be *made to match* a recording. Moreover, the DAW, which was embraced by the music industry in the 1990s, further facilitated the use of programmed or prerecorded musical elements in live performances. Today, a live performance might even consist of nothing more than a single person pushing some buttons on his laptop in order to activate prerecorded music (this describes the performances of the contemporary brostep/post-dubstep musician Skrillex, aka Sonny John Moore, for example). The relationship between live and recorded music is thus no longer technologically determined; live and recorded music may in fact sound identical.[137]

Thus, capturing the liveness of a performance does not have to imply presenting a seemingly unmediated performance. For the same reason, the distinction that is sometimes set up between live and mediated music makes no sense in the case of popular music; few live performances in the popular music scene do not involve technological mediation. Steve Savage discusses what he labels an "it could have happened" aesthetic, alluding to whether the final recorded "performance" could have happened as it is heard.[138] The fact is, however, that in today's mediated environment, everything can happen live.

Nevertheless, although the *music* of live performances may be identical to recorded music, there are important extramusical differences in terms of the music's contextual delivery:[139] live music includes a physical co-presence of musicians and audience so that even if the music is prerecorded, the musicians "performing" it and the audience perceiving it are fully present.[140] This proximity of musicians and

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[137] Auslander points out that the relationship between a live concert and a music recording has become a two-way street (Auslander, 2008: 43), as Jacque Attali noticed already in the mid-1980s: "What irony: people originally intended to use the record to preserve the performance, and today the performance is only successful as a simulacrum of the record" (Attali, 2009: 85; the article was first published in 1985).

[138] Savage, 2009: 32–35.

[139] Here I differ from scholars such as Philip Auslander (2008), who argues that the difference between recorded music and live music has come to an end. Drawing upon Baudrillard's concept of simulation, he states, "Whatever distinction we may have supposed there to be between live and mediatized [here meaning simply recorded] events is collapsing because live events are increasingly either made to be reproduced or are becoming ever more identical with mediatized ones" (Auslander, 2008: 35). For a similar argument to Auslander's, see Wurtzler, 1992.

[140] Of course, as in all "binary" instances, there exists a grey area. In 2011, for example, the Red Hot Chili Peppers concert in Cologne, Germany, was live-fed via satellite to local movie theaters in twenty-four countries across Europe, so that others could witness it in real time even though they were not present there. This is not, of course, the usual way live concerts are experienced.

audience, which distinguishes "live" from "recorded" music, sets in motion what Erica Fisher-Lichte describes as a "self-generating and ever-changing autopoietic feedback loop" of mutual perceive-and-respond actions—the musicians' gestures affect the audience, whose response affects the musicians, and so on.[141] Consequently, even when the music is not spatiotemporally coherent or apparently performed on the spot, a recording can still represent a live performance—even experimental recordings representing opaquely fragmented performances can involve a reinstated proximity, in the sound of a shouting and applauding audience or the dialogue between musicians and audience. Recordings representing live performances thus might give the listener a feeling of *almost* experiencing a star presence, or *almost* taking part in the community of fans listening to the concert.[142]

Just as recordings simulating live performances do not necessarily imply that the music itself is spatiotemporally coherent, recordings presenting a spatiotemporally coherent performance do not necessarily signify a live performance. Some music makers, as discussed previously, care more about the spatiotemporally coherent performance in the abstract than about its putative origins in reality. In fact, much popular music still sounds like a spatiotemporally coherent performance. Consider "We Found Love" (*Talk That Talk*, Def Jam, 2011) by Rihanna featuring Calvin Harris: The music accompanying Rihanna's melodious vocal lines consists of synthetic-sounding synthesizers, sweeping synthesizer pads (a sustained chord or tone with long attack and decay time), trancelike lead pads, and drums that sound both synthetic and programmed. Yet, despite the domination of electronic equipment and the consequent audible acknowledgment of this production's studio origins, the music organically unfolds through time without interruptions; the synthetic instruments and

[141] Fischer-Lichte, 2008: 50. The term autopoiesis refers to "the unique self-producing operations of living systems. While all other kinds of machines produce something different from themselves, autopoietic systems are simultaneously producers and products, circular systems that survive by self-generation" (ibid.: 7). Fischer-Lichte continues, "Self-generation requires the participation of everyone, yet without any single participant being able to plan, control, or produce it alone" (ibid.: 50).

[142] Benjamin defined the work of art's "aura" as the "here and now" (Benjamin, 2008 [1989]: 21) or its "presence in time and space, its unique existence" (Benjamin, 1968 [1936]: 220). If we interpret his "aura" as Michel Chanan does—as "its intimate unity with the time and place of performance" (Chanan, 2000: 18)—then "aura" has much in common with "liveness" here. However, as Peter Johnson points out, "aura" in Benjamin's works signifies less the art's physical presence in time and space than its *perceived* "presence"—that is, "the power of the product to induce a particular kind of response in its observer, one akin to wonderment, and the capacity of the viewer to respond in an active, involved manner" (Johnson, 2010: 45).

the drums represent a coherent flow; and the sonic result is a spatiotemporally coherent performance. As I will demonstrate in my musical analyses later in this thesis, this ideal of spatiotemporal coherence is often played upon in music productions that take an experimental approach, at once sustaining and subverting it.

As I have demonstrated in this chapter, an experimental approach to music production dedicated to exposing mediating technology and its spatiotemporally fragmented construction is by no means a recent phenomenon. However, digitalization has extended the compositional palette of music makers and thus contributed significantly to the aesthetics through which the mediation is exposed, especially with regard to the exposure of the spatiotemporal disjuncture of sounds. While this approach to popular music production will be my focus in what follows, we must always remember that, as Andrew Goodwin put it in 1988 with regard to the (then relatively new) practice of sampling, "the old ideologies and aesthetics are still on the menu."[143]

Conclusion

In this chapter I have argued that the significance of digital technology, beyond the unique sounds and functions it offers (to which I will devote more attention in the succeeding chapters), resides in its accommodation of already established editing operations, thanks to its malleable digital nature and nondestructive editable environments. In effect, digital technology has brought about a third era of schizophonia through its dramatic reinforcement of our tendency to think about music as consisting of bits and pieces that are detached from their spatiotemporal origins.

In the introduction, I drew upon the theories of Hutchby and Gibson to demonstrate that digital technology has affected how music is made via particular affordances. This position skirts both the arbitrariness of radical constructivism, which regards technological artifacts as empty or "open" forms, and the arbitrariness of technological determinism, which holds that technological artifacts impose themselves upon passive consumers. In contrast, I discussed how the perceived affordances of the recording/production media will differ from consumer to consumer as well as from one context to another; by describing some of the different approaches that have arisen within the magnetic and digital recording/production media (the documentary paradigm, the paradigm of ideal performances, and the paradigm of

[143] Goodwin, 1990: 272; the article was first published in 1988.

opaquely fragmented performances), I further demonstrated that technological affordances have always been realized to different extents and in different ways. While some music makers have embraced the changes and experimented with new recording and editing abilities in entirely unanticipated ways, others have used new technology in old ways or according to old ideals. In singling out digital technology's usefulness to an experimental approach in popular music making, particularly in terms of treating space and time as material phenomena that can be manipulated, I do not mean to claim that this is the only branch that blossoms here. Different musical paradigms coexist and strengthen each other thanks to, not in spite of, their differences.

As emphasized in this chapter, before the invention of the phonograph, the only access listeners had to music was through their presence at the actual time the music was being produced, and this constituted the spatiotemporally coherent performance that, in turn, meant "music." Although the phonograph split these sounds from their sources, this conception of music would not begin to change until the mid-twentieth century, when the magnetic tape recorder replaced the phonograph, and it still remains operative for many people today, however processed and/or experimental music has become meanwhile. The deep roots of music's spatiotemporal coherence continue to color our value judgments or notions of authenticity. But they have also profoundly affected our entire musical mindset, often resulting in an unconscious drive to compare what we hear with what we imagine to be a traditional spatiotemporally coherent musical performance. For example, we continue to understand a fragmented musical event as a coherent performance that has been disrupted, even though that performance never existed in the first place. Marc Leman points out that we often attribute meaning through habits or conventions—through our "cultural constraints"[144]—and Albert S. Bregman similarly points to "schema-based" listening, in which learned mental representations of experiential regularities (our mental "schemas") affect the listening process: "Undoubtedly there are learned rules that affect the perceptual organization of sound."[145] Put simply, our ways of listening are informed by our historical and cultural backgrounds. While none of us lived before 1877, the traditional musical form (a spatiotemporally coherent performance) remains with us today.

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[144] Leman, 2008: 56.
[145] Bregman, 2001: 43.

Still, the fragmented musical event is now seldom experienced as shocking; over the past half century, in particular, it has become relatively naturalized due to its frequent appearance, even to the extent that we do not recognize it as fragmented as such (I will return to the notion of naturalization in the ensuing chapters).[146] This tension between the historical/cultural constraints of listening and the liberating processes of naturalization, or "the tuning of the ear," offers compelling insight into the experience of music, as we find ourselves challenged, titillated, and even overwhelmed by the many striking musical forms of technological mediation of our digital age.

[146] For a discussion of processes of naturalization and of Gibson's concept of affordances, see also Brøvig-Hanssen and Danielsen, forthcoming.

Chapter 3

Making Sense of Digital Spatiality:

Kate Bush's Spatial Collage

One of the significant changes in popular music production brought about by digital technology is a new means of fabricating musical spatiality.[147] Musical spatiality refers both to the sonic locations of the sounds within space and to the sonic design of the space itself. In this chapter, I am most interested in the latter. While music makers have been fascinated by and have experimented with this form of musical spatiality for years, to which I will return later, the ease of molding virtual spaces in music with digital reverb and delay effects has given rise to new approaches that reinvent spatiality and sometimes accommodate several distinct reverb and delay effects within the same track.

While digital recording did not become standard in recording studios until the early 1990s, digital delay was introduced to the commercial market already in the mid-1970s, and digital reverb was introduced in the late 1970s and early 1980s. Both effects rely on a conversion of continuous sound signals into binary numbers that are stored in a *short-term* memory, which means that these effects work upon both analog and digital recorded sounds. Delay is here synonymous with echo and refers to discrete and discernible reflections of a sound, while reverb (or reverberation) refers to reflection patterns that are so numerous and dense that they cannot be distinguished perceptually. Both delay and reverb effects imitate the patterns that are produced when a sound is reflected by surrounding walls or other obstacles in actual spatial environments, but they also facilitate spatial designs that differ from natural acoustic designs altogether, such as the gated or reversed reverb, which will be discussed in detail later in this chapter.

I will begin the present discussion by pointing out a few crucial ways in which our experiences with natural acoustics inform our understanding of musical spatiality, drawing upon key aspects of Denis Smalley's theory of source bonding. In order to

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[147] Parts of the theoretical discussions in this chapter appear in, or are revised from, Ragnhild Brøvig-Hanssen and Anne Danielsen (2013): "The Naturalised and the Surreal: Changes in the Perception of Popular Music Sound," *Organised Sound* 18/1, pp. 71–80.

situate digital reverb and delay effects in their historical context, I will then describe how the means of fabricating musical spatiality developed throughout the twentieth century, paying attention to what is new about the digital tools in particular. I will also observe that, from very early on, we can recognize two different paradigms of musical spatiality, one that aims at simulating the ways in which sounds behave in actual spaces, and one that cultivates spatialities that do not exist outside of technologically mediated environments. I am particularly interested in the latter paradigm, because it tends to expose its mediation in an opaque fashion.

As a case study informing my analysis of digital delay and digital reverb as artistic tools and as qualities intended to impact listeners, I will examine Kate Bush's "Get Out of My House" from her 1982 album, *The Dreaming* (EMI). Produced relatively soon after digital reverb and delay were introduced, the music clearly indicates the fascination of Kate Bush and her co-producers for these new effects. In my analysis, I will discuss how the track's sonic design allows for the music to be experienced as surreal, because its musical spatiality clearly differs from any actual physical environment. In my conclusion, I will further observe that this sense of the surreal generally becomes relatively naturalized as we become more familiar with the sonic design that evokes it. I will also discuss how musical spatiality tends to be interpreted metaphorically, either supplying new meaning or emphasizing a meaning that is already conveyed by other musical or lyrical aspects of the track.

In his thorough discussions of how musical spatiality has been fabricated in popular music recordings during the period between 1900 and 1960, Peter Doyle points out that, despite the fact that reverb and echo effects are ubiquitous in contemporary popular music, "questions of how these sonic variables might bring about an affective outcome in listeners have gone largely unasked."[148] I intend to ask at least two of them here: How have the processing effects of digital delay and digital reverb been used as compositional tools in music production? In what ways are these effects experienced by the listener?[149]

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[148] Doyle, 2005: 5.

[149] My focus is on musical spatiality created for a stereo sound system in combination with various forms of digital processing effects (as well as the recording of different actual room ambiences), since this has been and still is the norm in popular music productions. Some of the theories I present in this chapter might, however, also be applied to musical spatiality created by other means, such as, for example, surround sound, ambisonics, and wave-field synthesis (see, for example, Monacchi, 2011).

Conceptualizing and Fabricating Spatiality in Music

In his investigations into the listener's perception of the spatial image of electroacoustic music, Smalley points out that, as human beings, we have a "*natural* tendency to relate sounds to supposed sources and causes, and to relate sounds to each other because they appear to have shared or associated origins."[150] Sounds are, in other words, generally source bonded. A listener might therefore be expected to hear recorded sounds as signs of actual spatial environments, because people in general have a great deal of experience with interpreting sound as signifying space. When a recording simulates (or points to) actual spaces, we draw upon the structure and logic of a previous experience with a particular spatial environment to make sense of the new musical one. In this way, music functions as a "mediator between material and imaginative worlds," as Simon Atkinson puts it.[151] Not surprisingly, then, music makers also often think in terms of creating sonically "virtual spaces" within the music.[152]

In an enclosed physical space, such as a room, sound travels in all dimensions and bounces around as it meets the surfaces of walls, the floor, or the ceiling in turn. The multiple (and multiplying) sonic reflections of the sound gradually weaken as the air and the surfaces absorb them, until they die out entirely. If a sound hits its first surface (preferably a hard one) after fifty to eighty milliseconds (depending on the sound itself), its reflections will be audible as distinct, separated sounds—what we refer to as echo or delay.[153] Enclosed spaces that produce echo might include large empty buildings or wells; outside spaces might include neighboring mountains or tall concrete walls. More common than the echo effect (in non-musical circumstances) is, of course, the effect of reverb—that is, when a sound hits a surface immediately and promptly hits many others as well (a ping-pong effect), producing multiple echoes

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[150] Smalley, 1997: 110. Emphasis in the original.
[151] Atkinson, 2007: 117.
[152] In the present context, "virtual space" simply denotes a spatial environment that, rather then actually existing as physical space, is solely implied by the sound. In the same way that "virtual reality" refers to computer-generated simulations of environments in the "real world" (or in imaginary worlds), virtual sonic space refers to sound-generated simulations. A sonically virtual space, then, is both absent and present at the same time—that is, its presentness derives from our imaginations, when we hear sounds that we interpret as signs of an actual environment. A somewhat different meaning of the term "virtual," based on the philosophy of Gilles Deleuze (1994), is employed in Danielsen's work on the funk grooves of James Brown and Parliament to denote the structural (virtual) aspect of an actual rhythmic gesture (Danielsen, 2006).
[153] Rossing et al., 2002: 528.

that are so dense that the reflections cannot be distinguished from one other.[154] A sound deprived of any acoustic reflection sounds unnatural. The size of the room determines the temporal duration between the source and its initial decay (what is often referred to as the "pre-decay time"), as well as the duration of time before the sound's subsequent rapid and complex reflecting pattern dies out (the "reverb decay time"). The texture of the surfaces in question (concrete, glass, or wood, for example) determines the *reflectivity* of the sounds—that is, the extent to which they are absorbed—which affects the loudness and frequency response of the reflections, as well as the reverb's decay time.[155] As we engage with the acousmatic character of musical sound (whereby the sounds have no visible sources), we recall the sounds of different complex acoustic reflection patterns from previous experience, which in turn allow us to imagine specific actual spaces.

In addition to the sonic design of the space itself, which is primarily constituted by reverb and delay, musical spatiality, as mentioned above, also refers to the sonic locations of the sounds within space, or the spatial organization of the sounds within the music production—that is, within the space between the speakers. This aspect of sonic spatiality is what inspired Allan F. Moore to develop his "sound box" model.[156] He suggests that a sound's frequency register might be conceptualized as its placement in the vertical dimension of the sound box; its location within the stereo image might be conceptualized as its placement within the sound box's horizontal dimension; and its various signal-processing effects, such as delay and reverb, might contribute to its conceptualization as placed in the foreground, middleground, or background of the sound box.[157] What is clear is that the sound box is not a

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[154] The reason why reverb is, in unmusical settings, more common than echo is that the acoustic production of echo—that is, *distinct* sound reflections—requires a very specific architectural design in order to avoid the multitude of sound reflections (which characterize reverb) that are usually created from the various obstacles in a given environment.

[155] Pohlmann, 2000: 633. The sound of the reverb is determined by several other factors as well, such as whether there are any obstacles within the room and what shape and textures these obstacles might have.

[156] Moore introduced his "sound box" model in *Rock: The Primary Text* (1992, revised 2001), in order to account for the organization of sounds various pop/rock productions, mostly "progressive rock" from the 1960s and 1970s. With it, he hoped to map what he sees as "the most important features of the use of this [musical] space"—namely the "holes" or spaces left unfilled. In a more recent work, he has described the sound box as "a heuristic model of the way in which the positioning of sound sources is perceived in recordings" (Moore et al., 2009: 83).

[157] Moore, 2001: 121. Simultaneously, but independent of Moore, Anne Danielsen (1993, 1997) analyzed the results of various production processes employed on Prince's *Diamonds*

description of the virtual sonic space per se but a music-analytical tool that can be used as a matrix to map the spatial placement of the different elements of a mix. Albin J. Zak III points to a similar observation made by the recording engineer George Massenburg, who describes his approach to mixing as a "four-dimensional space." This space consists of three synchronic axes—"the stereo soundstage (width), the configuration of the frequency spectrum (height), and the combination of elements that account for relations of prominence (depth)"—and one diachronic axis—"the narrative assemblage," which refers to the fact that the mix might change over the course of the track.[158] The perceived placement of sounds within the music (and the sound box) is determined by production parameters including relative loudness, microphone placement, dynamic compression, frequency content, ambience, and stereo volume. In my analysis of "Get Out of My House," I will take all of these aspects of musical spatiality into account.

The technological means of fabricating the virtual space conveyed by a musical recording, and of reproducing the sonic atmosphere of actual spaces, have developed since the arrival of the phonograph itself. In the early days of recording, the virtual space was determined solely by the ambience of—and the instruments' placement within—the specific acoustic space holding the performance; few tools existed for engineering anything more. However, due to the phonograph's inability to capture soft sounds and to recreate all frequencies of sounds, the acoustic atmosphere on a recording was very different from that of the recording space. Electromechanical recording, which became the standard recording technology starting around 1925, enhanced the possibilities for amplification significantly, thanks to its conversion of sound into electric currents. Engineers could now capture much softer sounds, allowing musicians to move further away from the microphone and thus strategically occupy more space in the recording environment; in addition, the microphone absorbed more of the room's general ambience as well. The next step toward taking

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and Pearls album (1991) using a similar three-dimensional model, which she labeled with the Norwegian word *lydrom*, meaning sound room, in order to evoke an actual or concrete enclosed environment, such as the space of the recording studio. Danielsen then contrasted her concrete three-dimensional model with the excesses of the virtual environments in Prince's productions. This concreteness—the qualities of an actual space, not an abstract space, against the qualities of a virtual space—is a relevant and useful distinction in the context of the present discussion. Danielsen's discussions regarding the virtual sound room were first presented in her master's thesis (Danielsen, 1993), a shortened version of which was later published in *Popular Music* (Danielsen, 1997).

[158] Zak, 2001: 144–45.

more control of the virtual space of the recording was to carefully choose the architectural frame in which one recorded. In the 1940s, engineers even built "echo chambers" in order to create special reverb effects. The engineer would then place the sound source (an actual performer, or a loudspeaker playing a recorded sound) within this chamber, together with a microphone to pick up the sound and its reflections.[159]

Starting in the early 1960s, when the magnetic tape recorder had become the standard recording medium and stereophonic sound and multitrack recording were well underway, individual musical parts could be recorded separately, without bouncing them onto a single track, and then processed and placed within the mix independent of any other sounds. Engineers created the spatial environments of sounds either by recording the sounds' natural reverb in different spaces (rooms or whole buildings) or by using the new technology of "plate reverb." The principle behind the latter was that the reverb resulted when the amplified electrical currents of the sound signal generated vibration in a suspended thin steel plate. Even cheaper technologies based on the same principle used a spring instead of a plate—thus, "spring reverb." When the artificial reverb effect was to be applied, the sounds would be recorded in a dampened room so as to minimize natural reverb and derive a relatively dry sound, to which the plate or spring reverb could be added.[160] Musicians and engineers at this time also started experimenting with the tape path to create an artificial echo or delay: by adding an extra playback head to the recording machine and combining a reel-to-reel tape with a looped tape sequence, the signal on the reel-to-reel tape could be recorded on the tape loop while it played back. When the tape loop ran through the playback head itself a few seconds later, the sound that had just been heard was repeated. The tape loop then entered the erase head to begin the process again (the length of the tape path from the recording head to the playback head determines the delay time).[161]

Since the digitalization of music-related technology, it has become possible to create artificial reverb and delay in more complex but also more controllable ways. As mentioned in chapter 2, digital delay is produced by storing converted sounds in short-term memory before output following a delay dictated by the user. Digital

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[159] Doyle, 2005: 27. For a thorough discussion of how room ambience has been exploited to aesthetic ends in the process of making records, see Horning, 2012.
[160] For an introduction to plate and spring reverb, see White, 2003: 195–96.
[161] According to Albin J. Zak III, Les Paul was one of the first to experiment with moving the playback head in order to achieve different delay times (Zak, 2010: 317).

reverb has a much more complex design; it is created via various algorithms or mathematical formulas that alter the numerical values of the digitized sound signal in order to simulate all of the different parameters at work in natural reverb.[162] It is built up in a similar way to natural reverb, and thus consists of a pre-decay time, which is the time preceding the sound's initial decay; early reflections, which are relatively discrete; and later, denser reflections. The early and later reflections are often referred to as reverb decay time, or "reverb tail"; see figure 2.

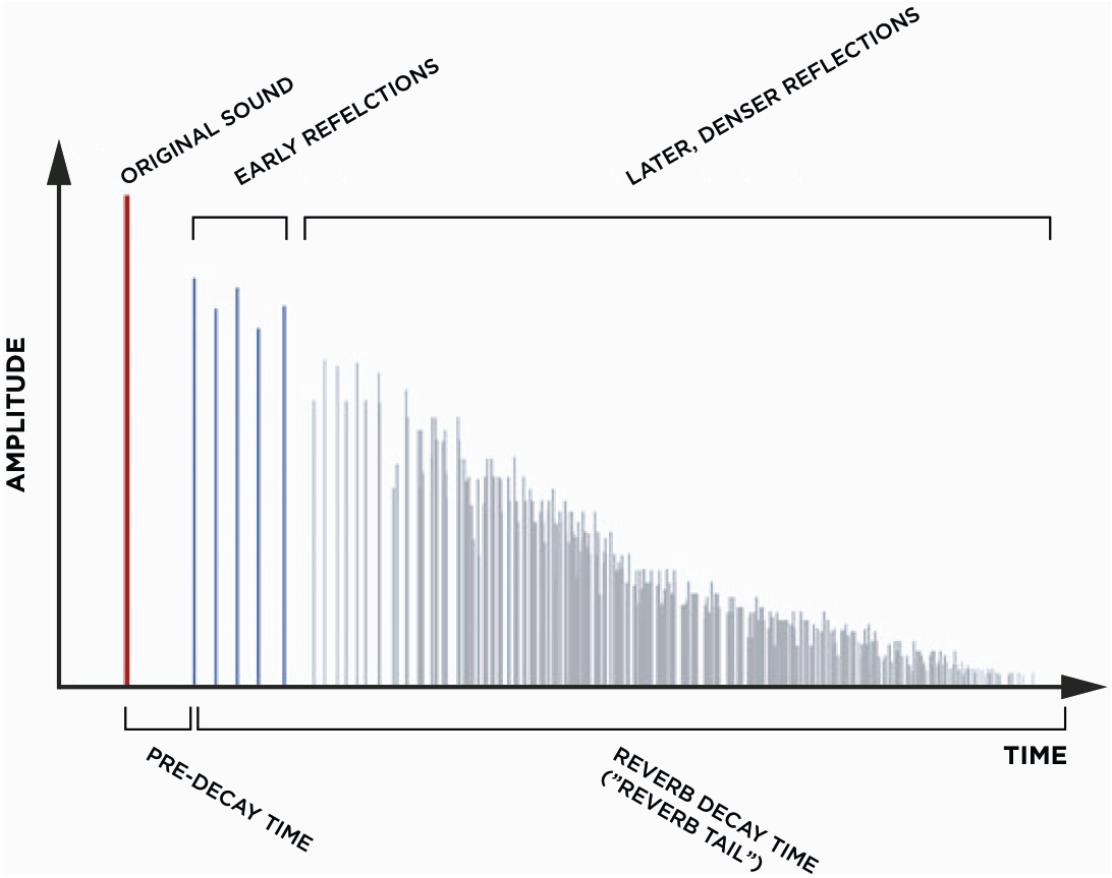

Figure 2: The figure depicts a typical reflection pattern of reverb, and the terms used to describe its different aspects.

Digital reverb can not only reconstruct the timing of these different "natural" reflections but also capture the changes in volume and frequency. With digital reverb's superior access to every parameter of the natural effect, producers had more control than ever before. Since the volume, frequencies, placement, and duration of

[162] For a discussion of this process, see, for example, Pohlmann, 2000: 593, and Proakis and Manolakis, 1996: 1–6.

the reproduced sound reflections could be altered, it was now possible to produce musical spatialities that were more realistic than before (for instance, plate reverb does not have a pre-decay time and thus sounds less natural than digital reverb), as well as producing sonic spaces that were larger or smaller than life, or different from life in other ways, as I will discuss later in this chapter. Moreover, digital reverb was completely clean, in contrast to plate reverb, for example, which added a characteristic metallic ring to its sounds.

From Peter Doyle's analyses in *Echo and Reverb: Fabricating Space in Popular Music Recording, 1900–1960* (2005), it is clear that, very early on, there were two prominent production alternatives for creating musical space. One was to produce a virtual spatial environment that sonically recreated the space of the original recording session, or any other "worldly" space. The other was to produce a virtual spatial environment with features that clearly differentiate it from any familiar actual space. Doyle points to certain music recordings as far back as the late 1940s and early 1950s in which the virtual spaces reveal a "strong sense of 'manufacturedness,'" as he puts it.[163] In Patti Page's "Tennessee Waltz" (1950), for example, the electric guitar goes from reverberant to dry in only two bars in the introduction, while Speedy West and Jimmy Bryant's "West of Samoa" (1954) alternates between "dry" and "wet" verses, which, according to Doyle, "serve[s] to cast the listener in and out of a mysteriously exotic, more than a little threatening soundscape."[164] These pioneering early attempts at spatially "surreal" sound in pre-digital music set the stage for the manifestly greater possibilities inherent to reverb in the digital era.[165]

In the present study, I am particularly interested in the use of reverb and delay effects that diverge from natural acoustic reflection patterns, because they are most likely to be noticed by the listener. Those effects that mimic the real world, in other words, are most often experienced as transparent, whereas those that diverge make obvious their true schizophonic nature—their sounds have been split from their original spatial setting and remade as something else.

During the late 1970s and early 1980s, when digital delay and reverb first came onto the scene, musicians and producers often exaggerated the new functions they

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[163] See Doyle, 2005: 143–62.
[164] Doyle, 2005: 156.
[165] Albin J. Zak III helpfully identifies several other examples of how musical spatiality is experimented with in pre-digital recordings; see, for example, Zak, 2001: 79–83, and Zak, 2012.

offered, lending certain recordings of the time a rather pronounced sonic trademark. Kate Bush's "Get Out of My House" is among those recordings, and I will analyze it here in terms of its exaggerated suggestion of spatial environments that differ from actual environments. Yet I will also demonstrate Doyle's further point that, in terms of music like this, "while flirting with the supernatural," such "surreal" virtual spaces seek nevertheless to "trigger in the listener mental images of coherent, 'imaginable' physical spaces" as well.[166] That is, musical spatiality has a tendency to point the listener toward a "real-world physical phenomenon"[167] even as it acts to undermine that reality.

A House of Surrealistic Spaces

Born in South East London, Kate Bush was in her late teens when she was reputedly discovered by Pink Floyd guitarist Dave Gilmour, who found her a contract with EMI that led to her debut album, *The Kick Inside*, in 1977. She has since managed a long and successful career in popular music thanks to (or in spite of?) her unique and unconventional musical and lyrical ideas, her idiosyncratic singing style, and her involvement in the production process of her music. Her vocal performances are characterized by their extremities, physically and emotionally, and her music is eclectic and experimental, blending traditional rock instruments with ethnic instruments. Most of all, she obviously embraces technological innovations, including electronic instrumentation, processing effects, and experimental production techniques.

"Get Out of My House" is the last track on her fourth full-length album, *The Dreaming*, which caused much controversy for its aggressive realization of Bush's last lyrical line in the album's fifth track, "Leave it Open": "We let the weirdness in." One reviewer of the music blog, Glorious Noise, describes the album as showing "a young women, manic with ideas and creativity, throwing caution to the wind and delivering an off-her-rocker masterpiece that very few artists have ever had the courage to make before or since."[168] Part of the album's renowned "weirdness," of course, is the extensive technological mediation involved in its production.

According to an interview that *Keyboard* journalist John Diliberto did with Kate Bush in 1985, *The Dreaming* was the first album that she co-produced. She took the

[166] Doyle, 2005: 8.
[167] Doyle, 2005: 3.
[168] Totale, 2009.

producer's seat, she said, because she wanted to integrate technological mediation into the musical composition itself:

> By the time the second album was finished, I knew that I had to be involved [in the production process of the music]. Even though they were my songs and I was singing them, the finished product was not what I wanted. That wasn't the producer's fault. He was doing a good job from his point of view—making it sound good and together. But for me, it was not my album, really . . . The more I get involved in the production, then the more I'm going to get exactly what I can out of it. Therefore, it automatically becomes a more demanding and personal project.[169]

With a range of digital equipment at her disposal and the guidance of established producers including Hugh Padgham, Nick Launay, Haydn Bendall, and Paul Hardiman, Bush used *The Dreaming* to experiment with production techniques and exploit obvious signatures of digital mediation.

In the same interview, Bush also indicates that they used the digital Quantec QRS "room simulator," which was introduced in 1982—the year that the album was made and released—to add reverb to the different instrumental and vocal sounds on *The Dreaming*.[170] She was attracted to its improvements around producing spatiality in music: "We have a room simulator called a Quantec, which is my favorite. It would be lovely to be able to draw the sort of room you wanted your voice to be in. I think that's the next step."[171] This would prove true, as several ensuing software reverb effects would offer a graphic interface actually depicting the rooms that the reverb settings simulate.[172]

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[169] Diliberto, 1985.

[170] In the digital era, most professional studios abandoned plate reverb in favor of the new technologies (White, 2003: 196), and Quantec's model QRS from 1982 was among the first and most popular of the digital reverb effects, which also included EMT's model 250, which was introduced in 1976; Lexicon's model 224 from 1978; and AMX's model RMX16 from 1981.

[171] Kate Bush, quoted in Diliberto, 1985.

[172] A case in point is Audio Ease's Altiverb 7 plug-in, which supplies reverb via samples of a variety of actual spatial environments; these reverb presets are then represented in the Altiverb browser by photographs of these environments. One can thus choose among the different reverbs by selecting pictures of various concert halls, cathedrals, recording studios, stadiums, clubs, domestic spaces, cars, and outdoor spaces. Moreover, one can place one's sounds within these spaces. For a demonstration of how this reverb plug-in works, see www.audioease.com/Pages/Altiverb/ (12.01.12).

In "Get Out of My House," the digital reverb and delay present an otherworldly musical spatiality. One reason for this is the distinctive nature of the reflection patterns that Bush applies. The other reason is the track's combination of several different virtual spaces at the same time. While each of these juxtaposed spaces could be heard to simulate an actual space, the sonic collage they comprise could never be experienced in real life.[173]

I will first look at how Bush used these processing effects on the instruments and vocals of the track, then at how listeners might experience the spatiality they set up as diverging from actual spatial environments, then at how the spatiality might be underpinning and being underpinned by the lyrics and the vocal and instrumental performances. In addition to describing the reflection patterns of the sounds and the ways in which they diverge or comply with the reflection patterns of actual spaces, I will also place the sounds and their spatial environments within the analytical "sound box." In my attempt to place the sounds specifically on the depth axis of the mix, I will draw upon Edward Hall's classification of the four "distances" he finds most relevant to social situations in his study *The Hidden Dimension: Man's Use of Space in Public and Private* (1969). The first, "intimate distance," extends up to eighteen inches from a person; the second, "personal distance," extends from eighteen inches to about four feet. The third, "social distance," extends from four to about twelve feet, while "public distance" extends from twelve to twenty-five feet or more.[174] While Hall applied his classifications to human territorial behavior, I will apply them to the apparent physical distances implied within music from the listener to the sounds.[175]

"Get Out of My House" starts with a guitar chord, drenched in reverb, that fades in and then descends in pitch, heralding in turn the instruments that will form the basic accompaniment of the track: the electric guitar, the piano, and the drums (the electric bass guitar does not appear until the first verse). Following the sustained guitar chord, we hear a melodious, heavily compressed electric guitar riff that consists of three

[173] If one walks through the corridor in a crowded hotel, or if one walks along the street in the city at a Saturday night, one might hear different sounds from different rooms or buildings at the same time, but one is never *within* these spaces simultaneously, which describes the effect of "Get Out of My House."
[174] Hall, 1969: 107–20.
[175] Smalley (2007) first introduced Hall's classification of distances to music analysis, and I found the approach particularly useful to my own work with musical spatiality as well (see Smalley, 2007: 41).

played tones per bar but sounds like six tones. This is because a digital delay repeats the played guitar tones after a pause of an eighth note, one time each, as we can see in figure 3.

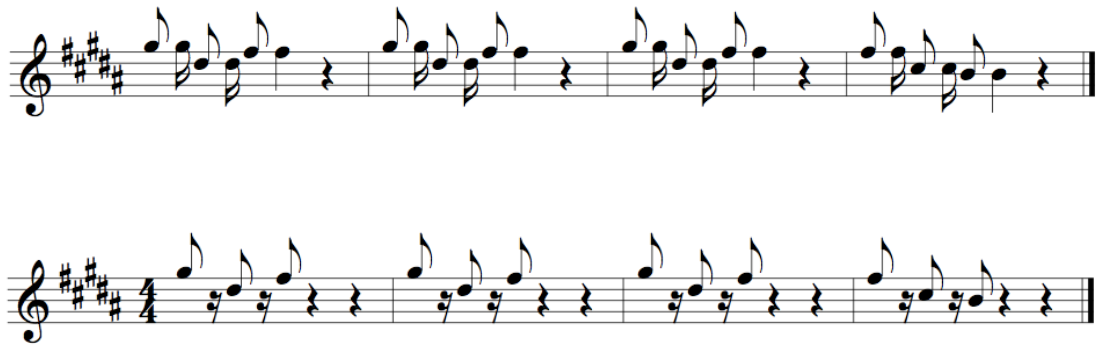

Figure 3: A transcription of what the guitar riff of the introduction sounds like (the delayed sounds have stems pointing down), and what it would have sounded like without delay.

As mentioned, analog tape could also produce artificial delay effects, but not so well or so flexibly. The quality of the digitally delayed sound, for one thing, does not degrade at all, whereas any duplicate of an analog signal always suffers from generation loss.[176] In addition, the digital delay time can be specified within milliseconds but also synchronized to note measures (such as eighth notes), which made it much easier to match the delay effect to the tempo of the music. (The delay time for analog tape is solely determined by the length of the tape path from the recording head to the playback head, which could only be controlled by choosing among multiple mounted playback heads or by altering the position of a playback head mounted on a slide.)[177] Modern digital delay can mimic all of these shortcomings, of course, but more important to Kate Bush and her ilk was its ability to transcend them.

For example, "Get Out of My House" demonstrates Bush's interest in the new and unique delay effect of sonic clones with precise timing. The delay suggested by the guitar sound does not simulate an actual spatial environment; a natural echo would

[176] Watkinson, 1999: 115.
[177] For additional description of the differences between analog and digital delay, see Brice, 2001: 117–20. Other analog forms of delay, such as the Bucket Brigade Delay (BBD), were solid state, but common to all analog delays was the deterioration of the repeated sound's quality.

reveal a lower amplitude than the original signal, and less presence in the upper frequency range. The volume and frequency range of the delayed sounds in "Get Out of My House" are identical to the original guitar sounds, drawing renewed attention to the fact that the riff consists of three played sounds that are delayed rather than six played sounds, which could never be matched so precisely. This guitar riff, then, represents a signature that clearly belongs to the digital era.

This is not the only signature, however: the assortment of sonic environments itself gives the game away. The piano, which is played in a minimalistic, chord-based staccato style, sounds as if it is situated within a small, dampened room, which might be the result of where it was actually recorded or of a digital reverb effect designed to simulate the same. The electric bass guitar, which propels the track's groove with a riff based on eighths and sixteenth notes, sounds dry, as if the bass's output cable had been plugged directly into the mixing console, thus avoiding the natural reflections of the recording room altogether. Contrary to both the piano and the electric bass guitar, the minimalistic but forceful drum part, which sounds like slamming doors (presumably in tandem with the lyrics about slamming doors), seems to have been played in a large and empty room. There is, however, an odd twist to the sound even here: while the reflection pattern of an actual large and empty room involves a long reverb decay time (the period as the reflections fade out), the reverb on the drums in "Get Out of My House" is cut off after only a few milliseconds. Instead of the sound fading into a big space, the space disappears altogether, rendering the "big" sound suddenly dry. The effect is almost surreal, as Zak points out in his description of gated reverb (see more below) as well: "We are immediately taken from the acoustic world as we know it into a strange soundscape of unknown dimensions where sounds behave in unfamiliar ways and the air itself is controlled by machines."[178] The latter feeling emerges from the incongruity between the reverb pattern of this virtual sound room and our familiarity with reverb patterns in actual enclosed environments: reverb usually persists after a sound has stopped, whereas here, the sound persists after the reverb has stopped.

This particular drum sound is referred to as "gated reverb," because it was first achieved with the help of a "noise gate," a processing effect that reduces or eliminates any sound signal that appears beneath a threshold limit set by the producer. In order to

[178] Zak, 2001: 80.

achieve gated reverb using analog technology, one microphone was placed close to the sound source while a second microphone was placed further away (to capture room ambience) within a recording environment chosen for its huge amount of reverb. During playback, the highly compressed ambience track is sent through a noise gate set to a high threshold level, which removes the reverb tail of the sounds, while the relatively dry close-microphone signal plays normally. Hugh Padgham, one of the most sought-after British producers of the 1980s, is famous for pioneering this effect using analog technology, first on the drums on Peter Gabriel's third solo album from 1980 (*Peter Gabriel 3 [Melt]*, Charisma/Mercury/Geffen) but more famously on the drums on Phil Collins's 1981 hit "In the Air Tonight" (*Face Value*, Virgin/Atlantic).[179] Padgham also contributed to the production of Kate Bush's "Get Out of My House," which might explain the choice of drum sound here.

Though the gated reverb could be produced with analog technology, it is more strongly associated with digital technology, because it is so much easier to create there. While an analog gated reverb effect required an actual large recording room (for "In the Air Tonight," engineers not only built such a room but also covered all of its surfaces with stones),[180] the digital effect involved only algorithms. Instead of juggling microphone placement and manipulating playback equipment, in addition, engineers could simply reprogram the digital information to remove the reverb tail.[181] Digital reverb effects soon arrived with a "gated reverb" preset, and it was used on countless recordings during the 1980s, particularly with the drums, as Mark Cunningham points out: "Ambient, gated drum sounds proudly reigned throughout the Eighties to the point when artists and their producers stressed the importance of such qualities to almost obsessive levels."[182]

A third typically digital effect that reveals the spatiality's manufacturedness in "Get Out of My House" can be heard on the vocal passages between 00:58–01:00 and 2:14–2:16 (min:sec)—namely, reverse reverb, that is, a reverb pattern performed backward (as the source sound is played forward). An engineer could also achieve

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[179] For a description of how Hugh Padgham created the gate reverb effect using analog technology, see Cunningham, 1998: 322–28, Zak, 2001: 79–81, or hear Padgham explain it himself in a TV interview with George Shilling, available at www.recordproduction.com/hugh_padgham.htm (10.11.2012).
[180] Cunningham, 1998: 325.
[181] For a description of how digital gated reverb functions, see White, 2003: 202–4.
[182] Cunningham, 1998: 322. For a discussion of how gated reverb is used in Prince's music, see Danielsen, 1993 and 1998, and Brøvig-Hanssen and Danielsen, forthcoming.

this effect with analog technology by placing a tape bit with recorded sounds on the tape recorder backward, then adding reverb to it as it plays in reverse. When the engineer then flipped the tape on the recording machine so that the sound played forward again, the reverb would be playing backward. This effect was obviously much easier to achieve by reprogramming digital information, and it became much more common as a result.[183]

In addition to its use of reverb patterns in ways that diverge from any naturally produced acoustic reflections, "Get Out of My House" represents a spatial collage. William Moylan points out that our spatial "imagination" when listening to music is influenced both by the sonic characteristics of each sound and by the overall sound created from those individual sounds. Writing from the perspective of studio production, Moylan also points out that producers are usually conscious of both of these levels of sonic spatiality:

> In current music productions, it is common for each instrument (sound source) to be placed in its own host environment. This host environment of the individual sound source (a perceived physical space) is further imagined to exist within the perceived performance environment of the recording (space). This creates an illusion of a *space* existing *within* another *space*.[184]

Each individual sound occupies a subspace within the music's all-encompassing spatial environment. Smalley similarly observes that the "holistic" space of the music comprises "zoned spaces," and possibly also sub-zones.[185] Even when a musical production is in fact a montage of zoned spaces, it is not always heard (or intended to be heard) as such. But sometimes it is precisely the point to generate the effect of superimposed spaces. Smalley describes this as a *spatial simultaneity*—that is, an occasion when "you are aware of simultaneous spaces" in the music.[186] Compared to the pre-digital process of recording the reverb of actual spatial environments, digital technology made it very easy to produce a musical collage of different spaces, partly thanks to the reverb effect's presets (pre-programmed digital algorithms) simulating different spatial environments. These presets, which were labeled after the room or the reverb they tried to simulate (such as "cathedral," "large hall," "medium hall,"

[183] For a description of reverse reverb, see White, 2003: 202–4.
[184] Moylan, 2002: 176–77. Emphasis in the original. See also Moylan, 2012.
[185] Smalley, 2007: 37.
[186] Smalley, 1997: 124.

"large room," "small room," or "plate reverb"), and which one could further adjust as desired, allowed one to freely experiment with a wide range of reverb at the push of a button. By facilitating the creation of spatiality in the music, digital reverb encouraged the collage aesthetic that characterizes "Get Out of My House," and in particular its vocal sounds. I will describe the different spatial environments of that vocal collage in what follows.

The lead vocal appearing in the first verse and the first chorus (0:13–0:46) reveals a "slapback" effect with only one repetition, which is not very distinct but still contributes to the overall sound of the voice. As mentioned in chapter 2, "slapback" is basically an echo with a short yet perceptible decay time. While, for instance, the slapback echoes of the lead vocal in Elvis's "Mystery Train" (1953) were quite distinct, those applied to Bush's lead vocal here appear in a grey area between what can be discerned as actual slapback and what might instead be heard as fattening the sound. In addition to this particular slight delay, this vocal sound has a reverb whose reflection pattern suggests a relatively large, empty hall full of hard surfaces, such as concrete or stone. The reverb is in stereo, which gives the impression that this large concrete hall in fact surrounds us. The lead vocal reinforces this impression. It sounds as if it were recorded or "dubbed" three times, whereby one of the takes is placed in the middle of the horizontal axis of the sound box, or mix, while the other two are placed left and right (approximately forty-five degrees either way). The vocal sounds as though it is within our "personal" distance—that is, according to Hall's categorization, between eighteen inches and four feet away—making Bush seem very near indeed.

Somewhere in the distance of this immediate space, during the same sequence of the track, the backing vocal suggests another zoned space as it shouts "slamming!" and "lock it!" Like the lead vocal, this vocal also sounds as if it were dubbed (recorded two or more times), but here the takes are centered on the left-right stereo axis but placed behind the lead vocal in the mix. They are probably recorded with a microphone placed a set distance from the singer; in combination with the reverb, as well as other parameters such as volume, compressor, and frequency settings, this makes the backing vocal sound generally less distinct than the lead vocal. It also sounds as though it is within our "public distance," or from twelve to twenty-five feet (or more) away. While it does not have a slapback echo as such, the backing-vocal

sound bears traces of being reflected by a hard surface—a tiled basement, perhaps. The reverb is also in mono, which makes the space sound more contained.

At 00:46, we are suddenly moved to another spatial environment via a different lead vocal that speaks with an exaggerated cockney accent within our "social distance" (of four to twelve feet away). The vocal performance is drawling and nasal, the latter association strengthened by a volume boost on the frequencies that produce nasality (1,000–2,500 kHz). The sound's short pre-decay time (the time before the sound reaches its first obstacle) and short reverb decay time suggest a small room with surfaces that absorb most of the reflections that constitute the reverb. Yet we also hear some percussion sounds in the distance at this point, sounds that suggest a much larger room beyond the vocalist's own room. The fact that both the vocal sound and its reverb is placed hard right in the stereo field, in contrast to the piano and guitar that also are present at this time, contributes to this feeling of a room within another.

A male vocal interjects upon the cockney vocal part, demanding "Let me in!" (0:54–0:55) and furthering the impression of a spatial collage: it is placed hard left in the stereo field and appears to be situated within our personal distance once again. Its pre-decay time and reverb decay time are so short that the listeners might not even notice the reverb—the male voice sounds almost completely dry. This suggests a small, dampened space designed to minimize the natural reflections of sounds.

During the track's bridge at 1:03–1:30, a forth version of Kate Bush's voice appears. With no slapback, no nasality, and no hard reverb reflections, this vocal sounds much cleaner and more like an "everyday voice" than her previous incarnations. This vocal part has a relatively long pre-decay and reverb decay time, suggesting that the sound has traveled a significant distance before being reflected by the room's surfaces—hence, from a room of considerable size. However, since the mix is so dense with other sounds, these reflections virtually disappear in the periphery of the mix. While reverb often cause sounds to seem to be further away, this vocal's relatively long pre-decay time belies that sense; because the time before the sound meets its first obstacle (the initial decay) is rather long, the sound is not defused by its own reverb but remains clean and clear so as to sound very present and "up front." Similar to the slapback vocal, this vocal is placed within our personal distance, but not in stereo—instead, it appears to be placed directly before us.

The many spatial environments suggested by the vocal sounds of "Get Out of My House," some of which were described here, demonstrate what Smalley describes

as a space-form process that is "occupied with multiple spaces, mixed materials, possibly intercuttings, dislocations, and impressions of simultaneous spaces, although the final view could well be an holistic one."[187] When we listen to music suggesting a spatial collage, we do not draw upon any given experience with a particular space but rather attempt an awkward synthesis of a number of such spaces. As we project these previous "real-world" experiences onto a single virtual environment, we hear the music in question as unnatural or surreal and opaque, because it clearly signifies a spatial environment that could never occur in a real, physical, technologically unmediated environment. While this effect is not unique to digital reverb as such—it could be recreated by capturing different analog sounds in different spaces and emphasizing this diversity in the mix[188]—the ease of creating it digitally has turned popular music in the general direction of the sonic collage to an unprecedented extent.

A House of Terrifying Spaces

As Doyle (2005) and Serge Lacasse (2000) point out, musical spatiality evokes actual spaces but also *metaphorical* ones. For example, a certain kind of reverb might indicate both the emptiness of an actual physical environment *and* the "emptiness" of despair, for example.[189] In "Get Out of My House," the sonic collage brought about by the production's copious digital delay and reverb effects emphatically influences the listener's interpretation of its musical meaning.

In an interview, Kate Bush revealed that "Get Out of My House" was inspired by Stephen King's horror novel *The Shining* from 1977, which was adopted into a film of the same title, produced and directed by Stanley Kubrick, in 1980, two years before Kate Bush released *The Dreaming*. The novel is about a man named Jack, who, in an attempt to escape his troubled past and start over, takes a job as caretaker at an isolated resort hotel and moves there for a snowbound winter with his wife and son. Trapped there, in effect, Jack is then possessed by a supernatural force or ghost that lives in the hotel, and his ensuing detachment from reality culminates in his attempt to kill his wife and son. A reprint (available online) of Kate Bush's self-authored article in issue 12 of *The Garden* in 1982 indicates that she related the story

[187] Smalley, 2007: 54.
[188] For instance, Portishead's "Half Day Closing" (*Portishead*, GO! Beat Records) from 1997 is an example of sonically simultaneous virtual spaces, which were produced by recording natural environments and using analog processing effects. For an analysis of this track, see Brøvig-Andersen, 2007 and Brøvig-Hanssen and Danielsen, forthcoming.
[189] See Lacasse, 2000: 179.

of *The Shining* to the atmosphere she wanted to capture in "Get Out of My House": "*The Shining* is the only book I've read that has frightened me. While reading it I swamped around in its snowy imagery and avoided visiting certain floors of the big, cold hotel, empty for the winter."[190]

The many rooms, corridors, and doors that appear both in the sound production/effects and in the lyrics of "Get Out of My House" could certainly evoke associations with a hotel. The track's powerful and complex musical spatiality could also work metaphorically, however, expressing other *Shining*-related sentiments around a person haunted by her past, or a person chased after or invaded by another person/being, or a person struggling with an inner conflict. In "Get Out of My House," the vocal performances, lyrics, instruments, and processing effects combine to generate a musical meaning that is much more powerful than the sum of its parts, a meaning that is as impressive as it is, appropriately, horrible.

Through her theatrical vocal performance, Kate Bush captures several characters and a huge range of emotions during the track. The first character appears in the first verse and chorus of the track (0:13–0:46), which I described as the "slapback vocal." The lyrics here suggest that the main character of "Get Out of My House," hereafter referred to as "she," is frightened by a man, and Kate Bush's sensitive delivery conveys fear and misgiving. The impression that the follower is a male follows from the masculine-voiced interjections as well as a dialogue between Bush and a man toward the end of the track; of course, this man might symbolize any person, demon, or otherworldly phenomenon that she fears. The lyrics associate the fear with the other's potential for instability, either mental or physical: "When you left, the door was slamming / You paused in the doorway / As though a thought stole you away / I watched the world pull you away." She is frightened so she "run[s] into the hall" and "into the corridor." She is looking for a "door in the house" as she listens to "the lift descending" and sees "the hackles on the cat standing." She finds the door and "lock[s] it" with her key.

As mentioned, the slapback echo and the "hard" reflection surfaces of the voice's reverb give the impression that this person is located in a large, empty building, such as a deserted hotel or storehouse. Because horror movies and TV shows often exploit such buildings, these reverb and slapback effects in turn play

[190] See gaffa.org/garden/kate14.html#house (12.01.12).

neatly into the scary ambience of Bush's lyrics and vocal performance. The slapback echo also manages to make the otherwise resolute vocal sound broken or vulnerable, as if the character was shivering. Because the vocal is dubbed and spread across the stereo field, the fear it expresses surrounds, even immerses, us.

As mentioned, the drumbeat sounds like slamming doors that are processed with gated reverb. This processing effect suggests the resonance of a large hall suddenly reduced to nothing, as if a door has been closed (though the sonic result here is in fact very different from what it would be in reality). Interestingly, one of the "doors" within each bar—the eighth note before the downbeat (or the "one")—does *not* reveal gated reverb but instead a relatively dry sound, and it is panned hard left. The result of this discrepancy is that while the other doors seem spectral as they slam in the "background," this door sounds like it is very near to us, and thus very concrete or even real. It is a jarring, unsettling alternative to an already unpleasant and eerie atmosphere. The persistent thumping and minimal pattern of the drums also suggests the stopping and starting of a beating heart, while the electric bass guitar's monotone riff on eighth and sixteenth notes suggests a racing pulse that we feel as much as hear, thanks to the dry sound of the strings.

At 00:47, we are introduced to another character (and another spatial and musical environment), as mentioned above. Like an actress, Kate Bush changes her vocal style completely to a nasal drawl with an exaggerated cockney accent, blurting out, "I am the concierge chez-moi, honey / Won't letcha in for love, nor money." The change of "scene" is also emphasized by the new musical spatiality. Up to now, Bush has been telling us a story about someone she fears (using an accusatory second-person "you"); here, though, we seem to see her from outside, the way the man (or the "you") sees her. She speaks defiantly, nonchalantly, despite the man who interrupts her with his demanding "Let me in!" The sounds of slamming doors have become more diffuse (due to a change in both relative loudness and reverb effect), as if the music now manifests the narrator's attempts to dismiss her pursuer.

If we thought that she (or we, given our general tendency to embrace characters portrayed in music) were protected from the man by a locked door, as the lyrics imply, we are next shocked to hear his voice right beside us—its dry sound suggests a placement within our personal distance. This house begins to appear metaphorical rather than actual—perhaps it is her body or psyche, and the keys/locked door are symbols of her inner struggle against the intruder. She ignores him, regardless of the

apparent proximity: "I'm barred and bolted and I—" At this point in the sentence, which concludes "—won't let you in," the voice is drenched in the reverse reverb described earlier. She sounds suddenly like she is drowning, either in her own fear or even in real life, if the man has in fact attacked her. This voice is helpless and diffuse, yet we sense rage as well. She has not given up yet. This anger is boosted by a distortion effect that is added to the vocal, as well as a dubbed backing vocal(s) shouting furiously from elsewhere in the track's eerie spatiality: "Get out of my house!"

Between 1:03 and 1:30, Bush takes on a third character who sounds at once more resigned and dejected but also somehow resolute as she sings: "No stranger's feet / Will enter me / I wash the panes / I clean the stains away." The reverb on this new voice pulls the narrator into her own inner space, in contrast to the outward focus of the vocals in the verse and chorus. By removing the slapback echo and changing the reverb from a reflection off a hard surface to a reflection off a softer one, the character leaves the house built sonically of stone and enters a new spatiality that is somehow warmer in character and possibly somewhat smaller, like moving from a sprawling, unfinished basement to a living room. The new dreamy atmosphere is strengthened by the changes in time signature during this musical section, as well as the sustained chords played by the piano and the delayed electric guitar, all of it still propelled by the pulsing bass guitar and forceful door-slamming rhythms of the drums.

As the music progresses, the sections with the frightened "slapback character" of the verse and chorus, then the concierge character, then the resigned but resolute character cycle through in the same order but build emotionally. For example, the "slapback character" starts to stutter in a rhythm supported by a dry (not delayed) electric guitar riff: "This house is full of m-m-my mess / This house is full of m-m-mistakes / This house is full of m-m-madness / This house is full of, full of, full of fight!" As this character continues to oscillate between fear and confidence, weakness and hardiness, resignation and resolution, the dubbed backing vocal(s) from faraway sounds more and more furious and desperate as it repeats "Get out of my house!" When the man interrupts the backing vocal toward the end of the track, demanding to be let in, it gives way to a piercing scream, as if to signal physical or mental violation.

The track ends with a melodious dialogue between the man and the woman (3:13–3:48). The man starts by singing softly and almost gently: "Woman let me in /

Let me bring in the memories / Woman let me in / Let me bring in the devil dreams." He sounds less demanding and threatening than before, partly thanks to the light guitar melody behind him. Yet there is unease, obviously, in his promotion of "devil dreams." The woman answers him politely but firmly: "I will not let you in / Don't you bring back the reveries / I turn into a bird / Carry further than the word is heard." He persists, in a voice saturated with reverb but placed within our intimate distance range. In this case, a relatively long reverb decay time preserves the sound's definition, but it is also clear that the vocalist stood quite close to the microphone during recording and the voice has been further processed with a compressor. Every breath, swallow, and random throat noise is audible. Lastly, the male voice is dubbed (recorded two times), and a take is placed hard left and hard right, respectively, so that he sings directly into our ears. While we know that he is addressing the woman in the music's narrative, we are made very aware that we have *become* her as we are sonically overwhelmed and invaded.

The woman's voice is just as present as the man's, however, so we become him as well, in a sense, as we listen to her. Though she sings calmly, her voice sounds fragile and brittle: "I'll turn into a mule," she warns. His voice becomes sinister as he responds, "Let me in!" This opening of hostilities is reflected in his voice, now panned hard left and almost free of acoustic reflections, as if he has departed the music itself and now stands right next to us.

While at first the "mule" seems to suggest only her resistance, soon it becomes something more, as she starts literally braying or bellowing in agony between loud intakes of breath. This mule sounds abused or at the very least overtaxed. After a time, the man takes over the braying and Bush's voice disappears for the rest of the track. The man's performance of the "mule language" has a very different character than Bush's: there is triumph rather than agony or fear, and the heavily compressed, intermittent breathing sounds that are added atop the braying (and within our intimate distance) sound almost erotic. This conclusion, then, brings with it very troubling undertones of sexual assault or a very painful spiritual possession.

Alternatively, however, we might hear the "male" roaring as the woman's own battle cry, as she claims yet another (victorious) voice after having scared her intruder away. The track ends with a male choir reciting syllables from the Indian drum language Kannakol: "Dha dhin; dha ga ta; ta ka dha dhin; ga ta; dha dhin; ka dha; da

ka; dha dhin; dha ga ta . . ."[191] We can only guess, then, whose triumph these talking rhythms are intended to accompany.

Conclusion

As we have seen, digital reverb and delay effects are able to generate aesthetic meanings of their own as well as underpin the meaning communicated to the listener by other musical aspects, such as the lyrics and vocal performance. The work of Kate Bush and her production team to exploit the possibilities of these then-new technologies made "Get Out of My House" the track it is. While some of their effects could have been achieved with analog technology, digital-era possibilities simplified, encouraged, and ultimately standardized these effects in a remarkably short time, as this track clearly demonstrates.

The ability of delay and reverb to create virtual spatial environments is premised on the listener's tendency to compare the musical sounds to those produced by actual physical spaces. One possible consequence of this tendency is an unbalancing sense of surreality in the face of effects that are unlikely, to say the least, in the real world. For example, the digital delay in "Get Out of My House" clearly differs from any naturally occurring delay, as described above, and the same goes for the gated reverb, reverse reverb, and general spatial collaging in the music. This may be one of the reasons why several journalists described "Get Out of My House" as bizarre, odd, weird, and surrealistic.[192] Bush's mediation draws attention to itself and comes forward as quite opaque—the *spatial* schizophonia of "Get Out of My House" is obvious in the split between its sounds and their putative spatial origins.

Although the spatiality of "Get Out of My House" was almost certainly experienced as surreal upon its release, sonic designs such as Bush's generally tend to become relatively naturalized with the passage of time. The reason for this, as discussed in chapter 1, is that our ears "tune to" or adjust to new sonic environments with dispatch. As we adjust to new musical expressions brought about or inspired by new technologies, we come to hear them as appropriate—even "natural"—and we will then judge the next round of innovations against them. Any given experience with a musical environment promptly becomes a reference point as we structure and

[191] Konnakol is the basic language related to the sounds of the Indian *mridangam* drum, in which each syllable (*solkattu*) represents different drum strokes, but Kannakol has also become an individual art form. See Young, 1998: 12, 23.
[192] See, for example, Hamlow, 2003; and Mitchner, 2011.

comprehend the next environment. Or, as Smalley points out, "The perspective of the acousmatic image has evolved its own conventions."[193] Relevant here as well is James J. Gibson's observation that the same environment might afford different things in different contexts,[194] as mentioned in chapter 1. If we compare the sounds in "Get Out of My House" to actual spaces, the music will certainly appear surreal. If we compare it to other tracks like it, especially from the early to mid-1980s, it will sound less remarkable (though certainly virtuosic nevertheless). The experience of musical spatiality as natural or surreal thus depends on the frame of reference within which we meet its affordances. Instead of pointing to an inherent quality of the phenomenon in question, then, the impression of something as surreal or natural tells us something about what we are comparing it to.

While Kate Bush's music likely disturbed the early 1980s sensibility regarding a "natural" sonic environment, today we have become very comfortable with the juxtaposition of different sonic spaces in music. Even so, the music's surreality might persist for us now. Our comparison of the virtual sonic environment of a recording *both* to actual spatial environments and to contemporary naturalized musical environments presumably generates the richness of our experience with music like this. Even though we know that anything goes here, we still enjoy the way opaque mediation flouts consequence by evoking our familiarity with real physical spaces even as it subverts it.

[193] Smalley, 2007: 49.
[194] Gibson, 1986: 128.

Chapter 4

The Rebirth of Silence in the Company of Noise:

Portishead's Lo-Fi/Hi-Fi Music

With digital technology, silence was reborn. While analog media presented us with silence of a sort, at least when compared to the sound quality of electromechanical media, digital silence, in the fashion of John Cage's *4'33"*,[195] made obvious all of the noise that we had previously ignored there. Before the introduction of digital technology, recorded sounds had always been enmeshed in the noises inherent to the mediating process. Digitally recorded sounds, on the other hand, had *no* noises accompanying them, and consequently, digital silence took us to a "musical" place we had never been before. Reducing the distraction of background noise and improving sound quality have always been motivating factors behind new developments in sound reproduction technology, and with its total silence, digital recording thus represented a dramatic change in this narrative of audio progress.

While digital recording technology's fidelity to a sound's source seemed perfect, the digital medium was not universally regarded as the perfect medium for recording music. In a countercultural reaction to the musical embrace of high-fidelity sounds, several musicians went lo-fi, exploring the unique sonic signatures of various pre-digital recording and playback media, instruments, processing effects, and other musical equipment. As Joseph Auner (2000) and Stan Link (2002) point out, the practice of exploring and reacquiring noises and lo-fi sounds from pre-digital eras was very common in the 1990s. Still, this trend did not necessarily imply a complete rejection of the digital but rather a counterpoint to it. As I will discuss in this chapter, the digital signature was sometimes even explored and exposed on its own terms, silent or otherwise. And various combinations and interminglings abounded: the old sounds were often put into a digital frame, for example, allowing us to hear them

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[195] John Cage's *4'33"* (1952) is an instrumental piece that consists of four minutes and thirty-three seconds of "silence"; the instrumental performer plays nothing. According to Thom Holmes, Cage explained that the point of the piece was that "true silence does not exist and that one could realize this by only opening one's ears" (Holmes, 2008: 397–98).

anew. By providing a new basis for comparison, the silence of the digital in effect reintroduced analog's various forms of noise.

In this chapter, I will first situate the digital signature of total silence in a historical lineage, representing it as a radical departure from earlier recording and playback technologies. Next I will point to how digital silence encouraged the aforementioned schizophonic tendency to revisit media signatures from the past. I will then analyze "Strangers" (*Dummy*, Go! Discs/London, 1994) by Portishead, a Bristol band active in the 1990s whose members are often described as pioneers of the lo-fi musical movement or style referred to as "trip-hop." My focus will be on the ways in which these musicians explore pre-digital media signatures while simultaneously positioning themselves as avid practitioners of digital mediation.

Digital Silence and the Holy Grail of "High Fidelity"

Thanks to its historical impossibility, total silence is one of the most characteristic signatures of digital mediation. It looms large in the context of the cultural and historical quest for complete transparency in the technical mediation process—that is, the holy grail of "high fidelity" (hi-fi), or accuracy to the sound source.[196] While the term itself was first coined in the late 1920s or early 1930s,[197] a concern with the fidelity of sound arose even earlier, as we can see in a 1915 publication for Edison dealers:

HANDLING A CUSTOMER IN THE STORE

[196] "High fidelity"—literally, a musical reproduction's fidelity or truth to a source—is in fact a problematic notion, because, from the term alone, it is not obvious what this "source" is. There are two possibilities—either the reproduced sounds are true to the original sounds, or the sonic event represented by the reproduced sounds is true to an external event. While the latter is obviously linked to the first, the first is not necessarily linked to the latter. For example, the fidelity to a preexisting performance represented by a phonographic recording was actually quite high, in the sense that there were hardly any options for editing or manipulating the recorded material afterward. Therefore, one could trust that what one heard on the recording had indeed existed. The phonographic *sounds*' fidelity to the original sounds was, on the other hand, quite poor, because of the recording medium's characteristic noise and limited capacity to capture the range of frequencies and dynamics. On the contrary, while the *sounds* of a digital recording may be quite faithful to the original sounds, the recording is likely not very trustworthy in terms of representing a performance that actually happened. Scholars often ignore these alternative implications of "high fidelity," which blurs their arguments. Here, I will reserve the term for the mediated sounds' fidelity, or transparency, to the original *sounds*, and the same applies to my discussion of lo-fi music. (For a similar observation about the implications of the term "high fidelity," see Zak, 2012.)

[197] See Symes, 2004: 73, and Morton, 2006: 94 (who seem to disagree slightly about when the term was introduced).

> SHOPPER: Do you claim to have something better than the Mineola?
> MR. BROWN: Comparisons are always odious. The Mineola has no superior—in the class to which it belongs. The Edison Diamond Disc is a more expensive instrument and in quite another class.
> SHOPPER: Is the Edison tone equal to the Mineola tone?
> MR. BROWN: The Edison has no tone.
> SHOPPER: No tone?
> MR. BROWN: Exactly that. Mr. Edison has experimented for years to produce a sound re-creating instrument that has no tone—of its own . . . If a talking machine has a distinctive tone, then such tone must appear in every selection, whether band, orchestra, violin, soprano, tenor or what not. In other words, there is a distortion of the true tone of the original music.[198]

This claim of the complete erasure of the phonographic medium's self-presentation today appears preposterous; when listening to recordings from this early period, we are as likely to focus on the sheer level of noise and poor sound quality as we are on the music itself.

The noise of the phonograph, of course, derives from its very construction. A recording horn captures and concentrates the performed sounds, and a diaphragm (membrane) placed at the end of the horn vibrates in response to the sound waves (just like the ear's tympanic membrane). A stylus (pointed tool) that is connected to the diaphragm moves in line with the diaphragm's vibrations, cutting a groove similar to the vibration patterns of the actual sound waves into a wax cylinder or disc. The phonograph thus relied upon the conversion of one motion into another via physical contact, and it was that contact (between stylus and cylinder) that produced the significant background noise. It was not only the noise, however, that limited the phonograph's sonic fidelity to its sources—sounds that were too loud could make the recording needle jump and consequently damage the wax, and sounds that were too quiet would be missed altogether. In addition to this limited dynamic range, the phonograph could accommodate only a limited frequency content. While the human ear is capable of perceiving sound frequencies between 20 Hz and 20 kHz, acoustic recording could only capture and reproduce sound frequencies between 168 and 2,000

[198] Quoted in Thompson, 1995: 144.

Hz.[199] Given these limitations, recording engineers experimented with the positions of the instruments and singers in relation to the recording horn and even adjusted the musicians' styles to produce more audible dynamic shifts. Sometimes they modified the instrumentation itself: the felts of a piano's hammers could be filed down, for example, in order to make the sounds piercing enough to be captured by the recording device, and a tuba could be substituted for a double bass for the same reason.[200] Thanks to the phonograph's narrow frequency content and dynamic range, a performance that was originally rich and powerful could sound poor and thin on wax. Eventually, this combination of characteristic background noise and limited sonic range came to constitute the material signature of the phonograph as a recording medium.

This material signature became truly apparent in the context of the medium's successors, the first of which was electromechanical recording, which became the standard recording format after 1925. This recording medium replaced the recording horn of the phonograph with a condenser microphone that converted sounds into electric currents, and those electronically amplified currents, not a diaphragm's vibrations, drove the movements of the stylus, or cutter.[201] Nevertheless, the physical contact between stylus and cylinder remained, and therefore so did the background noise. But the advantage of transforming sounds into electric currents lay in the process's enhanced capacity for amplification, which in turn broadened the recording medium's capabilities for capturing the dynamic range of the sounds. Electromechanical recording also captured a wider frequency spectrum than its predecessor, which meant that instrumentation required less tweaking as well.[202] Very early on, electromechanical recording could capture frequencies between 100 and 5,000 Hz, and by 1934 the device was able to capture frequencies up to 8,000 Hz.[203] This enhanced spectrum made the recorded music sound fuller, brighter, and more realistic, and consequently the sound of the recordings became more and more true to the sound of the performance as experienced in the concert hall. These improved

[199] Day, 2000: 9–12.
[200] See Day, 2000: 33, for a discussion of the ways in which recording engineers coped with the phonograph's inability to produce perfect fidelity to its sound sources.
[201] Millard, 2005: 141.
[202] Day, 2000: 16, 33.
[203] Day, 2000: 16–19.

capabilities (coupled with the still persistent background noise) came to characterize the material signature of the electromechanical recording medium.

It was the background noise of the phonograph that ultimately compelled American engineer Oberlin Smith to search for a recording method that was *not* mechanical (that is, dependent upon physical contact between stylus and cylinder). As mentioned in chapter 2, Smith identified this basic principle behind magnetic recording in 1878, but the magnetic tape recorder's entrance into music recording studios did not take place until 1947, and it only reached the mass market in the early 1950s. Despite Smith's original motivation, however, the reproductions generated via magnetic tape initially did not improve upon the sound quality of electromechanical recordings (though there were other advantages). The analog recording medium still left unwanted noise on the recordings, such as tape hiss and crackle. (It was not until 1966 that the British Decca studios introduced a noise reduction system that added ten decibels to the music, so that the background noise was less noticeable.)[204] In the early 1940s, its frequency response was 50 Hz to 10 kHz, and the dynamic range was 60dB;[205] by the end of the same decade, the frequency range had been increased to between 30 Hz to 15 kHz.[206]

In addition to the fact that the *recording* media of these eras caused signal interference, the *playback* media added extra noise to the already degraded sounds as well. Edison's wax cylinder, which was the standard recording *and* playback medium until 1910, the 78 rpm shellac disc, which was the dominant playback format between 1910 and about 1950, and the vinyl record, which was, together with the compact cassette, the dominant playback format throughout the second half of the twentieth century, were all constructed around the same principle: the grooves engraved in the phonogram (a recording process I described above) are converted back into sound signals by means of a stylus that vibrates while tracking the grooves during a steady-speed rotation. Since all of these playback media rely on physical contact between the audio information (the engraved grooves) and the encoder of this information (the stylus), they undergo wear and tear each time the stylus travels through the grooves, which gradually degrades the sound quality of the discs/cylinder. Moreover, the physical contact between stylus and disc generates frequency hiss (the sound level of

[204] Day, 2000: 21.
[205] Engel, 1999: 64.
[206] Gooch, 1999: 86.

which depends on the medium), and the grooves on the disc/cylinder surface also attract dust and dirt, which can produce popping and ticking sounds. The tape of the compact cassette, the mass production of which began in 1964,[207] also produced unavoidable noise in terms of "tape hiss"—that is, high-frequency random noise.

While the mechanical, electromechanical, and magnetic recording and playback media all colorize the recorded sounds significantly in terms of various forms of noise, as well as their respective limitations upon dynamic and frequency content, these sonic traces are eliminated by the digital recording and playback medium. This new technology achieved a dynamic range up to 98dB, a frequency range that included all of the frequencies audible to the human ear (20 Hz to 20 kHz), and, not least, complete operating silence.[208] Thomas Greenway Stockham, who developed the first commercial digital-audio recording system, has, according to Greg Milner, stated that what he regarded as the most "surprising" feature of digital audio "is that, except for the use of a finite number of digits to represent each sample, the reconstructed audio can in theory be made to be *exactly* the same as the original."[209] Since the sounds are converted into numbers, the digital recording medium adds no noise whatsoever to the sounds.

The digital *playback* medium, the compact disc (CD), which was introduced in 1982 but achieved commercial success only in the early 1990s,[210] also achieved total transparency or silence by relying on a laser optical decoder to read the binary codes from a disc surface made of polycarbonate plastic, in which the 0s are represented by pits and the 1s are smooth. The laser beam moves across the disc and the light is reflected back by the pits in different ways, which allows a light-sensitive photodiode to convert the codes into electric currents.[211] Since there is no physical contact between the coded disc and the decoder, this technology avoids the deterioration over time that is caused by the playback medium (as I will discuss in the next chapter, the

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[207] Morton, 2006: 161.
[208] The British label Decca Records claimed to have developed "full frequency range recording" (FFRR) already in 1945, but the audible frequency spectrum was in fact not entirely covered; the label's machines could only capture frequencies from 100 Hz to 14 kHz (Day, 2000: 19).
[209] Quoted in Milner, 2010: 222. He is not referring to the question of how trustworthy a music recording is to an original *performance*, but how trustworthy the recorded *sounds* are to how they were before they were recorded.
[210] Morton, 2006: 172–73.
[211] Millard, 2005: 350–51.

CD might, of course, nevertheless be damaged by other means), in contrast to previous playback media.

Jules Bloomenthal—a scientist working for Soundstream, which was the first commercial digital recording company in the United States—articulated one of the central aims in the development of each recording medium through history: "There shouldn't be a 'sound' to a board . . . It's like water or air. There shouldn't be a smell in pure air, there shouldn't be a taste to pure water, and there shouldn't be a sound to the mixing board. It ought to be totally transparent."[212] And, with the invention of digital recording and playback media, this mission was finally accomplished.

Past Medium Signatures Revisited

While many manufacturers, music makers, and consumers celebrated the digital's purported achievement of "perfect" fidelity of reproduced sound to sound source, others took a more nuanced view. Andre Millard explains:

> The almost clinical reproduction of the CD took some getting used to. Its range of frequency response matched that of the human ear, and it reproduced both highs and lows so exactly that it brought new meaning to many old recordings. It was uncommonly clean sound, so pure that it initially battered eardrums used to the comforting hiss of tape and the blurred, partly obscured highs of the vinyl disc.[213]

Albin J. Zak III points out that digitally recorded sounds were often criticized for sounding "harsh," "brittle," or "cold," noting that, in a sense, the digital's cleanness could be regarded as distortion of sorts in itself.[214] Such a sentiment informs the liner notes of the CD *The Rich Man's Eight Track Tape* (Homestead Records, 1987) by the alternative rock group Big Black (led by the now influential rock producer Steve Albini):

> This compact disc, compiled to exploit those of you gullible enough to own the bastardly first-generation digital home music system, contains all-analog masters. Compact discs are quite durable, this being their only advantage over real music media, you should take every opportunity to scratch them, fingerprint them and eat egg and bacon sandwiches off them. Don't worry about their

[212] Quoted in Milner, 2010: 229.
[213] Millard, 2005: 253.
[214] Zak, 2001: 113.

> longevity, as Philips will pronounce them obsolete when the next phase of the market-squeezing technology bonanza begins.[215]

The remastering of vinyl records into the digital format of the compact disc further stirred up the debate about analog versus digital, and, according to Greg Milner, some bands, such as the Rolling Stones, initially refused to remaster their music, claiming that "the grittiness of tape was integral to their sound."[216] Similarly, Neil Young once declared the LP format to be integral to his music and consequently dismissed its reissue on CD as a sort of forgery:

> My album *Everybody Knows This Is Nowhere* is now available on CD, but it's not as good as the original, which came out in 1969. Listening to a CD is like looking through a screen window . . . It's an insult to the brain and the heart and feelings to have to listen to this and think it's music.[217]

The reason why some musicians and producers in fact preferred the analog equipment was not that they experienced its sound quality as more trustworthy or transparent to the source, but the opposite—they favored it because of its characteristic signature, which they heard as an extra aesthetic dimension and "warmth" in the sound. Digital recording left the sounds completely exposed. Interestingly, it also occasioned a renewal of interest in how analog "clothed" those sounds, as an opportunity, this time, rather than a burden.

According to Jonathan Sterne (2003), Edison's tone test managed to convince listeners of the phonograph's fidelity to the source despite its significant noise because the technology was able to separate the internal sounds from the external, privileging the music over the background noise of the recording and playback media.[218] Despite its sonic limitations, which must have been clearly audible even to its contemporary consumers, the phonograph's new means of capturing sound seems to have overshadowed its drawbacks. Faith Stone (the first wife of Compton Mackenzie) evocatively describes her introduction to the electrical amplified phonograph in 1928:[219] "[I] found this new noise quite unbearable, though it was the

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[215] This CD is helpfully traced by Greg Milner (see Milner, 2010: 197).
[216] Milner, 2010: 209.
[217] Gracyk, 1996: 22.
[218] Sterne, 2003: 262.
[219] Sir Edward Montague Compton Mackenzie (1882–1972) was a famous English-born Scottish novelist.

latest thing and first-rate of its kind . . . Amplification spells vexation . . . but I soon got used to it, and even enjoyed it, which may or may not be a good thing."[220] Listeners soon learned not to focus on this specific sonic imprint of the medium but on the music that the medium represented; they more or less acquired what Rick Altman labels "selective deafness."[221] While listeners were used to listening *through* the medium signatures of musical equipment and recording technology, digital technology's elimination of sonic colorization demanded that they start listening *to* these sounds. In "Making Old Machines Speak: Images of Technology in Recent Music" (2000), Auner points out: "When technology is replaced the limitations come to the fore; the veil of transparency is lifted and we are forced to start listening to the accent as all the repressed characteristics of the old emerge with shocking clarity."[222] I have in previous chapters pointed out that opaque mediation over time might turn into transparency, but here is an example of the opposite: what was once taken to be almost transparent was suddenly noticed anew as quite opaque.

It was not only that the noise of pre-digital media became more "present" upon the arrival of digital silence, however—the meaning and function of the medium signatures of the pre-digital media changed as well. These things ultimately depend upon how we listen to the sounds in the first place; Andrew Goodwin illustrates this point by observing that some musicians in the 1970s regarded synthesizers as "cold," mechanical, and artificial, while post-digital musicians just a decade or two later described the same synthesizers as "warm" and authentic, or expressive of a "human feel."[223] Just as the new is always heard in light of the old, the old will always be revisited in light of the new.

As part of the countercultural reaction during the 1990s to the promotion of digital technology's "victory" over low fidelity, several musicians made recordings during this time that featured the sound of pre-digital recording and playback media, and pre-digital instruments and other music equipment. Moreover, sounds that previously had been regretted were now exaggerated. Amplified vinyl noise, for example, can be heard on Tricky's "Hell Is Around the Corner" (*Maxinquaye*, Island, 1995), DJ Shadow's "What Does Your Soul Look Like" (*Entroducing*, Mo Wax,

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[220] Quoted in Eisenberg, 2005: 91.
[221] Altman, 1992: 30.
[222] Auner, 2000.
[223] Goodwin, 1990: 265.

1996), Alanis Morissette's "Can't Not" (*Supposed Former Infatuation Junkie*, Maverick/Reprise, 1998), Massive Attack's "Teardrop" (*Mezzanine*, Virgin, 1998), Moby's "Rushing" (*Play*, V2 Records, 1999), and numerous tracks by Portishead, to whom I will return shortly.[224] This music represented a form of schizophonic experimentation, in the sense that the characteristic material signature of earlier media was split from its source and used as a compositional brick within a later technological context to produce an aesthetic effect. These aesthetic effects were, of course, dependent upon the listener associating these sounds with different media eras.[225] A lo-fi aesthetic had already characterized the garage rock of the 1960s, the punk rock of the late 1970s, and the hip-hop of the 1980s, but digital silence added an urgency to the movement that crossed genres and styles. And everyone could do it, as Andy Bennett points out: "The availability of cheap, high quality digital home-recording units has resulted in an increasing turn to lo-fi recording."[226]

Musicians and producers in the 1990s lo-fi movement could produce the sounds of pre-digital technologies and techniques "naturally" by using these technologies, or they could sample the old and noisy sounds from existing recordings, or they could reconstruct them anew. In 1998, *Future Music* published a two-part guide called "Go Lo-Fi! Back to the Future" in its February and March issues that described methods and equipment that would contribute to "gritting up" the sounds. *Future Music* journalist Matt Thomas starts the first part of the guide as follows: "Sick and tired of spacious reverbs and 24-bit delays? Bored of subtle compression and glossy mixing? Then come with us on a journey into sound. Monographic crap sound."[227] The ironic undertone of these introductory phrases is made obvious from the succeeding texts, in which Thomas makes clear that he prefer these "crappy" sounds, with phrases such as "that's the annoying thing about digital delays, they're too bloody good."[228] In the second part of the guide, written by Thomas and Dave Robinson, there are reviews of some of the new signal-processing effects that could recreate the sound of old

[224] For other examples of popular music featuring exaggerate vinyl noise, see Auner, 2000; Clarke, 2007; and Link, 2001.
[225] See Askerøi (forthcoming) for a thorough discussion of how musical sounds in pop productions might be heard as "sonic markers" with reference to already ascribed meanings from a particular context, and how these ascribed meanings might be the very reason for including these sounds in the music in the first place.
[226] Bennett, 2002: 98–99, fn. 2.
[227] Thomas, 1998: 78.
[228] Thomas, 1998: 78.

equipment: "For the first time in the history of recording there is equipment that intentionally makes your sound worse," they explain.[229] In addition to popular "retro-grot" sound effects (their term) such as Lovetone and Mutronics, they mentions the DAW plug-in BIAS SFX Machine, which, among its over two hundred built-in presets, offers simulations of bad speakers (such as telephones or car stereos), vinyl crackle, and radio tuning drift. They also single out Steinberg's Grungelizer plug-in, which makes the music sound like an old record by turning different knobs to control record crackle according to parameters such as age and rpm.[230] Already in the late 1990s, then, there were available, in Stan Link's words, "some very high-tech means to achieve 'lo-fi' ends."[231]

The 1990s reappropriation of pre-digital technologies and techniques brought with it all of the old analog sonic signatures, but people now heard them differently: what were once limitations were now desirable aesthetic qualities. More specifically, sounds that were once regarded as extramusical mediation (see chapter 1) were, after the digitalization of music technologies, reincorporated into the music's intramusical mediation—what's more, they were heard as such.

Vinyl noise and other sounds of pre-digital technology are now very common in contemporary popular music production, but as part of the music maker's sonic palette, not as a casualty of the available technology. Portishead, as mentioned, was among the 1990s bands that made use of this wide repertoire of sonic signatures from earlier times by sampling old sounds (and sometimes highlighting the medium signatures of those samples, such as their hum and crackle or limited frequency range), using pre-digital sound equipment, or exploiting the appropriate signal-processing effects to create similar sounds. What makes Portishead's music particularly interesting here is that, even as they plunder the analog past, they overtly embrace the digital present as well.

Portishead Going Retro

Portishead is Geoff Barrow (keys and programming), Adrian Utley (guitars and programming),[232] and Beth Gibbons (vocals); along with Massive Attack and Tricky,

[229] Thomas and Robinson, 1998: 80.
[230] Thomas and Robinson, 1998: 80–84.
[231] Link, 2001: 35.
[232] Adrian Utley first became an official member of Portishead shortly after they released their debut album, *Dummy*, but even here he played a significant role in composing, producing, and playing guitar on several tracks.

among others, they are often described as pioneers of the trip-hop movement that took place in the early 1990s.[233] Several of the artists since identified with this subgenre of electronica prefer the label "Bristol sound," since it was in this small town on the west coast of England that this particular musical style emerged. As trip-hop came into its own, rave culture was sweeping across Britain and hip-hop reigned in America. The "hop" of "trip-hop" might acknowledge the fact that the music often retains hip-hop inspired breakbeat rhythms, looped samples, and scratching. The "trip," on the other hand, might refer to the music's "trip" through diverse styles (techno, house, jazz, dub, reggae, and soul), or, more likely, to the "trip" associated with drug use, and especially marijuana—some claim that the mood and even the rhythms of trip-hop are explicitly designed to evoke the effects of this drug.[234]

Trip-hop can sound rather narcotic, with its mellow strings and use of the synthesizer pad (a sustained chord or tone with very long attack and decay time), gentle brush beat on the drums, and drifting basslines behind a passionate female torch singer. On the other hand, it can be loud and intense, with scratching turntables, bass-driven hip-hop beats, and thumping basslines accompanying a grunting rap vocal. Given all of this variety, the most characteristic aspect of trip-hop may in fact be the particular ways in which the music foregrounds its mediation, in terms of vinyl crackle and tape hiss, distorted sounds, bit-reduced, old samples, narrow-frequency sounds, old analog synthesizer use, and pre-digital sound-processing effects.[235] In other words, trip-hop's style derives directly from the ways in which its artists revisit, experiment with, and juxtapose the characteristic medium signatures of diverse musical eras.

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[233] Central to the trip-hop movement was the Wild Bunch, a Bristol DJ team formed in 1982 by Grant Marshall (Daddy G), Andrew Vowles (Mushroom), and Robert Del Naja (3D)—who later started their Massive Attack project—as well as Nellee Hooper, Miles Johnson, and Claude Williams. The record label Mo'Wax, founded by James Lavelle in 1992, also contributed to fostering this musical style (for more information on the trip-hop movement, see Johnson, 1996).

[234] Trip-hop artist DJ Shadow, for example, said this about his debut hit "In Flux" (*Camel Bobsled Race*, Mo Wax, 1998): "I don't take drugs . . . people told me the music took you somewhere that may be similar. It's the track I'd always wanted to do" (Pemberton, 1994). This is also how Tom Rowland from the British electronic duo the Chemical Brothers (then known as the Dust Brothers—not to be confused with the Los Angeles-based Dust Brothers) interprets DJ Shadow's music: "I really like DJ Shadow. It's a really weird way of approaching hip-hop. I like records that make you feel like you're on drugs but you're really not" (ibid.).

[235] See Brøvig-Andersen, 2007.

In interviews, the members of Portishead have voiced their obsession with the sounds of yesterday, and according to *Future Music* journalist Derek O'Sullivan, Adrian Utley "is renowned for his collection of classic guitar amps and effects boxes, incorporating everything from analog tape echoes and old Electro-Harmonix fuzz boxes to temperamental amps like the Ampeg Reverb Rocket and, his latest acquisition, a Leslie rotary speaker."[236] With the pronounced lo-fi attitude underpinning their stylistic mingling of hip-hop, acid house, ambient music, cool jazz, and melodious pop, Portishead's sound is often associated with "telephone voices," vinyl crackle, tape hiss, old samples, and old instruments such as the Theremin. Although the members of Portishead are obviously fascinated with the sound of old equipment, Utley acknowledges their debt to the digital medium: "None of us could say we hate digital because absolutely everything we do ends up in a sampler, which is digital."[237] To create their commercially successful 1994 debut album, *Dummy*,[238] the band members apparently used a sampler connected to a computer.[239] This was before audio recording had become a commercially available feature of computer-based sequencer programs, as discussed in chapter 2. Portishead, in fact, often recorded tracks first to analog tape and then sampled them from the tape in order to manipulate them.[240] They evidently used the computer-based sequencer program connected to the sampler to arrange and edit the sounds that would ultimately comprise *Dummy*.

"Strangers," which appears on this debut album, starts with a five-second sample from the introduction of "Elegant People" (*Black Market*, Columbia, 1976) by the jazz-fusion band Weather Report. The sample is easily recognizable despite the fact that it has been pitch-lowered and slowed down. Portishead has also added significant vinyl noise to the already existing medium distortion of the sample. After this short intro, a grainy drum loop starts up, together with a regularly accented and distorted alarm-beeping sound, additional vinyl noise, and an atmospheric, low-pitched drone. The heavily compressed and throbbing drum loop sounds as if it too

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[236] O'Sullivan, 1998: 76.
[237] Curwen, 1999: 74.
[238] *Dummy* reached a wide range of listeners in the United States as well as in Britain and the rest of Europe, and the following year they received the prestigious Mercury Music Prize for the album (see news.bbc.co.uk/2/shared/spl/hi/guides/456900/456975/html/nn1page5.stm [05.20.12]).
[239] O'Sullivan, 1998: 76.
[240] Curwen, 1999: 75.

has been pitch-lowered and slowed down. After twenty-eight seconds, this crackling, grungy atmosphere of vinyl noise and distorted sounds is suddenly replaced entirely by a clean, reverb-drenched acoustic guitar accompanying Beth Gibbons's melodious vocals by playing a minimalistic samba riff. In the background, we also hear some extramusical sounds at this point, as if there is someone in the room with the band, which associates the music with a typical live music session. Thanks to the acoustic guitar and the intense, expressive vocal performance, we might start to imagine a performance in the vein of the singer-songwriter tradition, but not wholeheartedly: Portishead has filtered out the high and low frequencies of the voice here, producing a sound that belongs to early recording and playback equipment, a transistor radio, or an old telephone (think of the familiar "telephone filter"). After a verse, there are two seconds of digital silence behind a solo synthesizer that supplies three pulsating and distinct tones (1:12–1:14, min:sec), then the distorted drum-and-alarm groove takes over to accompany the vocal. Portishead removes the vocal filter at this point, so the play between clean and "dirty" sounds persists, but it has now been revised. Soon, the drum-and-alarm groove is suddenly interrupted again, this time by what sounds like a sample of an old orchestra recording—its sonic characteristics stick out markedly from the rest of the music (2:00–2:12). The distorted drum-and-alarm groove takes over again but soon gives way to a one-second signal dropout that results in total digital silence (2:21–2:22). Then the groove resumes as an accompaniment to the vocal, drops out for a moment (leaving the vocal in complete digital silence with only a reverb tail and a few distant springlike sounds), and reappears again until the track abruptly stops.

The Weather Report sample that introduces "Strangers" is from 1976 but sounds as if it belongs to an earlier era, thanks to its limited frequency range and high level of background noise; it was likely manipulated by Weather Report and then again by Portishead in order to achieve this effect. Portishead's interest in sampling from old records is evident in several of their tracks: "Western Eyes" (*Portishead*, 1997) contains a 1957 sample from the Sean Atkins Experience's "Hookers and Gin"; "Sour Times" contains a 1954 sample from Lalo Schifrin's "The Danube Incident"; "Biscuit" contains a 1959 sample from Johnnie Ray's "I'll Never Fall in Love Again"; and "Glory Box" contains a 1971 sample from Isaac Hayes's "Ike's Rap II" (all from *Dummy*, 1994). While the practice of sampling often represents a historically and culturally conditioned engagement with one's musical roots or an act

of homage to earlier artists, Portishead also appears to sample out of their fascination with the characteristic *sound* of a particular era.[241]

As mentioned, the sequence between 2:00 and 2:10 in "Strangers" sounds like a sample from an old vinyl record of classical orchestra music. However, the only sample specified in the liner notes is "Elegant People," so this orchestral interlude is probably not preexisting music at all but a new composition replete with a reconstructed medium signature of a long-ago era. In this case, then, the members of Portishead have sampled themselves, in a sense, in the guise of something else.[242] They have stated that they have also sampled the vinyl crackle from an actual old record and applied it atop their own recording, and they have used processing effects or lo-fi recording gear to make their performances appear gritty and old.[243] Elsewhere, for example, Portishead indicates that the string orchestra on the track "Humming" (*Portishead*, 1997) was recorded in the London-based AIR Studios (Associated Independent Recording Studios, founded by George Martin and John Burgess in 1965), then transmitted to compact cassette in order to degrade the sound signal, and finally sampled from there and reinserted into the music.[244] Guitarist Adrian Utley adds: "Me and Geoff [Barrow], in the studio, will have an idea for the end kind of result and the whole basis of what we do is making it sound like old breaks, old records or whatever it is."[245]

The drums in "Strangers" also sound as if they are sampled, not only because they are looped but also because the sound quality is clearly pre-digital. According to the liner notes, however, they are not sampled; session player Clive Deamer (who has collaborated with Portishead on several tracks) played the drums for the track. Utley clarifies the band's approach here:

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[241] Tricia Rose makes this point in terms of hip-hop as well: "The quality of sound found in these 1960s and 1970s soul and funk records are as important to hip-hop's sound as the machines that deconstruct and reformulate them" (Rose, 1994: 78).

[242] Joseph Schloss quotes hip-hop producer Domino, who also samples his own music in order to create a medium signature from the past: "I think there's a lot of people out there playing stuff that doesn't sound . . . like the sounds are either—to me—too new, or just sound real generic, you know? So the stuff that I did that's live, I kinda want it to sound like it's a sample, in a sense" (Schloss, 2004: 71).

[243] In several interviews, Portishead describes their use of diverse techniques to make sounds appear to be old samples. See, for example, O'Sullivan, 1998: 77, and Curwen, 1999: 75.

[244] Curwen, 1999: 75.

[245] Curwen, 1999: 75.

> We'll get Clive in to do a drum session for a day and make loads of different loops, and then it's down to Geoff and me coming up with ideas and Dave [McDonald] will be there to record things. We'll be looking for a couple of loops to make a song up. We're very anal about how we make those sounds—we'll get a loop and we'll work on whether you hear something on it ringing over from the previous bar (the one that wasn't sampled), like the tail of something played before, which adds a different sound to the loop.[246]

Instead of asking a drummer to accompany a particular track, they ask for a range of different beats, which they then sample and insert in different tracks, undermining any sense of their actual "liveness." In addition to revealing a heavy vinyl crackle, the sound quality of the drum loop in "Strangers" is just generally poor, as if they reduced the sample bit standard of digital recording from 24-bit to 12-bit or even 8-bit in order to degrade the sound quality.[247] As mentioned, it also sounds as if the drums are pitch-lowered and slowed down, both of which suggest the analog medium as well: when a sample is given a slower tempo using an analog medium, its pitch also automatically changes; in the digital medium, on the other hand, these two parameters can be treated independently. The tempo reduction results in an extended duration for each attack and decay of the drum sounds, and the pitch lowering, of course, increases the activity in the lower frequencies and reinforces the dirty or gritty character of the drums.

While Portishead's affection for pre-digital sound equipment and the sonic signatures of previous media might appear nostalgic, the band also obviously values the digital medium, because they highlight its characteristics right alongside their (also digital!) play with the analog. Even as the pre-digital sounds imply the music's alignment with another era, the moments of digital silence (1:12–1:14 and 2:21–2:22) reveal where the music *actually* sits in time, placing us firmly in the present even as the music speaks to (and in the voice of) the past.[248] The complete digital silence

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[246] Curwen, 1999: 75.

[247] Note that 24-bit depth represents 16,777,216 intervals of measurement of sample voltage, while 12-bit depth represents just 4,096 intervals, and 8-bit represents just 256 intervals. See chapter 2 for an explanation of how the digital conversion of sound works.

[248] Portishead's juxtaposition of a previous medium's signature with a clear acknowledgment of the present medium complies with a form of remediation described by Bolter and Grusin in which the digital medium exposes a previous medium in addition to itself and thus highlights the differences therein (Bolter and Grusin, 2000: 44–50). Bolter and Grusin contrast this practice with another form of remediation, in which an older medium is remediated in digital form in such a way that it leaves the digital medium more or less transparent (ibid.). This latter form of remediation complies with the nostalgic strategies in popular music that

between the three synthesizer tones in the section between 1:12 and 1:14 is represented in the spectrogram depicted below (see figure 4).[249]

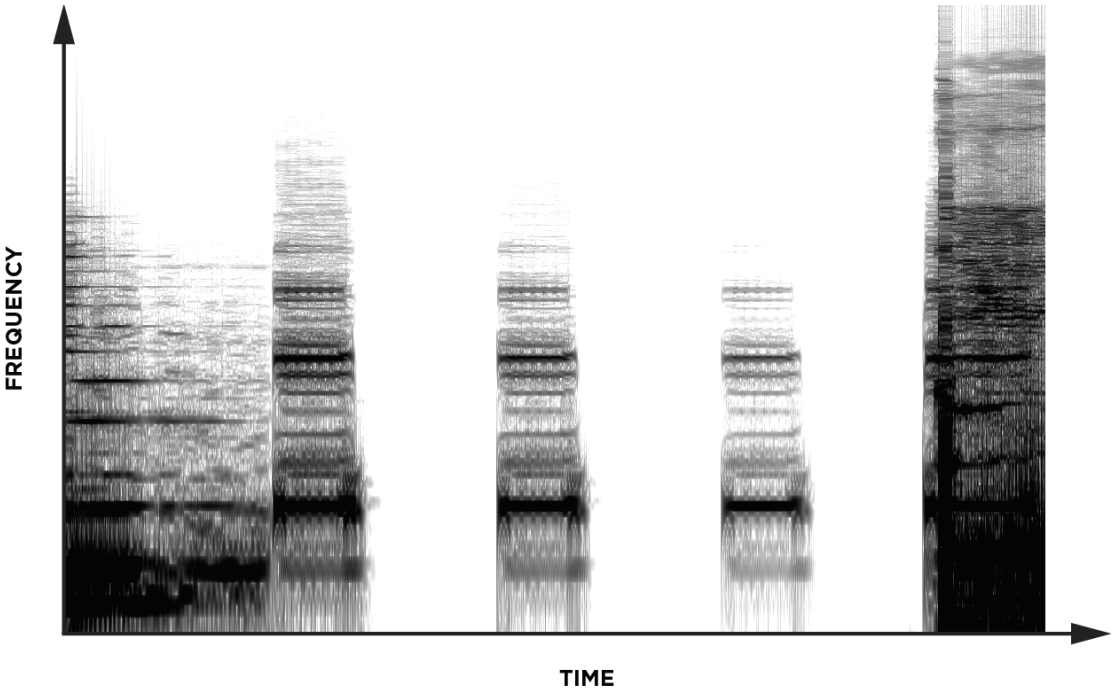

Figure 4: The periods of digital silence between 1:12 and 1:14 in this spectrogram are indicated by the complete lack of color representing frequency response.

The frequency-filter changes applied to the voice in "Strangers" also signify that the music shifts between medium eras, and, similarly, the crackling, gritty drum-and-alarm sequence seems to belong to a different era from the clean acoustic guitar. Most importantly, we are made to understand all of these juxtapositions as conscious aesthetic choices rather than unavoidable technical limitations, based upon the music's complementary assertion of the digital as well as Portishead's back catalogue; tracks such as "Undenied," "Cowboys," "Elysium," "Seven Months," and "Humming" all exhibit a similar mingling of signature and style. O'Sullivan sees this juxtaposition as a fundamental characteristic of Portishead's music: "Grainy, shuffling drum grooves, pulsing compressed bass, moody drops and scratches and

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foreground both the qualities and the limitations of technology from the past while dismissing today's technology altogether—that is, using vinyl noise and old sound equipment *throughout* the production, rather than in contrasting passages, to evoke another era altogether.

[249] The program I used to depict the spectrogram (also referred to as a sonogram) is Amadeus Pro. I am grateful to Hans T. Zeiner-Henriksen for helping me to interpret this spectrogram.

brooding aural peripherals, all sitting under a production hallmark that manages to instill classic 'oldness' with the clarity and polish that's become essential for contemporary, and—let's not deny it—radio friendly music."[250] Portishead's music ultimately evokes Fredric Jameson's description of the postmodern pastiche as an "imitation of dead styles" or a "cannibalization of all the styles of the past."[251] Yet, by putting their vinyl noise within a digital frame, the band members do not position themselves outside history but solidly within the present. When Portishead mixes and contrasts new and old technology in a single track, we hear both media anew, an effect that would be lost if one of the media were to last from beginning to end.[252]

The dual foregrounding of pre-digital media signatures in a digital frame invites us to look at today's technology as a medium with its own voice. This last point returns us to Louis Marin, who concluded the same sort of thing in relation to the dark background of a painting, which he described as a non-representational self-representation:

> What does this dark background represent? Nothing. "Nothing" names something which cannot be named. But if this background does not represent anything, it presents itself as nothing: it presents itself as not representing something. And it is this pure self-presentation that allows the whole painting to represent the three objects with such force.[253]

Just as this "nothing" is in fact a form of self-representation, so is the completely silenced background of the digital format. Digital silence need not be understood only as "nothing"—as the erasure of medium materiality—but as a signature of its own, and one that is in fact worth "listening" to.

Auner notices something similar about Portishead's "Undenied" (*Portishead*, 1997): "The opposition of the sound of a very scratchy record and digital silence

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[250] O'Sullivan, 1998: 76.
[251] Jameson, 1984: 65–66.
[252] Although "Strangers" does not have a music video, it is perfectly possible to reflect a commitment to new technology alongside a fetishization of the old in film, as Quentin Tarantino's thriller *Death Proof* (2007) demonstrates. Throughout this film, signatures of old technologies include black-and-white images, images with poor color quality and low resolution, jump cuts, and other medium "flaws" that the digital film medium has made obsolete. Yet *Death Proof* insists upon its contemporaneity regardless—for example, in one of its black-and-white shots, a woman pulls a mobile phone from her pocket. Like "Strangers," *Death Proof* reveals itself to be grounded in the present while drawing on (and subsumed in) the past.
[253] Marin, 1991: 66.

become an integral part of the composition."[254] Moreover, he points out that while the digital is often described as "cold" and contrasted to the "warmness" and "emotionality" of the analog, "Undenied" reverses these stereotypes. By contrasting the here dominant sound of old technology with just a few bars of utter digital silence, it is the latter that delivers an extra emotional punch:

> Here when the scratchy noises and cymbal hiss drop out we are confronted with a desperate emptiness. Through the lyrics the vinyl noise becomes the embodiment of the obsession; the thought of absence results in the moment of absolute emptiness represented by the digital silence, now made horrible and empty.[255]

The digital void of sound and noise, then, might function as a metaphor for emotional emptiness. During the moments of signal dropout in "Strangers," the background of "nothing"—the void of sound and noise—is suddenly foregrounded and presented as a musical feature that provides aesthetic and emotional pleasure in the same way as older technologies. Portishead, then, brings new meaning to both the out-of-date *and* the up-to-date.

Portishead might thus be described as a "retro" band, following the definition of art historian Elisabeth Guffey, the author of *Retro: The Culture of Revival* (2006):

> "Retro" suggests a fundamental shift in the popular relationship with the past . . . Half-ironic, half-longing, "retro" considers the recent past with an unsentimental nostalgia. It is unconcerned with the sanctity of tradition or reinforcing social values; indeed, it often insinuates a form of subversion while side-stepping historical accuracy.[256]

While lo-fi sounds appealed to Portishead and other musicians of the 1990s popular music scene for the reasons mentioned above (the atmospherics caused by the colorization of old equipment, and the various musical possibilities of lo-fi in tandem with or contrast to the digital), this interest in sounds from the past also dovetails with the larger subcultural "retro movement," which reaches from clothes to furniture, cars, social pastimes, and so on. This sweeping cultural means of revisiting the past

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[254] Auner, 2000.
[255] Auner, 2000.
[256] Guffey, 2006: 10–11.

seems to express an ambiguity about the contemporary, in which neither the new nor the old is valued in their pure or unmitigated form. Instead, the new is pushed forward through the reinvention of the past from the position of the present. In this way, as suggested by the title of the "Go Lo-Fi" guide (*Future Music*), it represents a path "Back to the Future."

Conclusion

The total silence that is one of the most characteristic signatures of digital mediation brought about a consequent revalidation of the transcended medium signatures of analog noise. Brian Eno points out that the characteristic "limitations" (his word) of a medium communicate "something about the context of the work, where it sits in time."[257] But these limitations, as we have seen, can be constructed as well as inherent, and desired as well as regretted. What they say, in short, is what we make of them. Still, a track's sound, however it comes about, at minimum signifies an era and starts a process of schizophonic negotiation with the listener based upon expectations, previous experience, and cultural associations. While we once tried to listen *through* the different kinds of noise that were characteristic of a given medium, we now listen *to* them, thanks to the revalidation of medium signatures in the age of their potential absence. The meaning and function of a medium's sonic signature are discursively dependent; we hear it differently when we use it differently (when we can take it or leave it). John Cage's description of noise rings true with regard to the signatures of pre-digital recording media and music equipment: "When we ignore it, it disturbs us. When we listen to it, we find it fascinating."[258]

Of course, this also applies to the digital signature of silence. The members of Portishead expose not only old technology but also the medium of their own time, and in this way invest the latter with *new* meaning. In the end, they question the assumption that the sonic signatures of previous media possess inherent aesthetic and emotional qualities that the digital medium does not, and they lay bare our self-interest in deciding this one way or the other.

[257] Eno, 1999.
[258] Cage, 1967: 3.

Chapter 5

Cut-Ups and Glitches:

DJ Food's Freeze and Flow

The ability to cut and paste recorded material with scissors accompanied the development of magnetic tape, as I discussed initially in chapter 2.[259] While some musicians and engineers stuck with a more conservative approach, rejecting the medium's newfound ability to splice tape, others welcomed the possibility but used it in a discreet or entirely hidden fashion, to eliminate unwanted sounds or move a sequence from one take to another in order to make things sound better. Still others, however, such as participants in the early-1950s electroacoustic music scene, as well as the literary experimentalist William S. Burroughs,[260] took a more experimental approach to cutting and pasting, fragmenting spatiotemporal structure until the recording/production medium itself became opaque rather than transparent to the listener. These early cutting and pasting techniques were soon adapted to the field of popular music and culminated with digital sequencer programs. Embraced by the popular music industry in the second half of the 1990s, these sequencers renewed and reinvigorated the experimental cut-and-paste approach through their vastly more efficient virtual cut-and-paste tool, which eliminated the extremely time-consuming process of physically splicing tapes.

This chapter features an analysis of "Break" (*Kaleidoscope*, Ninja Tune 2000), by the collaborative electronica team called DJ Food, in which the experimentation with and foregrounding of cut-and-paste plays a significant part. The title of the track refers to the initial scattering of balls at the beginning of a game of pool, which becomes obvious from its lyrics as well as its background sounds of colliding billiard balls. Yet the title, "Break," has other associations as well. It might allude to the sonic

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[259] Parts of this chapter appear in, or are revised from, Ragnhild Brøvig-Hanssen (2010): "Opaque Mediation. The Cut-and-Paste Groove in DJ Food's 'Break,'" in *Musical Rhythm in the Age of Digital Reproduction*, ed. Anne Danielsen, pp. 159–75 (Farnham, Surrey: Ashgate).

[260] In addition to his literary cutting and pasting (he spliced together pieces of his own writings), Burroughs also experimented with *sonic* cut-up poetry, splicing tape bits from a magnetic tape recorder (see Burroughs, 2009, first published in 1962, and Lydenberg, 1994).

breaks—that is, the signal dropouts—that appear between the track's sound fragments. It might also refer to the way in which these signal dropouts break the flow of the music as they play their part in what I will call its "freeze-and-flow" groove. It might refer to the *broken* playback medium with which the skipping and stuttering sounds might be associated. It might even acknowledge the break (as in crack) in the recording/production medium's purportedly realistic and transparent narrative or representation of a traditional, spatiotemporally coherent performance. Finally, "Break" might assert DJ Food's dismissal of the illusion that the digital medium is perfect, or almost so. These many associations, in turn, sum up the issues that will be discussed in this chapter.

I will start by analyzing the music in terms of its exploitation of the cut-and-paste tool, in the interests of demonstrating that the foregrounding of mediating technology is a big part of the music's overall musical design. I will also elaborate upon both the roots and the novelty of the cut-up techniques used here. Then I will examine the associations between those techniques and glitches or malfunctions in digital technologies, and the history of aestheticizing those effects in popular music. Finally, I will discuss how the cut-up sounds involved in "Break" might be understood to be unmusical *and* musical at the same time, and how the ability of the recording/production medium to transparently represent a coherent performance might be both confirmed *and* denied.

Cut-Ups and Signal Dropouts in "Break"

DJ Food initially consisted of the English electronica duo of Matt Black and Jonathan More, but over the years it became a loose collaborative team with rotating members. For DJ Food's eighth album, *Kaleidoscope*, which features "Break," the people responsible were PC (Patrick Carpenter) and Stricktly Kev (Kevin Foakes),[261] because Matt Black and Jonathan More had left to concentrate on their other music project, Coldcut. The concept behind DJ Food's first albums was to feed other DJs with musical "food" (hence the name) in the sense of loops and samples that they could use when producing or remixing their own music. They released five CDs of jazz breaks on their own independent record label, Ninja Tune, between 1990 and 1994, before

[261] Over the past few years, DJ Food has become a solo project of Stricktly Kev, who also produces mash-up music, which will be discussed in the next chapter of this thesis.

they changed direction and began to favor independent remixes in a grey area between the genres of electronica, hip-hop, and jazz.

"Break" is a cut-and-paste montage of sound fragments and sequences in which the vocal signal constantly drops out at regular intervals. The use of the cut-and-paste tool in "Break" produces a distinctive staccato effect and "partitioned" groove that manages to sound both disjointed and coherent at the same time. The music here include a talking/rapping vocal, a simple drumbeat, a piano riff comprised of jazz chords, and some atmospheric sounds. The voice is sampled from Lightnin' Rod's "The Break Was So Loud, It Hushed the Crowd" (*Hustler's Convention*, United Artists, 1973) and is mingled with the background sounds of billiard balls in action.[262] Though it is manipulated to a significant extent, Lightnin' Rod's vocal performance is easy to recognize. In the original track, Lightnin' Rod performs his lyrics rhythmically but varies the tempo of the delivery. In "Break," the sample is all chopped up, and the sound pieces are separated by signal dropouts, which slow the performance and overlay a more staccato rhythm upon it. This rhythmic quality evokes the "electric boogie," in which dancers freeze and then flow in succession.

The notation below (see figure 5) represents the vocal rhythm in the first four bars; here, the rests indicate not traditional pauses but signal dropouts.

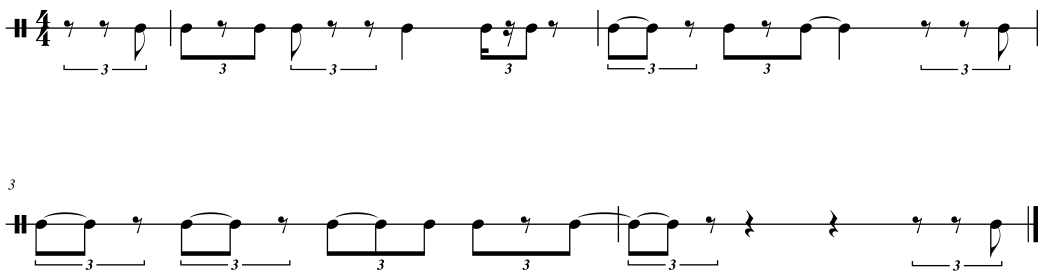

Figure 5: The vocal rhythm in the first four bars of "Break"; the rests represent dropouts.

[262] Lightnin' Rod (Jalaluddin Mansur Nuriddin/Alafia Pudim) is a former member of the Last Poets, who were pioneers of rap in hip-hop music. In *Hustler's Convention*, Lightnin' Rod performs his poetry to the music of the influential American funk and rhythm and blues group Kool and the Gang.

The notational representation above might seem unwieldy because of its many rests; in transcriptions of popular music, there is a tendency to replace smaller rest units with larger note units to improve readability. However, this often gives the wrong impression, because the rests and dropouts are every bit as important as the sounded notes. As Anne Danielsen points out in *Presence and Pleasure: The Funk Grooves of James Brown and Parliament* (2006), where a sound *ends* is as important as where it begins: "The gaps between the sounds create the groove as much as the sounds themselves do."[263] Danielsen also quotes John Miller Chernoff from *African Rhythm and African Sensibility* (1979): "The music is perhaps best considered as an arrangement of gaps where one may add rhythm, rather than as a dense pattern of sound."[264] Danielsen and Chernoff are referring to traditional rests, but signal dropouts contribute to the rhythm with as much energy and force as either the sounds themselves or the traditional rests. The signal dropouts in "Break" never fall on the four main beats within the music's measures, though they do correspond to a strict metronomic reference grid that in turn maintains the groove despite the silences. As listeners grow accustomed to the constant alternation between dropouts and sound fragments, the music begins to activate our musical expectations in this regard, and we come to expect sound to succeed silence, and vice versa. These expectations contribute to the persistence of a perceived forward movement in this otherwise halting groove; in fact, its apparent "lack of flow" constitutes a particular flow in and of itself—that is, the freeze and flow.

In order to illustrate and support my auditory analysis of how the cut-and-paste tool is used on the vocal sample, I have reconstructed the track in the DAW program Logic Pro 7, as displayed in figure 6. By comparing amplitude graphs of the original vocal performance and its sampling in "Break," I can tell where the track is chopped up, which sequences are copied, and how they have been pasted back together. The upper track in figure 6 represents the first seven bars of "Break" following the introduction. The lower track shows the original sequence of the sampled voice. The middle track depicts my reconstruction of how the vocal sample (the lower track) has been manipulated by the cut-and-paste tool in "Break" (the upper track).

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[263] Danielsen, 2006: 54.
[264] Chernoff, 1979: 113–14.

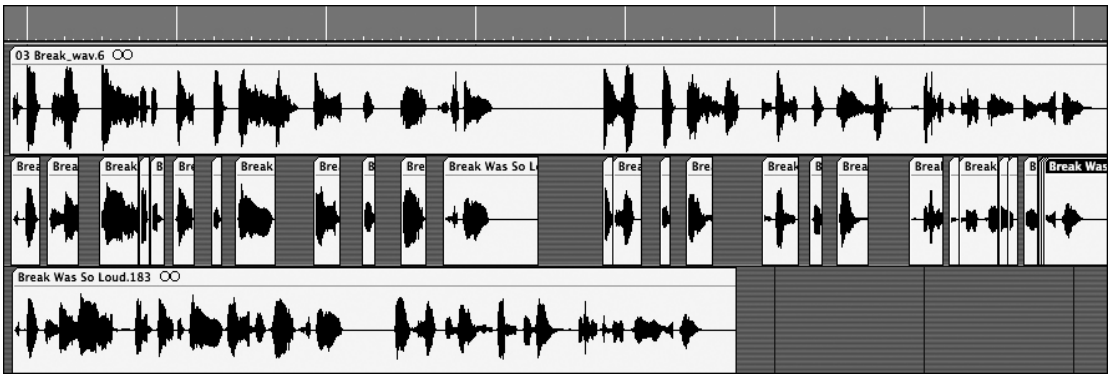

Figure 6: Sound sequences displaying the amplitude graphs of (1) "Break" by DJ Food, (2) a reconstruction of the manipulation of the vocal sample in "Break," and (3) the vocal sample in its original form (as it appears in Lightnin' Rod's "The Break Was So Loud, It Hushed the Crowd").

Though the vocal sequence is in fact the same in each of the tracks displayed in figure 6, the "Break" amplitude graph also accommodates the drum track. In addition, the sample is compressed furthest here, and the voice's pitch is lowered, which results in a time dilation. Nevertheless, the original sample remains recognizable.

The first verse of "Break" consists of eight measures in which the voice is accompanied by drums only. The drum pattern is simple and follows the vocal rhythm. The words are delivered as follows:

> The break– was so– loud<>that– it– hushed– the– crowd–
>
> ~~Th~~ey all– grew– **q**uiet– and still . . .[265]

The dashes mark places where the sample is cut and separated by a signal dropout. The sample is also cut between the pronunciations of the words "loud" and "that," but in this instance the fragments are joined together rather than broken apart. It is important to note here that an unmanipulated sound consists of an "attack" (the sound's onset), a "decay" (the transition from the attack to the sustain), a "sustain"/"steady state" (the middle section of a sound), and a "release" (the sound's

[265] The text is not printed in the liner notes or on the band's website (www.djfood.org), so I have transcribed it myself.

offset or fadeout). The sound's attack specifically consists of amplitudes that rise from zero to a given peak. In the second sentence here, the complete attack on the pronunciation of the word "they" is cut off, so it sounds like "ey." On the word "quiet," only the amplitudes before the peak of the attack are cut off. Thus, since the rising amplitudes of the attack are missing, the peak appears abruptly, resulting in a sharp, "edgy" consonant that demonstrates the potential impact of the cut-and-paste tool upon sound as well as rhythm. The natural resonance following the decay of a sound is often removed in "Break" as well—"still" is the only word in these two sentences that dies out normally, with a comparatively distinct and lengthy resonance.

The next two sentences in the first verse are as follows:

~~I h~~ad<>sunk– the– one– and thus– be–gun–

The test– ~~of~~ m–my– poo-o-o–~~lro~~om-m-m-m-m skill

The first word and the beginning of the next ("I had") have been cut off (indicated here by a strikethrough). The pronunciation of the word "begun" is chopped in two and separated by a signal dropout. In the next line, "of" is also cut off and replaced by the "m" from the following word, creating a stuttering effect: "m–my." Likewise, in "poolroom," the "o" and the "m" are chopped up, then copied and pasted consecutively. The word has also been split and the letters "lr" cut out of it. The dropouts in this first verse, of course, differ from traditional musical rests in that they are generally complete digital silence, without any form of atmospheric noise or "dead air" (with the exception of the three places where the drums are playing as well).[266] This contributes to the impression that parts of the sound signal are somehow missing altogether.

After this verse of eight bars, there is an interlude of sixteen bars consisting of drums and piano that perpetuates the staccato vocal rhythm but without dropouts. Whereas dropouts silence their sounds very abruptly ("too soon," in effect), traditional rests allow sounds to die out first. In this interlude, then, the sounds of the

[266] While dropouts often consist of digital silence, this is not a *defining* feature; one can also cut an analog tape and insert a blank sequence of tape within it, and those sequences always leave some hum and crackle behind. Moreover, other instruments can sound during a dropout.

piano and drums do not end abruptly but resonate (this is particularly obvious with the piano). Yet the rhythm of the interlude reveals a similar freeze-and-flow style to the rhythm of the verses, and it is likely that the arrangement here is inspired by the stuttering sonic effects of the cut-and-paste tool.

In the second verse, the piano joins the accompaniment of the voice, and the drums become more active. Unlike the first verse, the drums and the piano now often sound during the signal dropout of the voice track, either as played notes or as a decaying resonance. The first two sentences in the second verse are performed as follows:

> I put– in-n-n-n-n– ~~this~~ on– ~~the~~– cue–, then– d-d-d-dropped– the– two–
>
> ~~T~~o<>sank – the– three– and the f-f-f-f-four

Here are several more instances of words whose attacks or decays are partly cut off, words that are left out, and natural spaces that are shortened or erased. As in the first verse, the sentences here are chopped up into a staccato rhythm featuring signal dropouts between several of the sound fragments. The technique of cutting the vocal sample up into these very short fragments, then pasting them together into identical repeating cells, also occurs frequently here: the "n" in the word "in," the "d" in "dropped," and the "f" in "four" are all isolated and repeated consecutively. Here, then, the cut-and-paste tool is applied on a microrhythmic level. Contrary to "m–my" in the first verse, where the repeating "m" results in a stuttering effect, the intervals between the cells have become much shorter and more numerous, so that the cells themselves become percussive elements, comparable to programmed and quantized drum rolls. The "f" in the word "four" is pasted consecutively with such short intervals between soundings that the cut-and-paste tool starts to produce sounds itself, in form of clicks (a characteristic feature of much electronica music).

While the experimentation with cut-up techniques continues throughout the track, I will conclude my description of it by discussing the two last sentences in the second verse:

Conti~~nued~~– my– drive– by bagg–ing the– five–

Was– "spoon"–, kep~~t~~– ~~tr~~ack– of– the– sc–ore[267]

Here signal dropouts split the words "bagging" and "score," and several other sounds have been cut off as well. When I transcribed this text from "Break" before I heard the original version, I interpreted the two last sentences in the second verse as "*they took* my drive / by bagging the five / was 'spoon,' *get back to* the score." Certainly the cutting between or within words can obscure texts while likewise suggesting new words and new meanings, possibly to confuse listeners or otherwise activate their interpretive skills or situational awareness. Whatever the intent, it is apparent that the sound and rhythm of the voice carry at least as much weight as the semantic meaning of the text. The parameter of lyrics is here eclipsed by the parameter of technological mediation.[268]

As we have seen from this analysis of "Break," exposed cut-up techniques can engender a wide variety of different musical effects, depending on how they are used. In several of the musical phrases mentioned above, for example, some of the attacks and decays of the sounds are cut off. This artful disruption of the acoustic qualities of sounds was also practiced by American composer John Cage and French pioneer of *musique concrète* Pierre Schaeffer, among others. In 1951, Cage organized the Project of Music for Magnetic Tape,[269] whose aim was to explore tape as a medium for creating music in and of itself, and in 1952 he and other project participants composed

[267] "Spoon" is my best approximation of the sound of the word here, which I cannot otherwise make out.

[268] In several of the musical productions where cut-ups are particularly exposed, their music videos reinforce these effects (this is the case with Madonna's "Don't Tell Me" video, for example, which is discussed in Danielsen and Maasø, 2009) and make the opaqueness of the mediation even more profound. Although there is no official music video of DJ Food's "Break," a prominent example of how film might support cut-up music is the electronica duo Telefon Tel Aviv's "What It Is Without the Hand That Wields It" (*Map of What Is Effortless*, Hefty 2004). The stuttering effect caused by the cut-and-paste tool is here synchronized with the editing of film in the video. In other instances, the music video creates "video music" in the sense that the music is created by the very juxtaposition of audiovisual clips, which brings to mind the music videos of the London trio Eclectic Method. The introduction of their video "We Are Not VJs" is a montage of short clips from different musical sources, pasted consecutively, and in their "Kill Bill Remix," shots from selected fighting scenes from the Quentin Tarantino film *Kill Bill* are cut out and placed so that the punches and kicks correspond to a strict metronomic grid and therefore construct a drumbeat.

[269] Other participants in the project were Earle Brown, Morton Feldman, Christian Wolff, and David Tudor (Holmes, 2002: 114).

Williams Mix,[270] a juxtaposition of hundreds of spliced tapes. Cage announced upon the occasion, "The chief technical contribution of my work with tape is in the method of splicing, that is, of cutting the material in a way that affects the attack and decay of sounds recorded."[271] Schaeffer also liked to remove the attack and decay of sounds in order to facilitate "reduced listening," which he saw as the act of listening to sound for its own sake. Already famous for manipulating sounds by, for example, altering the speed of a phonograph's turntable, Schaeffer started experimenting with tape in the late 1940s and soon discovered that if one physically cut off part of a sound's attack, it became much less recognizable, which furthered his aim of blotting out the listener's associations with a sound's source.[272]

This is not the only cut-up technique that has roots in the mid-twentieth century; signal dropouts also hark back to this unsettled creative era. In 1952, the young German composer Karlheinz Stockhausen regularly visited Schaeffer's Groupe de Recherces Musicale (GRM) studio in Paris for instruction in the art of tape editing,[273] and he later described numerous experiments involving the insertion of leader tape between sounds to create percussive, stuttering effects.[274] The difference between then and now, however, is that while signal dropouts in an analog medium are created by *inserting* leader tape—that is, blank, nonmagnetic tape normally used at the beginning and ending of a track—digital signal dropouts are created by simply *removing* the signal itself, which automatically leaves the sequence with digital silence (or, alternatively, with the sounds from other ongoing tracks).

While some of the stuttering effects in "Break" are created by dividing sound sequences using signal dropouts, others are created by repeating sounds, as we saw above. Schaeffer produced a similar repeating effect by using a disc cutter to lock grooves in the phonographic disc to repeat the sounds therein,[275] but magnetic tape made this operation much more straightforward, thanks to the new option of tape loops—that is, cut-up sound sequences in which both ends are pasted together and then placed on a tape recorder for playback. Producer George Martin described the

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[270] *Williams Mix* was created by John Cage, Earle Brown, and David Tudor, with the technical and creative assistance of Louis and Bebe Barron (Holmes, 2002: 115).
[271] Quoted in Holmes, 2002: 116–17.
[272] Taylor, 2001: 46.
[273] Groupe de Recherces Musicale was the first established major electronic music studio (Holmes, 2002: 86).
[274] Holmes, 2002: 135.
[275] Holmes, 2002: 92.

process of recording the numerous loops in the Beatles' "Tomorrow Never Knows" (*Revolver*, 1966): "All over the studio we had people spooling them [the loops] onto machines with pencils while Geoff [Emerick, the engineer] did the balancing."[276] Obviously, the digital recording/production medium made all of this work easier still. Though we still tend to describe repeated sounds as "loops," digitally repeated sounds (or, more precisely, the digital information that generates these sounds) are simply copied with a mouse click rather than physically looped.

Few of the sonic effects caused by the cut-and-paste tool in "Break" are new with the digital medium, but they are nevertheless much more common there. For example, it took Cage a *year* to produce the cut-up tape collage *Williams Mix*,[277] while it certainly took a lot less time to produce DJ Food's "Break," a work that would simply overwhelm any sort of physical cut-and-paste operation in the analog medium. The fact that "undo" operations were not even an option with pre-digital recording equipment made experimentation with these sorts of processes even more time-consuming. Digital sequencer programs also allow for more precision in cut-up operations, as one can zoom in on the sounds and surgically manipulate them at a micro level. Whether the musical goal is to audibly reassemble tracks from different recordings, to discreetly juxtapose different takes of a single performance, to make "loops," to cut out unwanted noise and sounds, or to make sonic and rhythmic effects that expose the operation itself, the cut-and-paste tool has become fundamental to the production of contemporary popular music. As "Break" exemplifies, cut-up techniques have the ability to significantly augment the compositional palette of music makers and, consequently, the aesthetic preferences of music listeners.

The Double Meaning of Aestheticized Malfunctions

The stuttering and skipping sounds of "Break," as well as its signal dropouts, are likely intended and/or interpreted to be imitations of the technological malfunction or glitch of a CD player that has problems reading the information on a scratched disc—an unfortunately familiar sound to most of us.[278] The stuttering sounds also evoke a computer program that halts or freezes during playback of an audio file. Audio files require a large amount of processing power from the computer, and in the 1990s,

[276] Quoted in Lewisohn, 1988: 72.
[277] Cutler, 2009: 149.
[278] "Glitch," which originates in the Yiddish term "glitshn" (to slide or skid), is often used to describe a defect or error, often in computer software or hardware.

when processing power was still quite expensive, the computer's playback of audio files often ended in hiccups or crashes due to buffer underruns.

Other artists have produced sonic skips and stutters similar to the ones in "Break" by generating actual technological glitches. For instance, the Japanese artist Yasunao Tone (who was active in the Fluxus movement in the 1960s) and the German electronica trio Oval stuck bits of pin-punctured Scotch tape on the data side of the CD in order to produce skipping and stuttering sounds.[279] Oval also produced such sounds by fast-forwarding the CD during playback or doodling with a pen on the back of the CD and recording the result.[280] Skips and stutters are, however, much easier to achieve using the cut-and-paste tool than they are to generate on their own. As Caleb Kelly points out in *Cracked Media: The Sound of Malfunction* (2009):

> It is seemingly far too easy to cause a CD to skip and stutter; it appears at times that the slightest scratch causes the CD to skip just at the best part of one's favorite track. The irony is that the deliberate forcing of a CD to skip is a very delicate operation.[281]

While scratches or marks on a vinyl disc will make the stylus of the turntable literally jump or slide across the physical grooves of the disc, a CD skip results only when the laser of the CD player reads the binary codes of the CD incorrectly. Any minor loss of data inscribed in the CD, however, is automatically overridden by the player's error correction system, and any major loss will mute the sound or stop the CD from playing altogether. It is the betwixt and between here that results in a sonic jump, skip, or hang.[282] Like the group Oval, mentioned above, the members of DJ Food seem to be fascinated with the rhythmic and sonic complexity of glitches, but instead of privileging the chance indeterminacy of natural glitches (like Tone, for example), they have carefully manipulated these effects using the cut-and-paste tool.

Just as the operation behind the cut-and-paste tool is not an inherently *digital* phenomenon, the digital does not have a corner on the market of aestheticizing malfunctioning technology. The aesthetic qualities of technological glitches, and their

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[279] Marclay and Tone, 2009: 341–47. See also Kelly, 2009: 236 and Sangild, 2004: 261.
[280] Kelly, 2009: 254–57. This technique is, for example, used on their commercially successful second album *Systemisch*, released at the German independent record label Mille Plateaux in 1994. This label would prove central to the "glitch movement," which will be discussed shortly.
[281] Kelly, 2009: 217.
[282] Kelly, 2009: 77.

ability to undermine or renew existing aesthetic preferences, have been recognized for decades. For instance, the sound of malfunctioning technology played an important part in the avant-garde art movement known as Fluxus, the members of which were greatly inspired by the sonic performances of John Cage. Milan Knížák, a Czechoslovakian artist closely associated with Fluxus, is famous for his work titled *Destroyed Music* (1963–79), which consists of four cut-up quarters of different vinyl discs that are glued together and played like any other record.[283] Swiss-American Christian Marclay anticipated both Tone and Oval's operations upon the CD by sticking different things to the surface of the vinyl record in order to produce abrupt transitions between sound sequences. Marclay is also known for his 1985 release *Record Without a Cover*, which was sold without a protective package or sleeve with the intention that the sonic result of the inevitable wear-and-tear damages (scratches, dust, and fingerprints) would be regarded as part of the work.[284]

During the late 1990s, musical glitches saw a revival through the subgenre of electronic music that came to be labeled "glitch" (but was also referred to as "microwave," "sinecore," and "microscopic music"),[285] which was characterized by its practitioners' exploration of malfunctioning digital technology.[286] The success of what *Wired* journalist Erik Davis calls "electronic pop stars,"[287] such as the Warp[288] artists Aphex Twin (Richard D. James), Autechre (Sean Booth and Rob Brown), and Squarepusher (Tom Jenkinson) (who all have a glitch-inspired cut-and-paste approach to their music), has contributed to the popular appeal of digital musical glitches, which can now be found in more mainstream contemporary popular music as well.[289]

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[283] Kelly, 2009: 144.
[284] Kelly, 2009: 150–84.
[285] Cascone, 2000: 12.
[286] Notable glitch artists include Alva Noto (Carsten Nicolai), Autopoieses, Farben, Frank Bretschneider, Kid 606, Kit Clayton, Pansonic, Pole, SND, and Vladislav Delay. Independent record labels that have been central to the global glitch movement include Mego (Vienna), Mille Plateaux (Frankfurt), Thrill Jockey (New York), Touch (London), and Warp (Sheffield/London). For discussions of glitch music, see, for example, Bates, 2004; Cascone, 2000; Kelly, 2009; Prior, 2008; Sangild, 2004; and Young, 2002. See also Harkins, 2010, for a discussion of two artists—Akufen and Todd Edwards—who have fused the glitch aesthetics with house music.
[287] Davis, 2002.
[288] Independent British record label Warp is located in London but was founded in Sheffield in 1989.
[289] Listen to, for example, Aphex Twin's "Windowlicker" (*Windowlicker*, Warp, 1999), Squarepusher's "My Red Hot Car" (*Go Plastic*, Warp, 2001), and Autechre's "Gantz Graf" (*Gantz Graf*, Warp, 2002). In order to achieve a similar effect as cut-and-paste, these artists, who all work with sounds within a micro time scale, have probably also made use of digital

Their shock effect, of course, has consequently paled in comparison to the era when Knížák and Marclay used them to their own radical aesthetic ends; as Kelly points out, stuttering and skipping sounds "are now simply another part of the sound palette of the digital producer."[290] In their analysis of Madonna's "Don't Tell Me," Anne Danielsen and Arnt Maasø suggest that the track's cut-ups, which cause an acoustic guitar to freeze and flow in succession, might at first be mistaken for actual technological glitches, before the listener begins to reframe them as intentional musical gestures.[291] Although the sonic effects of "Don't Tell Me" are similar to those in "Break," the latter's cut-ups are hardly likely to cause such confusion, since their rhythmic and cyclical nature is revealed right from the start.

However, these sounds are not so easily released from their association with technological failure. Malfunctioning sounds usually alarm us in relation to a problem or fault, and we most often react to them with frustration or unhappiness. Such sounds are hard to use subtly but instead tend to draw immediate attention to themselves. When these traditionally undesirable and certainly unmusical sounds are used to musical ends, they challenge our dichotomy between interior and exterior sounds in relation to the music itself.[292] In chapter 1, I distinguished between the categories of "intramusical mediation" and "extramusical mediation," or mediation that is heard to be part of the music (the music's interior) and mediation that is not (the music's exterior). While we are all likely to agree that some mediating processes are part of the interior and some are exterior, opinions will diverge as to *which* of them belong to one category versus the other. The sounds of technological glitches are particularly interesting in this regard. Even if we understand the signal dropouts in "Break" to be "missing" parts of the music, we want them to be part of the composition (we know that they are meant to be there). Similarly, skips and stutters designed for aesthetic purposes are not what we traditionally think of as music either, yet they are somehow more artful and musical than glitches occurring naturally. This produces a further

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granular synthesis, that is, a digital sound synthesis method that is based upon numerous microsamples (or sonic "grains") of 1 to 100 milliseconds (Roads, 2000: 168–84). For further discussions of how granular synthesis works, see Roads, 2001 and Traux, 1988.

[290] Kelly, 2009: 10.

[291] Danielsen and Maasø, 2009: 130–32.

[292] This dichotomy also recalls the relationship between "textual silence" and "medium silence" discussed in Danielsen and Maasø, 2009. While textual silence is part of the written or performed work, medium silence results from an error in the medium (Danielsen and Maasø, 2009: 129–32).

ambiguity, or perhaps a sense of double meaning: the skips and signal dropouts are at once a musical play with *unmusical* elements and *musical* elements in their own right.

We might clarify the notion of the glitch sound's double meaning by turning to Linda Hutcheon's description of the double meaning that characterizes irony and parody. She recalls Ludwig Wittgenstein's metaphor of the rabbit/duck (similar to Janus's two faces/a vase)[293] to exemplify how one and the same thing might be experienced in two ways. Contrary to Ernst H. Gombrich (1969), who argues that we are *not* able to experience both readings of this metaphor simultaneously, Hutcheon suggests that, in the case of irony, we can: irony "implies a kind of simultaneous perception of more than one meaning . . . in order to create a third composite."[294] She then refers to Stanley Eugene Fish (1983), who argues that the experience of ironic meaning involves a process in which the literal meaning is cancelled out by the recognition of the "true meaning." According to Hutcheon, such assertions in fact limit the scope and impact of irony, because "this *either*/*or* theory does not account for the inclusive and simultaneous nature of ironic meaning."[295] Instead, she suggests that, within an ironic frame, different meanings might be working *together* in order to create something new.[296] Similarly, some of the aesthetic power of malfunctioning sounds resides in their ability to be simultaneously experienced as the music's interior *and* exterior—our understanding of the glitching sounds as musical *coexists* with our understanding of them as sounds that disrupt the music. The meaning and function of glitch sounds inserted within a musical context are thus "both different [from that of actual glitches] and the same," to borrow Hutcheon's turn of phrase.[297] Put differently, sounds implying technological malfunctions challenge our traditional positioning of the border between the music's interior and exterior while at the same time reinforcing our need for one.

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[293] This rabbit/duck figure, which Ludwig Wittgenstain introduced in his *Philosophical Investigations* (1953), and which was later used by Ernst H. Gombrich in his *Art and Illusion: A Study in the Psychology of Pictorial Representation* (1960), alternately appears as one or the other creature—what might be interpreted as a bird's bill might also be seen as the ears of a rabbit, and what might be interpreted as the duck's occiput might also be seen as the rabbit's nose, and so on. See Hutcheon, 1994: 59–61.
[294] Hutcheon, 1994: 59–60.
[295] Hutcheon, 1994: 61. Emphasis in the original.
[296] Hutcheon, 1994: 63.
[297] Hutcheon, 2006: 166.

Music within the Music

Another reason why cut-up sounds seem to straddle interior and exterior is that they disrupt the musical recording/production medium's realistic and transparent narrative or traditional representation of a spatiotemporally coherent performance. While we are, in our current mediatized culture, very familiar with fragmented music that exposes its technological mediation, this is a relatively new phenomenon, as is music recording and reproduction itself; as pointed out in chapter 2, recording was invented only a century ago, and before then, music was always-only live and comprehended as such. The skips and stutters of "Break," then, are powerfully incongruent with our deep roots in understanding music as a spatiotemporally coherent singular performance. Yet they do not *completely* dismiss this understanding, because "Break" is not based purely on technological glitches. (This, however, was exactly the case with the music produced by Japanese experimental composer Otomo Yoshihide and Australian "sound artist" Michael Graeve, who recorded the sounds produced by "playing" a turntable without placing a vinyl disc on it at all.)[298] In "Break," the audible cut-ups are, as in much other glitch-inspired popular music, instead staged as passing effects, between which we might sense a coherent musical performance.

The additional fact that "Break" suggests associations with the jazz genre and a onetime coherent vocal performance strengthens the presence of a "traditional" musical performance underpinning DJ Food's experimentation. These associations are, for instance, triggered by the fact that the piano performs "jazz chords," and by the fact that neither the piano nor the drums in "Break" sound "programmed." Although jazz is often fused with electronica music, it is also seen as a live genre that values spontaneity and improvisation; jazz recordings are in effect often smoothly conceptualized as the documentation of a live performance in which the music is performed in a single spatiotemporal setting by a co-present ensemble and recorded in a single take. The vocal sample in "Break" by Lightnin' Rod carries some of the same associations. While any sample from this rap pioneer will bring with it much political and cultural baggage, its status as voice alone represents, first and foremost, an indexical sign of the human body and thus a clear path from source through musical performance to recording. Of course, a straightforward, unmediated performance of the lyrics would obviously be very different from the vocal constellation in turn

[298] See Kelly, 2009: 188–208.

presented in "Break," which chops up the lyrics into a staccato musical form while removing the natural resonances of the sounds, as we saw above. When the voice is manipulated to such a significant degree, we might assume that its role would change from bodily expression to purely musical sound. Yet our tendency to associate it with a human body that is delivering a message remains strong. Barry Traux points out, "The first sounds to which the ear is exposed as it develops in the fetus are human sounds, and from that point onward, the voice and human soundmaking are the sounds to which we are most sensitive as listeners."[299] The voice is, he continues, "a reflection of the whole person."[300] Certain qualities and limitations are therefore associated with the vocal line in music, but "Break" upends them. Thus the vocal line sampled in "Break" and the instrumental passages' inspiration from jazz strengthen our expectations around traditional musical performance even as the cut-up sounds of the production disrupt them. We are left to comprehend "Break" as consisting of two layers of music, the traditional and the manipulated, neither of which, in this precise context, makes sense without the other. We might even end up with the impression of a recording that presents music within the music, as if the traditional performance constitutes the layer of music that is interrupted by the other musical layer of cut-ups and glitches.[301]

The notion that our genre conventions contribute to strengthening the impression of two layers of music might be further clarified using Los Sampler's *Descargas* (Rather Interesting, 2000). The cover art of this album consists of a picture of the five (fake?) members of Los Sampler's, all of whom have Latin American looks.[302] From this image, then, we might well expect music that is more traditional

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[299] Traux, 2001: 33.
[300] Traux, 2001: 34.
[301] Using the theories of Albert S. Bregman, we could describe our experience of this music as consisting of different auditory *streams*. In *Auditory Scene Analysis* (2001), Bregman discusses how our brain structures complex auditory information into separate streams—for example, how it enables us to locate and identify a voice in a crowd or an instrument in a musical ensemble. He explains this process of grouping either as happening naturally and automatically (he calls this "primitive integration") or as happening on the basis of earlier experiences and learned restrictions (he calls this "schema-based integration"); see, for example, Bregman, 2001: 1–45. The latter applies to the two layers we might perceive in "Break": because of our deep roots in conceptualizing music as a spatiotemporally coherent performance, we are likely to hear the music as consisting of a performance (one layer) and of sounds that are interrupting this performance (the second layer).
[302] According to the liner notes, Los Sampler's consists of seven men with names of Latin American origin, and the band is produced by "Atom™"—one of the many monikers of the German music producer, or all-in-one-musician, Uwe Schmidt (famous for his Señor Coconut

than experimental, and we would be right, to an extent. The album is based on traditional Latin (especially Cuban) music forms, such as the "son," the "descarga," the "cha-cha-cha," and the "mambo," and the performances feature typically Cuban instruments, such as the Cuban *tres* (a guitar with three courses or groups of two strings, tuned in a major chord), the classical nylon-string guitar, the double bass, and percussion instruments such as the shaker, the claves (a pair of short thick clubs), and the bongo (an attached pair of open-ended drums). The clave rhythm—a five-stroke rhythmic pattern—is central to this music, as are rhythmic and melodic repetitions in general; male singers deliver the Spanish lyrics of the album polyphonically. *Descargas* does not attempt to represent the current Cuban music scene but rather gives a nostalgic impression of an exotic and authentic past, when music was relatively unmediated by technology and delivered by co-present musicians singing live and playing traditional instruments.[303] However, in addition to these traditional Cuban music performances, *Descargas* is full of sonic glitches.[304] The incongruity we here experience between a traditional Cuban music performance and the exposure of malfunctioning technology strengthens, in a manner similar to "Break," the feeling that the music consists of two layers. This incongruity is even mirrored in the title of the album: *Descargas* might refer either to a jam session—which usually means a spatiotemporal coherent performance—or to the act of discharging, rejecting, or denying performed by the malfunctioning sounds upon the spatiotemporally coherent performance.

Music such as "Break" and *Descargas* disturbs the recording/production medium's realistic representation of a traditional performance at the same time as it underlines it; we would not experience these sounds as cut-ups, medium glitches, or

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project). The fact that Schmidt is recognized for his musical humor as much as his musical talent might make us question whether Los Sampler's really is a Latin American combo or just one of Schmidt's many solo projects featuring guest performers.

[303] Both the vocal performances and the music here are very much in the same style as that of the successful *Buena Vista Social Club* album (1997). Made by Cuban musician Juan de Marcos Goxález and American guitarist Ry Cooder, these performances had Cuban musicians performing traditional music in the vein of the Havana musical scene in the 1940s and 1950s.

[304] Interestingly, while we might expect that the Cuban music has been sampled and then warped, the Spanish lyrics reveals that the music was, in fact, created in order to be warped. For example, the lyrics on "El Nuevo New Looks (Son Chueco Cerebral)" read: "This is the 'son,' which is super-warped, out of tune, without meaning and without message, just mental message." Similarly, the lyrics on "El Rey de las Galletas (Soy Yo) (Rumbo Galleton)" read: "I invented the 'galletas,' listen Señor, how they are crunching. I am the king of the 'galletas,' that's me." *Galletas* refers here to "those very short digital clicks you can hear all over the album" (translation in the liner notes of *Descargas*).

signal dropouts if we were not aware that there was something to be glitched or missed. The cut-up techniques make the listener aware of the recording/production medium's double function, to mediate and to *be* that which is mediated—it presents itself while it mediates or represents something else.[305] The conventions of the recording/production medium as a transparent mediator, and of music as a coherent performance, are at once "inscribed and challenged, used and abused," to borrow Hutcheon's description of some postmodern art (which in fact can have many similarities to contemporary popular music in which the mediation is exposed).[306] Once again, it is the music's contradictory double meanings—it both is and is not a traditional performance; the glitches both are and are not part of the music—that supply its compelling tension.

Conclusion

Cut-ups and signal dropouts arguably draw immediate attention to themselves because of our associations of these sounds with malfunctioning technology, and because we understand them to be the result of the schizophonic process of splitting the sounds from their temporally coherent origins. However, since glitch sounds have become ubiquitous in music (not only in electronica but also in mainstream genres such as pop), they are now seldom mistaken for unintended "natural" glitches and thus no longer generate a shock effect. Thanks to this normalization, Phil Thomson wonders whether they have enough aesthetic power to survive. He suggests that the "aesthetics of failure," referring to the title of Kim Cascone's article from 2000 about glitch music, "might be on its way to being simply a failure of aesthetics."[307] I have, on the other hand, argued that although glitch sounds such as skips and stutters no longer surprise us, they are still entangled in associations of malfunctioning technology, which creates a double meaning on several levels. The sounds both are and are not comprehended as musical sounds; they both constitute and disturb the music. Similarly, they both disrupt and sustain the music's flow, and they both strengthen and subvert the representation of a spatiotemporally coherent performance. By being experienced as disruptive in this way, they emphasize both the recording/production medium's ability to transparently mediate a message *and* its

[305] This recalls, of course, Louis Marin's notion, presented in chapter 1, that "to represent" means to *present oneself* as representing *something else* (Marin, 1991: 60).
[306] Hutcheon, 1989: 136.
[307] Thomson, 2004: 214.

constant participation in that message. In fact, none of the metaphorical breakdowns in "Break"—such as the breakdown of the medium, the breakdown of the musical flow, or the breakdown of the representation of a coherent performance—is a breakdown in the literal, totalizing sense. These musical conventions are broken down but at the same time sustained, and this double meaning is part of the aesthetic quality of these cut-up sounds.

However, if the cut-up sounds' double meaning is not recognized—if they are instead experienced like any other sound, free from their association with malfunctioning technology—I would still maintain that their sound quality alone can be tremendously compelling and carry the day. Glitches, cut-ups, and dropouts have extended the music maker's compositional palette. Dropouts consisting of digital silence represent a new and unique musical element with a peculiar effect upon rhythm and sound. While musical "groove" might traditionally be understood as the interaction between sounds and traditional rests, signal dropouts are neither. Consequently, as listeners grow accustomed to their extensive use, the concept of "groove" itself will likely be extended. Moreover, the traditional instrumentation that usually constitutes the foundation of the groove and sound can be replaced or supplemented by the sounds of skips, cuts, and stutters.

Since digital technology allows for software programs that can be repaired or updated at will, and the digital sound represents completely high fidelity (see chapter 4), the consumer might have the impression that digital technology is near to perfection. Given this backdrop, glitch-inspired music might be regarded as a self-reflexive critique of this "perfection," or as "work which inhabits the cracks in the digital dream" as Thomson has put it.[308] While such a critique is not always intentional by the music makers, it can nevertheless be understood as a critical commentary from within; the music's exposure of digital technology's potential malfunctions itself contributes to removing the digital medium from its pedestal.

While malfunctioning technology usually leaves us helpless and frustrated, contemporary popular music inspired by glitches, such as "Break," is, with the help of the virtual cut-and-paste tool, taking control over these "unwanted" sounds—inserting them in the music with milliseconds of precision, mangling them in tasteful (or *un*tasteful) ways, and thus transforming them into musical gestures in their own

[308] Thomson, 2004: 214.

rights. Of course, not everyone will appreciate these sounds' subtlety—there are those who are simply unable to hear the minor malfunctions or spurious signals as musical gestures, or at least not as *appealing* musical gestures. While some will regard this aesthetics of failure as a failure of aesthetics, others recognize in these sounds the potential to become signifiers of artistic mastery, and the music that realizes them as a new frontier in the digital age.

Chapter 6

Mash-Ups and Digital Recycling:

Justin Bieber featuring Slipknot

If "schizophonia" points to the splitting of sounds from their sources, then music recycling is its emblematic form.[309] In recycled music, sonic sequences of otherwise "complete" music productions are split from their original contexts and inserted into new compositions. While musicians have been quoting music for centuries in the sense of rewriting and reperforming already existing musical ideas, the practice of recycling musical "readymades," or "found sound"—recorded sequences of already existing music—is obviously premised on recording technology.[310] Hence, John Oswald terms the latter "electro-quotations," highlighting the technological mediation involved in the process. Such "electro-quotations" can be found in, for instance, the collage techniques of *musique concréte* and the avant-garde, in Jamaican dub music and hip-hop practices of remixing and sampling, and in comedy records and radio shows. While music recycling, in terms of the employment of "electro-quotations," has been part of popular music throughout the twentieth century (or at least the latter half of it), the technique was facilitated by the digitalization of technology.

In the digital age of reproduction, of course, "electro-quotations" are more commonly referred to as samples. That is how I will use the term "sample" in this chapter—as an extracted musical sequence from an existing recording.[311] As mentioned in chapter 2, the digital sampler instrument was initially only able to record very short time sequences of sound. When digital samplers became more

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[309] Parts of the discussions in this chapter appear in, or are revised from, Ragnhild Brøvig-Hanssen and Paul Harkins (2012): "Contextual Incongruity and Musical Congruity: The Aesthetics and Humour in Mash-Ups," *Popular Music* 31/1, pp. 87–104. Other parts will be appearing in Ragnhild Brøvig-Hanssen (forthcoming): "Justin Bieber featuring Slipknot: Consumption as Mode of Production," in *Music and Virtuality*, eds. Sheila Whiteley and Shara Rambarran (Oxford: Oxford University Press).

[310] Serge Lacasse labels the former—musicians recreating musical references—"allosonic quotation," and the latter—the physical copying of musical references—"autosonic quotation" (Lacasse, 2007: 38–39). Lacasse here borrows from Nelson Goodman's terms "allographic" and "autographic," which Goodman introduces in *Languages of Art: An Approach to a Theory of Symbols* (1968); see Lacasse, 2007: 38, fn. 11.

[311] For a discussion of some of the different meanings of the terms "sampling," see Kvifte, 2007b: 106–8.

powerful and economically affordable in the late 1980s, hip-hop pioneers soon recognized this machine's ability to facilitate their already established practice of extracting sound sequences from existing recordings. To this point, sample-based music was usually created mainly during live events in which DJs used two turntables in the following fashion: they played a selected music sequence from a vinyl record in isolation on one turntable while preparing another isolated sequence for playback on the other turntable. In this way, they could (via the two turntables) make music in which different samples occurred in succession or the same sample was repeated over and over (in the latter case, the two turntables play the same record). All of these physical operations were supplanted by the simple push of a button; the digital sampler could record a sequence, store it, and play it back as dictated by the consumer, and, moreover, it could easily loop the sequence as well as play several samples back simultaneously. Thanks to its affordances, the digital sampler soon became a prerequisite for most hip-hop groups, which in turn guaranteed an influence upon the genre, as well as popular music in general, that persists today. The present ubiquity of samples in popular music has, in turn, become a signature of *digital* mediation.

Scholars such as Mark Katz (2012), Adam Krims (2000), Tricia Rose (1994), and Joseph G. Schloss (2004) have provided valuable insights into the sampler instrument's impact upon popular music. In this chapter, I will not focus on the sampler instrument as such but instead discuss how the use of Digital Audio Workstation (DAW) programs has generated a new twist on the practice of recycling music that has given rise to an entire genre called mash-up music, which first came about at the turn of the twenty-first century.

While mash-up music usually combines two full-length samples, I will begin this chapter by arguing that the mash-up concept should not be restricted to a particular juxtaposed musical form of any character at all but must be assigned at least two governing principles: (1) that there be a musical dialogue between the mashed tracks; and (2) that there be a use of samples that are contextually or ideologically incongruent. I will then discuss the role of digital technology in its development and the recognition of mash-up music as a signature of digital mediation. After this contextualization of the mash-up aesthetics, I will analyze the recent mash-up "Psychosocial Baby," produced by Steven Nguyen (aka Isosine), which combines Slipknot's "Psychosocial" with Justin Bieber's "Baby." I will explore both the

production process behind this mash-up and the ways in which this mash-up might generate a unique musical experience, emphasizing that part of the meaning of mash-ups lies in their intertextual play and the matrix of significations inscribed within them. I will also examine the listener's role in the production of meaning making and, ultimately, in the realization of the mash-up as a mash-up.

Mash-Ups as a Digital Signature of Music Recycling

Michael D. Ayers describes a musical mash-up, very simply, as a production "in which the creator takes two or more tracks and blends them together."[312] While this is true, as far as it goes, such an inclusive understanding appears to encompass much hip-hop music, as well as remixes, medleys, and other sample-based productions as well—any juxtaposed form, in short, that might also be characterized as a *montage*, *collage*, *bricolage*, *detourage*, or *palimpsest*. Ayers's description mirrors the ways in which "mash-up" is used in fields such as film and other visual media to describe a work that brings distinct prefabricated sources together.[313] The musical version, however, needs something more: here, a mash-up usually implies a production in which two recognizable recordings (or full-length samples) are synchronized in such a way that the vocal of one work with an instrumental version of another, without significant structural edits to either party. John Shiga calls this "the standard 'acapella [*sic*] + instrumental = mash-up' formula,"[314] or we might say the typical A+B form of the mash-up. A more pragmatic use of the term mash-up, in other words, points to a *particular* form of juxtaposition. This definition, though, is also problematic because it is not inclusive enough, because mash-ups have grown to encompass a variety of styles based upon the fact that some producers mash more than two tracks and/or add their own musical material to the work. In musical settings, as well, the term "mash-up" has an air of illegality, because most musical mash-ups do not reflect any request for permission to use the sampled material (this is why "mash-up" is sometimes used synonymously with terms such as "bootleg" or "bastard pop").[315] Some mash-ups do employ authorized samples, however, so legal transgression is not a requirement.

In the article "Contextual Incongruity and Musical Congruity: The Aesthetics and Humour of Mash-Ups" (Brøvig-Hanssen and Harkins, 2012), we suggest that,

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[312] Ayers, 2006: 128.
[313] See Gunkel, 2008: 504.
[314] Shiga, 2007: 110.
[315] See, for example, Shiga, 2007.

instead of some particular form of juxtaposition or an air of illegality, the mash-up is in fact defined by a complex musical aesthetic based upon two key concepts: musical congruity—in the sense that there has to be a dialogue between the juxtaposed tracks—and contextual incongruity (the feeling of subverted conventions).[316] Regarding the second concept, mash-ups are often intended to violate the conventions of otherwise established categories, such as high and low, serious and playful, black and white, mainstream and underground, or rock and pop. Mash-up producers Mark Vidler and Jeremy Johnson both state that they always try to juxtapose samples from very different musical styles,[317] and *Salon* journalist Roberta Cruger argues, "The more disparate the genre-blending is, the better; the best mash-ups blend punk with funk or Top 40 with heavy metal, boosting the tension between slick and raw."[318] If mash-ups are to be understood as more than a one-liner or act of genre-bending bravado, however, they should also function on a musical level, establishing a musical dialogue between the mashed tracks. If, for instance, the musical elements compete for the listener's attention, the aesthetic result might be the experience of hearing two colliding recordings rather than one coherent track. Shiga quotes one contributor to the mash-up website GYBO who points out that talent within a mash-up setting is "the capacity to recognise shared properties between different songs, or the capacity to reorganise the musical and aural relations of recordings so that they sound like they are *components of the same song*."[319] Put simply, the *art* in the mash-up is in its juxtaposition of samples to produce a coherent piece of music that at the same time generates a feeling of incongruity.

Implicit to the creation of a feeling of incongruity is the sampling of musical material that the listeners will recognize. John Oswald points out that music differs in a fundamental way from literature when it comes to how one presents the works of others:

> Musical language has an extensive repertoire of punctuation devices but nothing equivalent to literature's " " quotation marks. Jazz musicians do not wiggle two fingers of each hand in the air, as lecturers often do, when cross referencing

[316] Following Arthur Schopenhauer, I think of incongruity as a mismatch between concepts, or between the standard way of thinking about something and the way it is in fact presented (Morreall, 1987: 45–64).
[317] Preve, 2006.
[318] Cruger, 2003.
[319] Shiga, 2007: 103. My emphasis.

> during their extemporizations, because on most instruments this would present some technical difficulties—plummeting trumpets and such.[320]

The sonic quotation marks around samples in contemporary popular music are variously apparent. Some samples are too short, too hidden, or too manipulated to be recognizable as such, so they are barely acknowledged as quotations at all. Others, however, are presented in such a way that we cannot help but link them with their sources (or, at the very least, hear them with the full understanding that they have original sources, even if we do not know what they are). In the latter situation, we experience the mediation as opaque, because the samples reveal themselves as what they are: extractions from an existing recording that have been inserted into a new context via some technological means. Mash-up music is premised on big quotation marks—that is, on our ability to recognize the music as consisting of samples, and thus represent, in Linda Hutcheon's words, "a move away from the tendency, within a Romantic ideology, to mask any sources by cunning cannibalization."[321] Because mash-up music sonically acknowledges its foundation in samples, the genre itself constitutes a signature of music recycling. Moreover, as I will discuss below, mash-up music is usually understood to represent a *digital* signature of mediation.

Kembrew McLeod argues: "The mashup phenomenon could not have happened without the simple [DAW] programs that allow amateur bedroom composers to juxtapose two or more songs in interesting ways"; he then adds, "Mashups also couldn't have happened without the digital distribution power of the Internet."[322] However, it remains true that mash-ups actually could be made using analog tape technology (though the process is very time consuming) and be distributed via cassette and vinyl, which can be exemplified by *The Whipped Cream Mixes* by the Evolution Control Committee. The Evolution Control Committee claims to have used a four-track cassette deck and a turntable without pitch control to combine "Bittersweet Samba" and "Whipped Cream" from Herb Alpert's Tijuana Brass album *Whipped Cream and Other Delights* (A&M, 1965) with vocal tracks from Public Enemy's "Rebel without a Pause" (*It Takes a Nation of Millions to Hold Us Back*,

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[320] Oswald, 1985.
[321] Hutcheon, 2000: 8.
[322] McLeod, 2005a: 83. In fact, DAW programs such as Sony's Acid, Ableton's Live, and Image-Line's Fruity Loops are, according to John Shiga, frequently cited as the key factor in the development of mash-up music (Shiga, 2007: 97).
[322] Walker, 2008.

Def Jam, 1988) and "By the Time I Get to Arizona" (*Apocalypse 91 . . . The Enemy Strikes Black*, Def Jam, 1991). The homemade cassette, which they self-distributed in 1994 via cassette and vinyl media, was given the name *Gunderphonic* (an allusion to John Oswald's controversial copyright-infringing CD *Plunderphonic* [bootleg, 1989]), but its two influential mash-ups became known as *The Whipped Cream Mixes* when they were re-released as a seven-inch vinyl single by the record label Eerie Materials in 1996.[323] Like modern mash-ups, *The Whipped Cream Mixes* explore the combination of contextual incongruity and musical congruity. The incongruity between Herb Alpert's Tijuana Brass and Public Enemy is obvious to anyone familiar with these artists. The protest songs of Public Enemy are well known for addressing racism and other sociopolitical problems in America. Herb Alpert's Tijuana Brass, on the other hand, had no agenda other than entertaining their vast and diverse 1960s audience (their concerts were arranged like revues, where Alpert, as trumpeter and bandleader, performed comic routines between the songs that were often written by the American comedian Bill Dana). The success of these two mash-ups is also premised on the *shared musical properties* of the mashed tracks. For instance, in the mash-up "By the Time I Get to Arizona," both Chuck D's vocal performance and Herb Alpert's music (in this case, from the song "Whipped Cream") are subdivided into straight sixteenth notes and based on a like schema of periodic phrases, and they even tend to feature the same gestures and pauses, which makes them sound oddly synchronized. In short, we hear a musical dialogue despite their profound contextual dissimilarities that makes this otherwise bizarre juxtaposition work as a coherent piece.[324] *Salon* journalist Charles Taylor describes the result of this pre-digital mash-up as "hilarious": "Every time Chuck D lights into some new target of his righteous rage you hear those horns saying, 'Lighten the fuck up!'"[325]

While mash-up music is not *exclusively* a digital phenomenon, then, it only came to characterize an entire genre after 2000 or so. It was producers like Richard X (Girls on Top), Mark Vidler (Go Home Productions), and Roy Kerr (the Freelance Hellraiser) from the UK, as well as Soulwax (2 Many DJs) from Belgium, who ensured that mash-ups became a pop phenomenon at the turn of the twenty-first

[323] See evolution-control.com/sounds/gunderphonic (11.27.12).
[324] See Brøvig-Hanssen and Harkins, 2012, for an in-depth analysis of this mash-up.
[325] Taylor, 2003.

century.[326] If the mash-up scene was initially mostly British, it soon went global, thanks to web forums such as GYBO (Get Your Bootleg On)[327] and underground clubs devoted to mash-up music.[328] Ultimately, the scene generated a lot of media attention, including reviews by major news publications such as *Newsweek* and the *New York Times*.[329] Part of the reason for this, of course, was the tendency of mash-up producers to use copyrighted material without clearance. In the mid-2000s, in fact, several mash-up producers and distribution networks received cease-and-desist orders from various music copyright holders. The political consequences of particular mash-up projects, such as Danger Mouse's *The Grey Album*, which I mentioned in the introduction to this thesis, contributed to mash-up music's fame and even ignominy. Yet while the mash-up cyberspace community saw illegality as a source of cultural capital, at least at the beginning, legal mash-ups produced with the permission to use their musical material started to emerge as well.[330] By 2005, MTV had launched the U.S. television series *Ultimate Mash-Ups*, and trendsetting radio stations such as New York City's K-Rock, San Francisco's Live 105, and Los Angeles's Indie 103 started to broadcast mash-ups, which increased the popularity of both producing and listening to them.[331]

One important reason for why mash-up music first became a pop phenomenon in the *digital* era was, as McLeod rightly points out, because of the usability and accessibility of DAWs as well as the vast musical archives and new distribution channels offered by the Internet. Cheap (or free) DAW programs and the increasing affordability of powerful computer hardware began to encourage those who once

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[326] Girls on Top received particular attention with "We Don't Give a Damn About Our Friends" (Tubeway Army vs. Adina Howard) in 2000, 2 Many DJs with "Smells Like Teen Booty" (Nirvana vs. Destiny's Child), the Freelance Hellraiser with "A Stroke of Genius" (the Strokes vs. Christina Aguilera) in 2001, and Go Home Productions with "Ray of Gob" (Madonna vs. the Sex Pistols) in 2003.

[327] The mash-up website GYBO has been one of the most popular forums for mash-up producers and fans, all of whom can vote for the "Bootleg of the Year," post mash-up reviews, links, and events, and discuss production techniques as well as legal issues (see www.gybo5.com). Other mash-up sites include www.mashstix.com, www.mashuptown.com, www.mashupciti.com, www.mashuphits.com, and www.bootimashup.com.

[328] See Howard-Spink, 2005, and Shiga, 2007: 94.

[329] Shiga, 2007: 94.

[330] A case in point is *Mashed*, released by EMI in 2007, which was produced by Mark Vidler (Go Home Productions) and Laurent Lupidi and Jeremy Johnson of the group Loo and Placido; it contains juxtapositions such as Madonna vs. A Taste of Honey, David Bowie vs. Liberty X, Peggy Lee vs. Iggy Pop, Blondie vs. the Doors, and Kylie Minogue vs. New Order.

[331] Orlov, 2005.

thought of themselves as strictly music consumers to become music producers as well, either by creating music from scratch in these software programs, or by remixing preexisting music. Many early mash-ups can be traced to these musical "amateurs" (though several mash-up producers were already established musicians as well).[332] However, while it is true that "virtually any consumer can now play the role of producer thanks to digital music technology,"[333] as Michael Serazio writes, I will later in this chapter argue that the production of mash-ups in fact demands particular skills that might be different from what we traditionally view as "musical" talent. That being said, modern DAW programs do simplify the technical aspects of the mash-up. As Shiga points out, these programs "automate many of the tedious processes formerly required to produce remixes"; he continues, "For years, software studios required users to listen closely to audio clips in order to determine tempo and key."[334] Modern DAW programs are able to match these aspects of different tracks in no time at all using auto-detection methods. Moreover, in contrast to analog speed alteration, tempo and pitch can be digitally manipulated independently of one another, allowing the speed-altered sounds to retain their original pitch levels or the pitch-altered sounds to maintain their original tempo. Digital speed and pitch changes also diverge from analog operations in terms of being able to preserve sound quality (including the essential formants)[335] and therefore produce a realistic result. In terms of separating the vocal tracks of a sample from the instrumental tracks, there are several methods (such as using an EQ filter or phase inversion), but often one can locate a cappella and instrumental versions of most anything on the Internet and go from there.

The importance of DAWs to the production of mash-ups cannot be isolated from the Internet itself, which of course shares a platform with the DAW—that is, the personal computer. The marked proliferation of mash-ups also came about as a result of the increasing availability of high-speed Internet connections and the development of peer-to-peer (P2P) networks and social networking services (such as MySpace, YouTube, and SoundCloud), all of which made it much easier to share and distribute musical files as well as obtaining a cappella and instrumental versions of tracks.

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[332] See Sinnreich, 2010: 120.
[333] Serazio, 2008: 82.
[334] Shiga, 2007: 102.
[335] "Formants" are the spectral peaks in a sound's frequency spectrum.

Mash-up producers usually download tracks encoded in mp3 format from the Internet and simply drag them into their DAW program, where they start remixing them. While audiophile-level standards have traditionally dominated popular music production (except in the various lo-fi subcultures), mash-up producers sacrifice sonic fidelity in the name of music accessibility. The digital music archive that has accumulated on the Internet, which is open to everyone, is enormous and obviously outdistances any given non-virtual archive. Almost anything is "a click away," and while they might not all be perfectly legal, there are numerous ways to download the track one seeks, and to distribute one's own music. This uncontrollable distribution platform gives bootleg music a means of survival outside of various copyright jurisdictions.

Thanks to the big quotation marks applied to the sampled sources, mash-up music makes obvious the technology involved in such practices of recycling music. Moreover, since this music genre uses the DAW as its primary tool for production, and the Internet as its primary archive of musical sources *and* its primary distribution arena, mash-up music can be seen as a product of, and thus a signature of, *digital* mediation, or more precisely, digital music recycling. In what follows, I will analyze a relatively recent mash-up, called "Psychosocial Baby," in which my focus will be both on Isosine's selection and treatment of the mashed samples and on the ways in which this music might be experienced by the listener.

"Psychosocial Baby"

Steven Nguyen, who goes by the pseudonym Isosine, released an enormously influential mash-up in June 2011 as part of his bootleg album *Mashup Manifesto*, one that consisted of the vocal tracks from the 2008 single "Psychosocial" (*All Hope Is Gone*, Roadrunner Records) by the heavy (nu)metal band Slipknot, and the instrumental tracks from the 2010 smash hit "Baby" (*My World 2.0*, Island, RBMG) by the Canadian teenage-pop phenomenon Justin Bieber. The video that features "Psychosocial Baby" has today achieved almost eleven million views on YouTube. Since the primary distribution channel for "Psychosocial Baby" is this audiovisual Internet platform of YouTube, my analysis of the music of this mash-up cannot be separated from the video that features it; the music and the video were made, and, moreover, are usually experienced as a unified piece, and they must therefore be analyzed as such.

When mashing Slipknot's "Psychosocial" with Justin Bieber's "Baby," Isosine slowed the former slightly while raising the pitch by two semitones to make it fit with the harmonies and tempo of the latter. The instrumentation of "Psychosocial" is filtered out, so that only Corey Taylor's voice can be heard (or Isosine downloaded it as an a cappella version in the first place). "Baby" is not altered at all, it appears, except that Bieber's voice has been filtered out from most of the track. Both the vocal sample of "Psychosocial" and the instrumental sample of Bieber's "Baby" appear in their entirety. Technically speaking, Isosine has done little else to produce this mash-up. Because mash-ups often consist of nothing but samples, and often of merely two full-length samples that have hardly been edited at all, mash-up producers have been criticized for lacking talent and creativity; for example, McLeod writes: "Despite my appreciation of them, I do not mean to idealise mash-ups because, as a form of creativity, they are quite limited and limiting."[336] Yet, when studying how mash-up music is produced, we should not ignore the process of selecting the samples, which is arguably a musical skill in itself. As mentioned, the mash-up concept seeks to exploit a contextual incongruity between the mashed tracks in a way that associates them despite their divergence. I will start this analysis by discussing the contextual incongruity between Slipknot and Justin Bieber—that is, the fact that they present themselves and are presented by the media (and, most importantly, are usually experienced) as very different artists—before I move on to a discussion of the musical congruity and dialogue that exist between the mashed sources. These two perspectives inform both the aesthetic principles lying behind the production of this mash-up in particular, and mash-ups more generally, and the experiential effects that these principles (and their sonic result) generate.

Part of the reason for the popularity of "Psychosocial Baby," and for why Isosine blended these tracks in the first place, is that Slipknot and Justin Bieber are vastly different artists. Slipknot is a (nu)metal band that claims to be inspired by bands such as Black Sabbath, Led Zeppelin, Slayer, and Primus. Justin Bieber, on the other hand, is a teen pop phenomenon who has expressed his admiration for the music of Destiny's Child, Boyz II Men, Usher, and Michael Jackson.[337] In "Psychosocial Baby," heavy metal collides with teen pop, but more than that, Slipknot (in particular) collides with Justin Bieber (in particular).

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[336] McLeod, 2005a: 86.
[337] See Arnopp, 2011, and Falsani, 2011.

In an age when most controversial and mischievous concert-stage behaviors have become formulaic at best, Slipknot still manages to shock and offend. This is, of course, partly due to their embrace of primal stunts in the Ozzy Osbourne tradition, such as urinating, masturbating, and playing with dead animals onstage, diving from high balconies, physically abusing themselves, throwing and shooting things at the audience, and wrecking expensive equipment.[338] But what is most attention grabbing (and perhaps a little more frightening) is the way in which they present themselves as epitomizing a musical "wolfpack"[339] that is out of control and even ready to kill with its music. The band consists of no less than eight (originally nine)[340] intense and violent stock characters, each of whom wears an individually customized horror mask and coveralls marked with a number from zero to eight. Shawn "Clown" Crahan (#6), one of Slipknot's two percussionists, describes the relentless aggressive energy that characterizes the group when they are performing in concert:

> When I'm onstage and I hear the dive-bomb riff at the end of "Eyeless," I feel like destroying everything and everyone surrounding me. That's how I explain what influences me to be crazy. For me, this music is on fire. When I hear it and I hear the words, I'm free from everything and everyone. I'm going to go mental and I'll kill you if you're in my way.[341]

Slipknot's music and lyrics express a dark hatred toward the world in general that is also reflected in their theatrical music videos of doomsday scenarios. While Slipknot's way of handling the world's injustices, perceived or otherwise, might be best described by their lyrics to the track "Surfacing" (*Slipknot*, 1999, Roadrunner/Attic/I Am)—"Fuck it all, fuck this world, fuck everything that you stand for"—Justin Bieber has a decidedly more constructive and politically correct approach. He presents himself as a polite, affectionate, and humble celebrity who occasionally hugs reporters and fans, gives away concert tickets, and donates money to dozens of charity organizations and projects. Notwithstanding his young age (he was born in 1994), he claim to take his responsibility as a role model for millions of teens and tweens around the world very seriously: "It's really easy to do something

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[338] For a description of Slipknot's behavior in several of their concerts, see Arnopp, 2011.
[339] The metaphor of a "wolfpack" is borrowed from Gene Simmons, the bassist of Kiss, in his description of Slipknot as quoted in Arnopp, 2011: 221.
[340] The band's bassist, Paul Gray (#2, The Pig), died May 24, 2010.
[341] Quoted in Arnopp, 2011: 141.

good, whether it's helping an old lady across the street or, you know, just doing something small for your city, helping out picking up garbage—whatever you can do. Little things make such a difference."[342]

The members of Slipknot also take their responsibility as role models very seriously, but they are ciphers for a very different (sub)cultural group. For their fans, the most important thing is that Slipknot does not sell out but continues to represent "the others"—those who are not comfortable with society's conventions and do not fit in there. Their adoption of horror masks is, according to Slipknot's main drummer, Joey Jordison (#1), an attempt to confront society's interest in the calculatedly alluring or "perfect."[343] Similarly, Slipknot's lead vocalist, Corey Taylor (#8), explains the coverall numbers as a symbol for how far people take commercialism: "[We're] basically saying: 'Hey, we're a product!'"[344] Justin Bieber's pretty face and fashionable style sense directly validate all of the entertainment industry's standards that Slipknot criticizes. The cover of a 2011 issue of the magazine *Vanity Fair* depicted Bieber with red lipstick kiss marks all over his face, and that same year he appeared on the cover of *Rolling Stone* under the headline "Super Boy,"[345] which speaks to Bieber's mainstream appeal and sweeping popularity.

While Slipknot and Bieber present themselves, and are presented by the media, as opposing stereotypes—Slipknot as the aggressive and (appealingly) repellent and rebellious metal band, and Bieber as the mainstream, commercially and politically correct (if perhaps rather constructed) pop phenomenon—the big picture is, of course, a little more complex for both recording artists. For example, Slipknot's attempt to defeat the whole pop-cultural concept of image results in a conspicuous image in its own right, and, instead of being experienced as aggressive and frightening, it might also be considered almost cowardly to be as confrontational as they are while hidden behind a mask. Moreover, despite Slipknot's hostility and boorish onstage behavior, the members are, according to biographer Jason Arnopp, generally likeable and even relatively traditional people.[346] Similarly, while Justin Bieber's virtually bulletproof

[342] Quoted in Falsani, 2011: 177.
[343] Quoted in Arnopp, 2011: 44.
[344] Arnopp, 2011: 80.
[345] Falsani, 2011: 115.
[346] For examples, Arnopp describes Shawn "Clown" Crahan (#6), one of Slipknot's two percussionists, as follows: "He is at once a family man who loves the works of Picasso and religiously reads Edgar Allen Poe *and* a scatologically-minded maniac who boasts of eating 'poop'" (Arnopp, 2011: 136).

image might be seen as packaged and as much a product of the system as its culmination, he is also recognized for his musical talent, and according to biographer Cathleen Falsani, he is not simply a "churned out pop star."[347] She points to his frequent and uncensored activity on the online microblogging service Twitter and to his seemingly unrehearsed interviews and claims that Bieber's personality and attitude do not seem as calculated or prefabricated as many other teenage pop sensations.[348] Nevertheless, it is the oversimplified assumptions about and stigmatization of genres and individual musicians that fuel mash-up artists, who engage in a pointed play upon such stereotypical contrasts, to the delight and edification of mash-up fans.

The stereotypical differences between Slipknot and Bieber are reflected in the lyrics, the music, and the video of the mash-up. The introduction of "Psychosocial Baby" is taken from Bieber's "Baby": Bieber, who is softly singing "a-o-a-o-a-o-a" over a riff of delayed keyboard chords played in a thin, clavichord-inspired 1990 sound, is pictured in a bowling hall together with friends, flirting with a girl. So far there is no hints that this will be a mash-up. But just as Bieber's soft, prepubescent voice is to enter with the first verse of the track, we instead hear the guttural shouting of Slipknot's Corey Taylor. The music has not changed, so Bieber's vocal line might still play on in the back of our heads, with its simple, cheerful, triad-based melody: "You know you love me, I know you care / Just shout whenever, and I'll be there / You are my love, you are my heart / And we will never, ever, ever be apart." Taylor supplants this straightforward narrative of teenage love with an aggressive and monotone chant about something much darker: "I did my time and I want out, so abusive / Fate, it doesn't cut, the soul is not so vibrant / The reckoning, the sickening / Back at you, subversion, pseudo-sacred, psycho virgin." Whatever this means, it is a far cry from Bieber's flirty night out at the bowling hall.

In Slipknot's "Psychosocal," Taylor's lyrics are supported by a deep bass, two down-tuned hi-gain electric guitars playing a space-occupying percussive riff, and a steady and powerful drumbeat supplied by the band's main drummer and two

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[347] Falsani, 2011: 136.

[348] After following him daily on Twitter while writing his biography, Falsani concludes: "He either has the world's finest team of ghost writers or it really *is* him tweeting his frustration with the paparazzi at 3 a.m. from Israel, talking trash about his friend Adam Levine's basketball skills, telling his father how much he misses him and can't wait for Jeremy to join him on tour, or worrying about what he's going to wash his face with when he runs out of Proactiv on the road" (Falsani, 2011: 133).

percussionists. The mash-up abandons this aggressive and forceful music for the naive and easily digestible teen pop music of Justin Bieber. The first verse of "Baby" consists of nothing but the keyboard riff from the introduction (mentioned above), plus drums. In contrast to the massive drum sound of Slipknot's "Psychosocial," the drums of "Baby"—a compressed kick drum and a house-inspired dry and loud clap-snare (as well as some instances of a snare drum roll)—are thin and sound synthesized and programmed. While the Slipknot sound buttresses Taylor's dark message, the Bieber sound emasculates Taylor and makes him seem ironically displaced.

Taylor's vocal performance is kept at its original length, for the most part.[349] In the fourth verse, Taylor's third line, "Now there's only emptiness but I'm missing something" is replaced with Bieber's "I'm goin' down, down, down, down," before they perform a mash-up duet: Taylor sings "I think we're done, I'm not the only one" while Bieber sings "And I just can't believe my first love won't be around." At this moment, then, Isosine tracks the Slipknot lyrics atop Bieber in such a way that the mash-up becomes a discourse on innocent teenage love, from multiple perspectives, including that of nu-metal. The link promptly becomes farcical, when Bieber's featured rapper Ludacris enters the mash-up with his own meek, laidback reminiscence of young love: "When I was 13, I had my first love / There was nobody that compared to my baby, and nobody came between us who could ever come above / She had me going crazy, oh I was starstruck / She woke me up daily, don't need no Starbucks." While it is difficult to grasp the meaning of Slipknot's lyrics to "Psychosocial" (some have suggested that the track is about the Iraq war, others that it is about social decay or religious and anti-religious extremity),[350] it is clearly not about teenage heartache, and Corey Taylor would *never* start singing about Starbucks. Yet here he is, the mash-up implies, and Starbucks just went by.

When Taylor's vocal is introduced, the clips from "Baby" are replaced by clips from Slipknot's "Psychosocial" video, which, in contrast to the music by Bieber, reflects the dark message of the lyrics. Slipknot is shown performing their music while surrounded by burning flames, with a white wooden building in the background. Given the tropes of the metal genre, this scene might evoke the burning

[349] There are two versions of the "Psychosocial" video, one of which excludes the "limits of the Dead" lines of the album version. In the mash-up, these lines are also missing.
[350] Lovell, 2009.

of churches (though the white building does not have a steeple and the flames are well in front of it), confirming our stereotypical notions about metal. The flames might also evoke a straightforward doomsday scenario, in which Slipknot is headed for hell to face eternal punishment; band member Joey Jordison wears a crown of thorns here, which appears to support this association to the day of the Last Judgement. Moreover, in the middle of the video, there appears a nine-pointed star (a "nonagram") of flare torches that, according to Slipknot, symbolizes the unity of the band's original members,[351] but it might also evoke a pentagram, supporting the stereotype of the metal genre in general as sinful and satanic. Whether these anti-Christian allegories are intended as such or not, they set up yet another contrast to Bieber's video, and also to Bieber as a person—he calls himself a conservative Christian and ends each of his concerts by saying "God bless you" or "God loves you."[352]

Despite the cultural, ideological, and music-stylistic incongruity of these two tracks, the tracks manage to mingle into a coherent musical amalgam. The verse, in which Taylor performs in a monotone, is obviously easier to line up with Bieber's music than the chorus, because it does not require tonal synchronization between the melody and the chord progression (although structural elements such as tempo, time signature, rhythmic subdivisions, and breaks must be aligned regardless). In the chorus, Taylor ceases his guttural shouting and instead sings a rather memorable melody, which is, by the standards of some metal loyalists, already a traitorous move, even in the context of Slipknot's instrumentation. In the context of Isosine's mash-up, needless to say, it becomes downright embarrassing, as Taylor's catchy melody soars above the extremely quantified and predictable music of Justin Bieber.

The harmonic outline of the chorus of "Baby" is C-Am-F-G (I-VI-IV-V), a formula used in multiple pop songs. What makes the melody of "Psychosocial" and the chords of "Baby" fit so well harmonically is that the music of "Psychosocial," which is pitched up from G-minor to A-minor, appears in the relative minor key to "Baby," meaning that the two tracks then share their tonal language. Taylor's originally minor-key melody becomes a major-key melody in the mash-up, because the chords supporting the melody are replaced (a fifth in the original Slipknot melody becomes a major third in the mash-up version and the minor third becomes the tonic center). See figure 7 for an illustration of how the harmonic accompaniment of

[351] See www.slipknot-metal.com/main.php?sk=nonagram (27.20.12).
[352] Falsani, 2011: 131.

Taylor's vocal melody is changed in the mash-up. This new tonality, particularly when rendered by the rich, trancelike synthesizer strings of "Baby" as they arpeggiate the tonic chord in quarter notes, lightens up Taylor's melody while subverting his lyrical message.

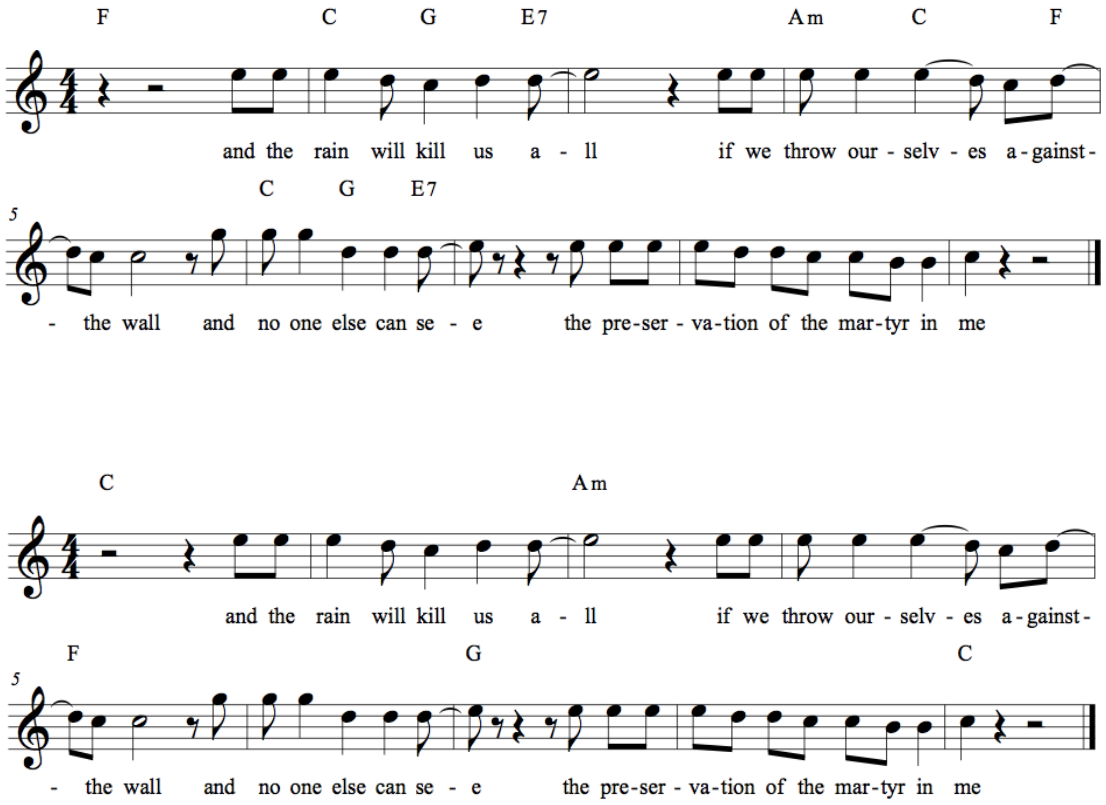

Figure 7: The first transcription illustrates the harmonies of the vocal line in Slipknot's "Psychosocial" (here transposed from G-minor to A-minor, as is done in the mash-up); the second transcription illustrates how the harmonies of the same vocal line, still performed by Slipknot's Corey Taylor, have in Isosine's "Psychosocial Baby" been replaced by the harmonies of Bieber's "Baby."

The manifestly virtual band of "Justin Bieber featuring Slipknot" comes across, first of all, as very funny because these artists are such "unlikely bedfellows," to borrow a phrase from Nick Prior,[353] and yet the mash-up suggests that these presumably incompatible tracks may actually have something in common. "Psychosocial Baby" demonstrates that the construction of identity is both founded on

[353] Prior, 2009: 89.

and strengthened by an antagonist or "other;" the mash-up of incongruent samples emphasizes the stereotypes inherent to both, because their differences are highlighted by their immediate juxtaposition.[354] Of course, given the accompanying musical *congruity*, the mash-up also makes us question those stereotypes; "Psychosocial Baby" might even suggest to some listeners that Slipknot and Justin Bieber are *not* so different as they had assumed. One reason for this is that mash-ups, in their very superimposition of samples, reveal previously unnoticed aspects of the music, and attendant social conventions are thus challenged as well as confirmed.

In general, it is striking how many listeners react with smiles or even laughter when hearing a new mash-up for the first time. The reason for this is, as Blaise Pascal once pointed out, that "nothing produces laughter more than a surprising disproportion between that which one expects and that which one sees."[355] By emphasizing both the expected differences and the unexpected similarities between the mashed sources, the mash-up does not necessarily satirize one or the other but instead criticizes or pokes fun at the stigmatization of both from (in the case of "Psychosocial Baby") opposite ends of the music spectrum. If we expect Justin Bieber and Slipknot to have little in common, the mash-up presents a successful virtual collaboration between them both *despite* and *because of* the very distinct matrices of associations that are integrated in the mash-up. "Psychosocial Baby" manages both to preserve its samples' differences *and* undermine them in favor of a newly coherent whole.

Consumption as Mode of Production

Borrowing Hutcheon's descriptions of various forms of media adaptations (that is, media incarnations or remediation), we might characterize mash-ups as conducting an "ongoing dialogue with the past" that "creates the doubled pleasure of the palimpsest: more than one text is experienced—and knowingly so."[356] When we listen to mash-

[354] The fact that the construction of meaning or identity depends on difference and thus is relational has influentially occupied several poststructuralists, including Jacques Derrida, who states, "Language, or any code, any system of referral in general, is constituted 'historically' as a weave of differences" (Derrida, 1982: 12). According to Gerhard Falk, the construction of identity is also related to our tendency to stigmatize: "All societies will always stigmatize some conditions and some behaviors because doing so provides for group solidarity by delineating 'outsiders' from 'insiders'" (Falk, 2001: 13).

[355] Quoted in Morreall, 1987: 130. Arthur Schopenhauer and Immanuel Kant were among the first to explain humor by pointing to incongruity or to the violation of our perceptual patterns that results in the understanding of something as odd or unusual (ibid.).

[356] Hutcheon, 2006: 116.

ups, we experience an oscillation between the new context of the sampled music and the samples' original contexts, and it is this ambiguity or double meaning of such heterogeneous halves forming a compelling whole that supplies the exciting friction and irony within the mash-up aesthetic. Like Hutcheon's descriptions of adaptations and irony, the mash-up is "intensely context- and discourse-dependent,"[357] and, the mash-up meaning operates in the space between what is "said" (what we hear) and what is "(plural) unsaid" (what we know)—a space in which both the "said" and the "unsaid" depend upon the other in order to generate meaning.[358]

A large part of the mash-up's meaning, thus, derives from the listener's understanding of it as a mash-up—that is, as a calculated collision of disparate sources. This understanding requires that the listener recognize the technological operations that have taken place: the mash-up must be understood as a technological juxtaposition of technologically extracted (sampled) sound sequences from existing recordings. Moreover, the listener must recognize the samples' sources. Of course, mash-ups can be appreciated even if the sources are not recognized, thanks to, for example, the artistry or intricacy of the musical dialogue (and general congruence) between the juxtaposed tracks. The point is that if the listener does not recognize the sources, or is unaware that the music in question represents a juxtaposition of samples, it will not be recognized *as a mash-up* but instead as something else.

The importance of big quotation marks to the mash-up aesthetics can be illustrated by the commercial reuse (or cover) of Girls on Top's "We Don't Give a Damn About Our Friends," a mash-up that combined the electro-pop hit "Are 'Friends' Electric" (1979) by Tubeway Army with the vocal track from the American R&B artist Adina Howard's 1995 debut single "Freak Like Me." The mash-up initially circulated as an illegal bootleg in 2000 but reappeared in 2002 when Universal Records allowed the English pop group Sugababes to release a legal version of it. In this case, the Sugababes actually covered the vocal by Adina Howard, and the instrumental by Tubeway Army was re-recorded and given a modern shaping that is stripped of the sci-fi trademarks of the 1980s. The mash-up-inspired pop song gave the Sugababes their first number-one single in the UK. Without the ironic incongruity between the music of Adina Howard and Tubeway Army and their profoundly divergent contextual connotations (and given that the band's fan base is

[357] Hutcheon, 2000: xiv.
[358] Hutcheon, 1994: 19, 58.

largely teenagers who might not be familiar with the covered sources), however, the irony and import of the original mash-up was almost certainly lost. If the producer of such cover versions of mash-ups does not openly acknowledge the sources—that is, if the mash-up lacks quotation marks—the incongruity is likely lost, and it is therefore not accurate to identify such a "reinterpretation of a reinterpretation" as itself a mash-up.[359]

Mash-up producers seem to assume that listeners are well acquainted with a wide range of musical styles and genres, but they generally avoid esotericism. While there will always be listeners who feel excluded regardless, mash-up producers generally trade obscurity for listeners' accessibility to the material, in order to enhance the appeal of their work and broaden their audience base. While the use of contemporary sources might limit the longevity of the mash-up (unless the music manages to survive the passage of time), it nevertheless "offers the *possibility* of greater consumer participation,"[360] as Serazio states. Isosine, of course, has selected among the most recognizable sources possible. Slipknot found instant success with their self-titled debut album in 1999, and their popularity has only increased since. They have been nominated for seven Grammy awards, including "Best Metal Performance" for "Psychosocial" in 2009. "Psychosocial" was the second single released from the 2008 album *All Hope Is Gone*, which debuted in the top spot of the Billboard 200 chart (a ranking of the highest-selling albums in the United States) and topped several other album charts around the world.[361] On YouTube, the music video of "Psychosocial" passed forty-eight million views as of this writing in 2012, and the track appeared in Lexi Alexander's action film *Punisher: War Zone* (2008). If possible, Justin Bieber's success as a teen pop phenomenon is even more comprehensive. To date, he has over nineteen million Twitter followers, and the music video of "Baby" has surpassed 700 million views, which is the most in YouTube history.[362] *My World 2.0*—which featured "Baby," one of Bieber's biggest hits—was certified platinum (selling over one million units) in the United States and

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[359] See Brøvig-Hanssen and Harkins, 2012: 98, for a further discussion of the relationship between these two versions.
[360] Serazio, 2008: 85. Emphasis in the original.
[361] For an overview of the different chart positions (with references), see en.wikipedia.org/wiki/All_Hope_Is_Gone#cite_note-39 (05.20.2012).
[362] In 2011, the *Guinness Book of World Records* indicated that the music video of "Baby" had officially become the most-watched video on the entire Internet with 575,118,703 views (Falsani, 2011: 204).

topped the sales charts in several countries, including the United States, United Kingdom, Canada, Australia, Japan, and France. According to the sales tracking system Nielsen SoundScan, Bieber has now sold over eight million albums,[363] which certainly verifies his commercial success. The media has even referred to the mayhem generated by Bieber fans as "Biebermania," alluding to the term "Beatlemania" that was introduced in the 1960s to describe the fan frenzy toward the Beatles (to say nothing of the popular saying "Bieber fever").[364] By choosing to blend artists with such cultural and media renown, Isosine guarantees a responsive (if not necessarily receptive) audience for his electro-quotations.

In addition to choosing samples from popular or classic recordings, mash-up producers usually edit them only subtly to make it easier for listeners to recognize them, which is how Isosine treated the samples of "Psychosocial Baby," as discussed earlier in this chapter. It is, however, not always the music itself that supplies the "quotation marks" that in turn draw the listener's attention to the mash-up concept; other indicators might be the contextual framing of the music or its accompanying features, such as its title, album cover illustration, music video, and so on—what Gerald Genette would call its "paratextuality."[365] For instance, the cut-up style of the mentioned mash-up album by Danger Mouse, *The Grey Album* (which combines the Beatles' *The White Album* and the a capella tracks from Jay-Z's *The Black Album*), achieves musical congruity between the mashed tracks but challenges our ability to recognize the album as a mash-up as such. Whereas many of the Beatles samples last several seconds, others are chopped into such small fragments that they are not easy to recognize. Listeners might therefore hear this music as samples inserted into an independent hip-hop production rather than equal parts of a two-group mash-up; the mash-ups might even be mistaken for Jay-Z remixes. The incongruity between the mashed tracks would likely have been lost were it not for the contextual/extramusical emphasis on the fact that the samples were derived almost exclusively from the music of Jay-Z and the Beatles. Downhill Battle's online demonstration "Grey Tuesday" promoted *The Grey Album* as a mash-up album, and in interviews Danger Mouse himself stressed this fact. The producer also posted artwork by the now-famous

[363] See www.billboard.com/#/news/justin-bieber-s-boyfriend-bound-for-big-1006589752.story?utm_source=most_recent (05.20.12).
[364] Falsani, 2011: 92.
[365] See Genette, 1982: 3.

illustrator Justin Hampton on his website, featuring a grey background added to a constructed group picture of a gold-chained Jay-Z with members of the Beatles to either side. *The Grey Video* (2004), a promotional video for the mash-up track "Encore," made the point again via the Internet that the mash-up, not hip-hop, governs the sample use in this case, and this video has been seen by millions (despite its introductory warning text that it is "not meant to be used for commercial purposes").[366] In some instances, then, it is the social and promotional context that encourages us to hear a given track as different from other forms of sample-based music—that is, that makes us hear a mash-up as such.

Because the experience of a mash-up *as a mash-up* requires that the mashed samples and their original contexts and stigmatization are recognized, the mash-up only becomes such via the (aural) "gaze" of the listener—it only exists in relation to the listener's previous understanding and knowledge. While meaning making in music always happens in the communicative space between the music and the listener, mash-ups require both an interpretation of the music that is presented and an interpretation of what is *not* presented; the aesthetic of the mash-up relies upon the listener's ability to fill in the blanks in his or her imagination. In this sense, then, the consumer becomes the mash-up's co-producer, in a more acute sense than the usual.

How, then, do we determine the actual "author" of "Psychosocial Baby"? Isosine, of course, acted as the curator of the samples and conceived of the mash-up itself. But because the composition is wrought of "readymades"—of already existing music—its authorship must be extended to Justin Bieber and Slipknot as well. And then there is the listener, without whose intervention the mash-up is no more than a track alone. Here we are witnessing a blurring of the boundary between producer and consumer on several levels. In the act of mashing the music of Justin Bieber and Slipknot, Isosine goes from being a consumer of "Psychosocial" and "Baby" to becoming the producer of "Psychosocial Baby." Along the way, interestingly, Bieber and Slipknot go from being the producers of their own individual music to becoming consumers of this (now shared) altered version of their music. "Everyday" listeners are at once consumers and producers of the mash-up: they produce its doubled meanings from what they consume and what they know. This authorial polyphony obviously questions traditional notions of authorship (and, by extension, of

[366] See Brøvig-Hanssen and Harkins, 2012, for an analysis of *The Grey Album* and *The Grey Video*.

intellectual property), as the figure of the author has either splintered into a collective or ceased to exist altogether. As Nicolas Bourriaud points out in *Postproduction: Culture as Screenplay; How Art Reprograms the World* (2005), the musical practice of sampling breaks apart the author in a very concrete way that goes beyond Roland Barthes's theoretical deconstruction ("the death of the Author").[367] Similarly, Julia Kristeva's objection to the notion of the *autonomous* work as well as the search for meaning as something inherent in the text is actualized very concretely in the mash-up, because in order to perceive the mash-up as a mash-up, the listener must negotiate references to outside texts all along. In the mash-up, Kristeva's notion of intertextuality is manifested in the web of references that is realized both within and among all "texts," but it is also manifested as the actual presence of one text within another.[368]

Instead of claiming to be creative, original, and virtuous in the traditional sense of the terms (creating something from scratch through talent and manual dexterity), mash-up producers tend to characterize their role as mainly curatorial, although the art of mashing requires certain technical skills as well. However, the act of selecting and extracting samples, of inhabiting and appropriating them, of decontextualizing and recontextualizing them, is arguably a legitimate mode of artistic production and creation involving both a creative and an interpretive act of appropriation.[369] For instance, we experience "Psychosocial Baby" as something much more than a random set of replications. The repeated material is changed not in the sense that the "text" has been altered but in the sense that contexts have been switched out, banged together, both engaged and abandoned. Bourriaud expresses the existential quandary

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[367] Bourriaud, 2005: 43. Roland Barthes famously stated that "the birth of the reader must be at the cost of the death of the Author" (Barthes, 1977: 148).

[368] The practice of sampling might, in fact, better be described by Gerald Genette's adaptation of Kristeva's term *intertextualité* than by Kristeva's theories themselves, which she developed in her reworking of Ferdinand de Saussure's semiotics and Mikhail Bakhtin's dialogism (see Kristeva, 1980; first published in 1969). In Genette's *Palimpsestes: la literature au second degreé* (1997; first published in 1982), what Kristeva implies by "intertextuality"—multiple references to other texts, deliberate or unconscious, hidden or exposed—he instead calls "transtextuality." He then places "intertextuality" as a subcategory of "transtextuality" to refer to the *actual* presence of one text within another (Genette, 1997: 1–2). Serge Lacasse demonstrates how Genette's subcategories of "transtextuality," in particular "intertextuality" and "hypertextuality," can serve as useful concepts in describing various forms of music recycling in recorded popular music (see Lacasse, 2007).

[369] As Paul Théberge points out, musicians' "entire approach to music-making has been transformed so that consumption—the exercise of taste and choice—has become implicated in their musical practices at the most fundamental level" (Thebérge, 1997: 200).

of the contemporary artist in any medium in a way that sheds light on the mash-up producer as well: "The artistic question is no longer: 'what can we make that is new?' but 'how can we make do with what we have?' In other words, how can we produce singularity and meaning from this chaotic mass of objects, names, and references that constitutes our daily life?"[370] In contrast to the "autonomous work," part of the aesthetic of the mash-up lies in the acknowledgment and recognition of the intertextual play and signification that is inscribed within it and that converges to form a new meaning.

Because contemporary art "tends to abolish the ownership of forms, or in any case to shake up the old jurisprudence," Bourriaud asks whether we are "heading toward a culture that would do away with copyright in favor of a policy allowing free access to works."[371] If intellectual property is framed as a means of profit alone, interestingly, mash-ups need not represent a financial threat to the originators of their samples; on the contrary, mash-ups offer the originators a potential economic benefit, because they invite the listener to rehear the original music in order to derive the most benefit from the new version. If intellectual property is framed as "the moral right of the author to be attributed as the author of a work,"[372] mash-ups do not in fact challenge this right; instead, the mash-up aesthetic relies upon the listener's recognition of *who the author is*. The intellectual property that mash-ups *might* challenge is, however, "the moral right of the author to object to derogatory treatment of a work which is prejudicial to their honour and reputation."[373]

Not surprisingly, several journalists and academic scholars have found mash-ups to represent an interesting case study regarding the issues of intellectual property and copyright infringement.[374] Philip A. Gunderson even celebrates mash-ups as a revolutionary art form and uses the theories of Jean Baudrillard to argue that mash-up producers like Danger Mouse may actually be seen as cultural prophets: "They preach a new economics of simulacra, the unrestricted sharing of digital copies without originals"[375] (this despite the fact that Danger Mouse made it clear in an interview about *The Grey Album* that "it was not my intention to break copyright laws. It was

[370] Bourriaud, 2005: 8.
[371] Bourriaud, 2005: 17.
[372] Rimmer, 2005: 48.
[373] Rimmer, 2005: 48.
[374] See, for example Ayers, 2006; Bollier and Racine, 2005; Gunderson, 2004; Gunkel, 2012; McGranahan, 2010; McLeod, 2005a; Rimmer, 2005; and Sinnreich, 2010.
[375] Gunderson, 2004.

my intent to make an art project").[376] While mash-up music offers a productive and interesting point of departure for the discussion of the relation—more precisely, the *gap*—between established moral and economic rights of intellectual property (which uphold a strict line between consumption and production) and new forms of music recycling (which blur this distinction), this is beyond the scope of the present thesis. Instead, given its focus on the mash-up's aesthetics rather than the mash-up's political consequences, this chapter might contribute to balancing the narrative that has been constructed in the academic literature on this art form. Whatever the longterm political consequences of the contemporary practices of recycling, it is certain that within our participating and configurable cyberculture,[377] no musicians or producers have the absolutely final say about their music. As Dick Hebdige observes in his study of Caribbean music, "No one's version is treated as Holy Writ."[378]

Conclusion

A mash-up producer who uses the pseudonym Tony Montana (Al Pacino's character in the 1983 film *Scarface*) argues that "a good mash up/bootleg is a culture clash . . . 2 styles that shouldnt [*sic*] work together but do."[379] The experience of incongruity in mash-ups derives not only from the fact that two (or more) existing tracks are combined and thereby removed from their original artist and genre contexts but also from the fact that the mash-up tends to upend our social conventions of stereotypes. The mash-up producer's motivation behind his/her engagement in mashing disparate sources into a coherent whole might constitute a benevolent attempt to amuse or a more pointed attempt to motivate or comment politically. Regarding "Psychosocial Baby," Isosine states: "Half of it is a message that addresses the apparent social stigma in music culture. The other half is just me trying to have fun and poke fun."[380] More than simply commenting on the stigmatization of musical genres and categories, mash-ups have also been subsumed into larger social or cultural critiques. For instance, some critics, particularly in the United States,[381] have interpreted mash-ups that combine black and white artists (such as Danger Mouse's *The Grey Album* or Evolution Control Committee's *The Whipped Cream Mixes*) as implicit critiques of

[376] Quoted in Rimmer, 2005: 40.
[377] I here borrow the notion of a "configurable culture" from Sinnreich, 2010.
[378] Hebdige, 1987: 14.
[379] Quoted in Sinnreich, 2010: 165.
[380] S. Nguyen, personal communication, April 2012.
[381] See Taylor, 2003.

racial essentialism and the segregated marketing of the music and media industries. An alternative interpretation is that such mash-ups contribute to bridging the gulf between racial categories and support musical miscegenation. Mash-ups have also been cast either as transcending the high/low dichotomy of the cultural popular music hierarchy or as bridging these social chasms.[382]

Mash-ups have also sometimes been interpreted as satirizing the music or artists of one of the mashed sources while favoring the other. While members of the copyright activist organization Downhill Battle regard *The Grey Album* by Danger Mouse as "one of the most 'respectful' and undeniably positive examples of sampling; it honors both the Beatles and Jay-Z,"[383] other listeners feel differently: "Jay-Z's rap is not worthy of the Beatles' backing music (even remixed). In fact, it creates the opposite effect: You get the feeling that one of the greatest records of all time by one of the greatest groups of all time has just had mud ladled all over it."[384] Along these lines, several Slipknot fans have expressed their profound distaste for "Psychosocial Baby" (perhaps because they are interpret it as a suggestion that Slipknot, with "Psychosocial," has sold out). Slipknot vocalist Corey Taylor, on the other hand, salutes it:

> Ah, "Psychosocial Baby," that is fucking hilarious! . . . I love it when anybody takes the piss out of me because you . . . you take yourself too seriously and that's when you get knocked out, if you don't laugh at yourself. I thought it was great. I was like, "This is fucking beautiful!" The way it was put together . . . There are so many kids that are pissed off about it that it makes me laugh. You know, this is fucking amazing. You either get it or you don't.[385]

In any case, the doubled meaning of the mash-up underpins all such readings of this music as social or aesthetic commenting, as sarcasm or mockery, as a racial statement, as a vote for or against an existing hierarchy of taste, as a bridging or subverting of opposing subcultures, or as a more innocent and benevolent form of irony. All of this meaning making happens in the listener's constant oscillation

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[382] See McLeod, 2005a: 84, and Brøvig-Hanssen and Harkins, 2012: 100.
[383] Shachtman, 2004.
[384] A critic quoted in Rimmer, 2005: 50.
[385] Corey Taylor, freely transcribed from www.youtube.com/watch?v=CPNBUSY2M-Q (12.16.12).

between the new and the original contexts of the sampled material, that is, in the space between the overtly articulated and the covertly implied.

After referring to a 2003 *Time* magazine article that featured a step-by-step guide to making a mash-up, Serazio concludes that the communally respected mash-up producer Freelance Hellraiser "may not have been such [a] genius after all."[386] Yet there is more to it, as mash-up producer Mysterious D points out: "Basically as a craft almost anyone can learn [it], and [*sic*] not anyone can really make a great mash-up."[387] Traditional musical parameters such as melody, harmony, or rhythm, of course, do not illuminate the complexity of the mash-up's aesthetics, which might result in a rash characterization of the music as unoriginal and uncreative. As mentioned in the introduction to this thesis, if we are to truly understand what triggers us when listening to music, we must sometimes look beyond those traditional parameters to the music's particular modes of technological mediation. In terms of mash-ups, we must also look to the contextual frames that the technological sampling sets up.

Bourriaud sees artistic mastery in our contemporary environment (in which music recycling, or what he calls "postproduction"—a new production of an existing recording—is the dominant art form) as a "matter of seizing all the codes of the culture, all the forms of everyday life, the works of the global patrimony, and making them function."[388] The art of mash-up music lies not in the creation of something entirely new or original in the traditional sense. Like other recycled art forms, its "newness" derives from its very collection and combination of something preexisting, in a way that makes it function anew. The mash-up producer seeks samples that fit together musically despite sources that are perceived to belong to discrete social categories. The production of mash-ups demands a particular kind of virtuosity, in terms of listening skills as well as a certain critical taste regarding the social and aesthetic conventions that exist within the given musical subcultures. Mash-ups evoke Hutcheon's description of postmodern parody: "Its two voices [in this case, the two juxtaposed samples, but also the said and the unsaid] neither merge nor cancel each other out; they work together, while remaining distinct in their defining difference."[389]

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[386] Serazio, 2008: 80.
[387] Sinnreich, 2010: 97.
[388] Bourriaud, 2005: 8.
[389] Hutcheon, 2000: xiv.

It is the experiential doubling of the music as *simultaneously* congruent and incongruent that produces the richness in meaning and the paradoxical effects of the successful mash-up.

Mash-up music draws attention to itself as a juxtaposition of samples, as a technological construct, as an act of opaque mediation: "What seems clear," Serazio argues, "is that technology plays a significant role in changing our relationship to the music text."[390] Mash-ups such as "Psychosocial Baby," as well as other forms of technological music recycling, contest the traditional notion of music as well as the traditional notions of creativity, originality, and authorship. Such music also gives prerecorded music, previously assumed to be the final product, an afterlife. As Serazio puts it, "A song, once thought to be a completed project upon delivery to the consumer, is now forever unfinished—putty in the hands of a potential Acid Pro alchemist."[391] If the ubiquity of digital recycling in popular music means, as Andrew Goodwin suggested in 1988,[392] that pop might eat itself, mash-ups move forward by reinventing the past, finding the new in the old and announcing it with both gusto and irony.

[390] Serazio, 2008: 85.
[391] Serazio, 2008: 84. ACID Pro is a DAW program by Sony Creative Software.
[392] I am here referring to Goodwin's article "Sample and Hold: Pop Music in the Age of Digital Reproduction," first published in 1988 but reappearing in 1990 in Simon Frith and Andrew Goodwin's anthology *On Record: Rock, Pop, and the Written Word* (London: Routledge).

Chapter 7

Popular Music in the Digital Era

The aim of this thesis was to elucidate how technological mediation in general, and digital mediation in particular, contributes to the aesthetics of popular music. I identified three further questions with which to undertake this task: (1) What are the signatures of digital mediation? (2) How has the aesthetic potential of digital mediation been explored in the making of popular music? (3) How do the digital signatures of mediation contribute to the meaning of the music?

In my introduction, I reviewed my notions of transparent and opaque mediation, with which I have tried to deconstruct the binary of mediated versus unmediated. What is generally perceived to be unmediated music, of course, is usually transparently (as opposed to opaquely) mediated music instead; there is, after all, very little popular music that is *completely* unmediated. My nuancing of this binary also emphasizes the fact that while a given act of mediation might stay the same, people's experience of it will vary according to time, place, and genre. Furthermore, the notions of transparent and opaque mediation signal alternative musical paradigms. In the former (transparent mediation), mediation is used to embellish what already is; in the latter (opaque mediation), the mediation's self-presentation is exploited in and of itself.

In chapter 2, I framed digital mediation in its historical context. In particular, I focused on how each recording era has, in different ways and to different extents, enabled manipulations of music's spatiotemporal features, thereby transforming the listener's understanding of recorded music from an indexical sign of a preexisting musical performance to a *representation* of a musical performance with no claim to any actual performance at all. I found it relevant to adapt R. Murray Schafer's notion of *schizophonia* (the splitting of sounds from their sources) to three musical eras: the mechanical, the magnetic, and the digital. I also described the three different recording paradigms that emerged from the respective opportunities offered by the technologies of the magnetic era: (1) the documentary paradigm, which insists that the music in question once took place as it consequently appears in the recording; (2) the

paradigm of ideal performances, which aims to present performances that theoretically could have happened but need not have—contrary to the documentary, devotees of the ideal performance paradigm will happily sacrifice veracity for perfection; and (3) the paradigm of opaquely fragmented performances, which is dedicated to exploring the aesthetic potential of opaque mediation within an understanding of music that accepts the possibility (indeed, the likelihood) of its spatiotemporal *disjuncture*. While these paradigms remained relatively distinct in the magnetic era of schizophonia, they have since mingled, thanks to changes in what constitutes a "live" performance in the first place.

The ensuing four chapters featured in-depth analyses of digitally mediated music by Kate Bush, Portishead, DJ Food, and Isosine. Here I explored in some detail a host of different mediation signatures, engaging in particular with the question of how their aesthetic potentials were explored in the music, and how they in turn contribute to the experience and meaning of the music.

I will begin the present chapter by revisiting the analytical chapters specifically in terms of the three research questions outlined above. I will then attempt a further characterization of the digital era of schizophonia by discussing in more detail what signatures of mediation actually are and how these signatures, or new sonic features, have been exploited. I will draw upon my findings in chapter 2 here as well. This will lead me to the issue of how this mediation is experienced, and particularly to the experiential tension that often arises in this context between our ecologically/historically informed ways of listening (which are constantly challenged by new musical forms) and the processes of naturalization that constantly act to change those ways (making those new musical forms historical, for example). Finally, I will speak to the significance of mediation in popular music, less in terms of its production and distribution than in terms of its very aesthetic. I will end by articulating some of the ways in which this inquiry contributes to the field of popular music studies in general.

A New Compositional Palette for Popular Music Making

The distinctive signatures of digital mediation contribute more than anything else to its effect upon the aesthetics of popular music. This thesis, which could not be exhaustive in this regard, focused upon the following signatures: the digital signal-processing effects of delay and reverb, the characteristic "digital" silence, the cut-and-

paste tool of digital sequencer programs, the digital "glitches" that sometimes accompany use of this virtual tool, and uniquely digital forms of music recycling. These signatures were explored via four case studies that represented important stages in the development of digital music devices and practices. They also explore the aesthetic potential of these signatures in interesting and compelling ways.

In chapter 3, I looked at the ways in which digital delay and reverb increased the music maker's options for fabricating musical spatiality, given their more complex but also more controllable design in relation to their analog predecessors. Because digital delay and reverb are created via various algorithms or mathematical formulas that alter the numerical values of the digitally recorded (sampled) sounds, they have a distinct "digital" character. Digital delay, as opposed to analog delay, does not automatically deteriorate in sound quality or reduce in volume, and digital reverb is completely "clean," in contrast to the metallic sound of the analog plate reverb (moreover, its reflections can be made more distinct than those naturally produced by actual spaces). These digital processing effects also gave the producer more control than ever before in terms of being able to alter any parameter with the turn of a knob or the push of a button, up to and including various manufactured presets. This general enhancement of performance and ease of design and use has allowed music makers to use these effects to mimic worldly spatial environments better than ever before. Crucially, it has also allowed them to *reinvent spatiality* altogether. In addition to generating spaces that are larger or smaller than life, then, one could also create a spatial environment that is completely different from life in other ways.

I exemplified the uniqueness of digital delay and reverb through an analysis of Kate Bush's "Get Out of My House," which is characterized by an almost unhinged exploitation of these processing effects. I was particularly interested in the fact that Bush and her co-producers deliberately used these effects to propose a spatiality premised not on the "real" world but on exclusively technological motivations including the delayed sonic clones of the guitar, the gated reverb of the drums, the reversed reverb of the vocal, and the spatial collage of the many vocals and instrumental sounds in juxtaposition. While some of Bush's otherworldly effects could have been produced with analog technology, they achieve unprecedented prominence here thanks to their digital origins and context, to the extent that they become, in short, signifiers of the digital.

On the one hand, then, surreal spatiality like that of "Get Out of My House" has now become relatively naturalized. On the other hand, people persist in meeting these sorts of spatialities not on their own terms but in the context of the real world in which they continue to live and accumulate experience. No matter how familiar we become with such musical spatiality, we continue to appreciate (or resent) the digital mediation that is at work there, which allows for an interesting experiential tension between conflicting impressions of the music as at once natural and surreal, and of the mediation as at once transparent and opaque.

I also looked at the ways in which the track's variety of digital spatialities might impact the listener's interpretation of the musical meaning of "Get Out of My House." Its many spatial environments both support the meanings already communicated by other musical aspects of the track and generate new meanings of their own. "Get Out of My House," then, is infinitely richer for the presence of its obviously surreal (and strategic) spatial staging, and we do not balk at this fact because we have heard these effects elsewhere, though never in such fraught juxtaposition.

In chapter 4, I first framed the characteristic silence of digital technology in terms of its radical departure from its predecessors' various noise byproducts. By fulfilling the cultural and historical quest for complete transparency or high fidelity to the sound source, it provided a new basis for comparison with older media that, rather perversely, inspired many people to embrace them because of (rather than in spite of) their noise. Not only did this type of noise become more "present" in the age of its absence, but it also became revitalized and revalued. What were once regarded as limitations of technology were now redeemed as desirable aesthetic qualities and, in turn, new compositional opportunities. These opportunities—which involved the exploration of pre-digital medium signatures through old equipment, obsolete recording techniques, or samples of pre-digital music—were embraced most enthusiastically in the 1990s, which in effect became a decade characterized by a lo-fi movement that crossed genres and styles.

I found, however, that instead of rejecting digital technology altogether, music makers that subscribed to this trend often tended toward various combinations and interminglings of old *and* new technology. Their music, while understood to be speaking to (and speaking in the voice of) the past, was in fact firmly situated in the present. A case in point is Portishead's "Strangers," which my analysis revealed to be characterized by its juxtaposition of sonic signatures of both previous and present

musical eras. For example, the medium noises in "Strangers" are disrupted by moments of utter digital silence, and this jarring contrast makes us encounter both the analog and the digital afresh. Further more, digital silence, which we are tempted to think of as "nothing"—as an absence of sound and, thus, an absence of meaning—is here vested with concrete musical import, in the sense that it is able to provide both aesthetic and emotional pleasure in the same way that older technologies (now) do. This, of course, proves that sounds' meanings and functions are discursively dependent—sounds are, in short, what we make of them.

Vinyl noise and other sounds associated with pre-digital technologies' "limitations" are today very common aesthetic effects in popular music productions. Yet even though we understand them to be conscious aesthetic choices rather than necessary technical limitations, our previous experiences and cultural associations continue to inform our experience of these tracks as acts of opaque mediation that signal a juxtaposition of different musical eras.

In chapter 5, I discussed how the virtual cut-and-paste tool of digital sequencer programs renewed and reinvigorated the experimental cut-and-paste approach by eliminating the extremely time-consuming process of physically splicing analog sound tapes. Through my analysis of DJ Food's "Break," I examined in detail how this form of technological mediation contributed to the sound and groove of the music, and ultimately to its meaning and aesthetic appeal. I also explored the novelty of this reinvented tool, whose digital applications would promptly overwhelm any physical cut-and-paste operation from the magnetic era of analog tape splicing. Moreover, the level of precision in digital cut-up operations—thanks to the ability to zoom in on the sounds and treat them at a micro level—is unprecedented. Like digital spatiality and digital silence, then, digital cut-ups augment the compositional palette of music makers, in terms of new sounds and new musical effects, and in so doing also augment the aesthetic preferences of music listeners.

In my discussion, I was particularly interested in how these sounds are reminiscent of digital malfunctions such as the stuttering sounds caused by a CD player that cannot read the information on a scratched disc or the hiccups and pauses caused by buffer underruns during a computer program's playback of audio files. While some pre-digital music makers explored the rhythmic and sonic complexity of glitches as well, the late 1990s saw a marked revival of the glitch in popular music production, first in electronic music but later in more mainstream music as well.

Because cut-ups and other glitch sounds are now rather common, they have lost most of their shock value, but, thanks to their profound associations with technological failure, they continue to draw attention to themselves as acts of opaque mediation. This consequently allows for their double experiential meaning: they both are and are not "part" of the music, and are at once desirable and undesirable as a consequence.

"Break" also seems like music within music, as if a "normal" or traditional layer is being interrupted or manipulated by a layer of cut-ups and glitches. Each layer's meaning and function relies upon the other as well. We would not experience these sounds as cut-ups, medium glitches, or signal dropouts if we were not aware that there was something to be glitched or missed; conversely, the glitches reinforce (or at least evoke) our association of "music" as such with a spatiotemporally coherent singular performance. Again we meet with the double meaning of "Break": this track both is and is not a traditional performance; its glitches both disturb and constitute its music. Cut-ups thus draw attention to both the recording/production medium's ability to transparently mediate a message *and* the medium's constant participation in that message.

In chapter 6, I explored the ways in which the digitalization of technology has facilitated the practice of music recycling and consequently propelled the montage aesthetic in popular music forward while giving it a new appearance. Though digital music recycling is most often associated with, and discussed in relation to, the sampler instrument, I focused instead upon how DAWs are used to perform the same operation. I then related this particular trend to the development and aesthetics of musical mash-ups, which became a distinct style at the turn of the twenty-first century, thanks to the development of digital sequencer programs, the decreasing price of powerful computers, the increasing availability of high-speed Internet connections, and the development of peer-to-peer networks and social networking services that simplified the sharing and distribution of musical files. By mashing two or more (often full-length) samples, mash-up music takes advantage of the uniquely digital abilities to quickly match the tempi and keys of different tracks by means of auto-detection and to alter tempo and key independent of one another, as well as to preserve the sound quality of the speed- or pitch-altered sounds. Mash-up producers also took advantage of the new capacities offered by the Internet, acquiring mashed sources by downloading files from the Internet's freely available and vaster-than-ever musical archive and in turn distributing their mash-ups via this arena as well (the

relatively uncontrollable nature of which allows them to bypass the laws of intellectual property).

After discussing mash-ups in its variety, I concluded that the mash-up aesthetic derives from two fundamental qualities of this music: a contextual or ideological incongruity between the mashed sources (provoking a feeling of subverted conventions) in tandem with a musical congruity or dialogue between the mashed tracks. I exemplified this aesthetic through an analysis of Isosine's "Psychosocial Baby," which blends "Psychosocial" by the (nu-)metal band Slipknot with "Baby" by the teenage-pop star Justin Bieber, sources likely chosen for their conformity to the above qualities of mash-up. "Psychosocial Baby" also demonstrated the way in which mash-up music usually encourages oversimplified assumptions about resolute categories and thus plays upon our tendency to stigmatize. In addition to emphasizing the expected differences between sources, that is, mash-ups also foreground unexpected *similarities*, even hinting that these presumed-to-be-incompatible tracks are not as different as we thought. It is the experiential oscillation between the samples' original and new contexts, and the experiential doubling of the music as *simultaneously* congruent and incongruent, that makes this music so interesting. The means of achieving this effect, of course, are utterly dependent on mediating technology, and moreover, on experiencing the mediation as *opaque*. For instance, understanding mash-up as mash-up demands that we recognize, in addition to the sampled sources and their (cultural ascribed) contexts, that the music itself is a juxtaposition of samples in the first place.

In contrast to any notion of an "autonomous work," then, part of the aesthetic of the mash-up derives from our acknowledgment and recognition of its intertextual play: the meaning of the music is located in the oscillating space between the overtly articulated and the covertly implied. Because the mash-up only exists as a mash-up if the listener recognizes it as such, that listener, I concluded, becomes a kind of co-producer of the mash-up. This blurs the boundary between producer and consumer on several levels, in that the mash-up "curator" or producer, the samples' originators, and the listener share responsibilities as consumers and producers at different points in the process. Consequently, the iconic figure of the "author" either disappears altogether or breaks apart into a polyphony of producers, in turn contesting traditional notions of authorship and intellectual property as well as creativity, originality, and musical skill. I nevertheless decided that the mash-up's musical act of reinventing the past, in

terms of finding the new in the old by means of the selection and juxtaposition of samples, involves both a creative *and* an interpretive act of appropriation along with considerable cultural insight and the musical skill to share it all effectively with the listener. As is the case with my other musical examples in this thesis, traditional analytical parameters such as melody, harmony, and rhythm do not get at the actual complexity of the mash-up aesthetic. Mash-up music acknowledges itself as a juxtaposition of samples, as a technological construct, as opaque mediation, and as a very concrete intertextual play, and it must be approached in these terms as well.

With these various conclusions in mind, I will now sum up my findings regarding how digital signatures of mediation, and the aestheticization of these signatures, have added to the music maker's compositional palette.

The New Era of Schizophonia

As I emphasized in my introductory chapters, the signatures studied in this thesis are not all of those that exist, but they nevertheless serve to demonstrate that the digitalization of technology has affected popular music aesthetics in important ways. Unlike digital silence, the processing effects of delay and reverb, the editing tool of cut-and-paste, and the compositional technique of music recycling are not new but rather have been reinvented. The fact that the digital versions of these tools and compositional techniques are all based on fundamentally different technical principles has resulted in significant alterations to their functions, applications, and sonic results, as discussed above.

Perhaps most obviously, the digitalization of technology has introduced sounds and effects that are now giveaways to its presence, such as complete operating silence, sonic clones (as in delayed sounds), the sounds of digital glitches, and new forms of sonic spatiality. In addition to the musical changes brought about by qualities that are *unique* to the digital medium, other sonic features have resulted from the ways in which digital technology has reinvented analog tools and techniques. The digitalization of sampling and cut-and-paste techniques, for example, brought about a quantitative change in their impact upon popular music production; while certain musical features are not unique (such as the ability to cut and paste music), the scale with which these features are applied is almost unthinkable via analog technology. In this regard, it is very pertinent to ask whether a quantitative change at some point flips over to become a qualitative signature. The fact that these once-analog features are so

much more present in digitally produced music means that they must now be regarded as signatures of digital mediation in particular.

Digital mediation's qualitative and quantitative changes have affected popular music aesthetics tremendously in terms of their contributions to entirely new musical effects. As emphasized in chapter 2 and demonstrated elsewhere, the digitalization of technology has, among other things, encouraged an approach to music composition that privileges spatiotemporal experimentation and a sonic acknowledgment of the spatiotemporal disjuncture of the sounds.

In chapter 2, I argued that the primary lasting impact of the phonograph was that it split sounds from their spatial and temporal origins, thus occasioning a cultural shift toward schizophonia. Though music makers of the mechanical era frequently experimented with musical overdubbing, a lack of editing possibilities largely restricted the phonographic recording medium to representing music as a spatiotemporally coherent performance; it did not challenge the traditional notion of musical form. The primary lasting impact of its successor, the magnetic tape recorder, was that it *split the musical bundle of sounds*—which were already split from their sources, of course—disrupting their shared spatiotemporal frame by allowing for several takes that could be treated independently. Because the magnetic tape recorder thus accommodated music consisting of a juxtaposition of musical material from different times and spaces, it inaugurated a second era of schizophonia. With its enhanced editing abilities, including cutting and splicing, the magnetic tape recorder suggested and even promoted experimentation with music's spatiotemporal structure. Lastly, though the digital recording/production medium did not split the sounds any further from their sources or one another, it has made this act of splitting both more frequent and more profound, even to the extent of inaugurating yet a third era of schizophonia.

Along with its enhanced capacities for splitting and manipulating sounds, digital technology also allows the music maker to undo what is done—it is not, in and of itself, destructive to the materials upon which it acts. Throughout the history of popular music, music makers have explored unconventional recording techniques, alternative and novel ways of using music technological equipment, and radical means of manipulating sounds that have resulted in an alteration of a sound's timbral

or sonic qualities.[393] However, when it comes to the spatiotemporal disjuncture of sounds, the digital era simply has more (and more effective) ways to do things. If, as Albin J. Zak III suggests, timbre has traditionally been "the parameter that allows for the greatest range of experimentation in rock music,"[394] we are witnessing, alongside music that continues to conform to a spatiotemporally coherent form, an ever-expanding economy of scale in music experimentation when it comes to manipulating that form.

The music analyzed in this thesis exemplifies four leading digital means of exploiting the spatiotemporal disjuncture of sounds. In chapter 3, I discussed music as a sonic montage of sounds that seem to belong to different spaces or sonic environments; here, the production represents a purposefully *spatial* schizophonia that foregrounds the act of splitting the sounds from their original spatial settings. In chapter 4, I discussed how digital silence encourages music makers to revisit sounds originally belonging to the past, split them from their sources, and insert them in a new musical context; the schizophonic musical result simultaneously evokes different eras thanks to the characteristic material signatures of different mediums. In chapter 5, I discussed music that bears audible traces of being chopped up and manipulated by cut-and-paste operations, often simulating the distortion attendant upon technological malfunction as well, to create a schizophonic distortion of traditional temporal coherence. Contemporary manifestations of music recycling, discussed in chapter 6, consist of a sonic montage of different recordings, and thus of different times and spaces, as an example of perhaps the ultimate form of schizophonia.

Despite all of this experimentation and change, the spatiotemporally coherent form remains central to contemporary popular music aesthetics, as was also emphasized in chapter 2 (see, for example, my description of different recording paradigms here). This demonstrates that the perceived affordances of digital technology differ from consumer to consumer and from context to context, and that they will not always serve radical ends. Obviously, then, the increase in musical

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[393] Think, for instance, of the crooning style developed in 1930 or so and later associated with singers such as Rudy Vallee, Bing Crosby, Perry Como, and Frank Sinatra, which involved an experimental, even radical use of the microphone in live performance; or Pete Townshend's extensive feedback manipulation in his guitar solo on the Who's "Anyway, Anyhow, Anywhere" from 1965; or Jimi Hendrix's heavily distorted guitar sound on "Purple Haze" or stereo phasing effects on "Bold as Love," both from 1967; or the attention-grabbing vocoder vocals of Kraftwerk's "Autobahn" from 1974 or "Trans-Europe Express" from 1977.

[394] Zak, 2001: 63.

manifestations of spatiotemporal disjuncture cannot be explained by the advent of digital technology alone but requires a certain mindset as well—one that is perhaps more common now but by no means ubiquitous.

My notion of a third era of schizophonia, then, is not meant to imply some new form of "progress" in music making, which continues to thrive as much on tradition as it does on innovation. Instead, this new era merely represents an example of how aesthetic and technological changes should always be understood in relation to one another. However, the fact that digitally converted sounds can be treated very differently than analog sounds has certainly informed, and in some ways transformed, the ways we compose and produce music, the ways we listen to it, and, ultimately, the ways we conceptualize it.

Historical Listening Constraints and the Tuning of the Ear

The fact that spatiotemporally fragmented music has only existed for a short while relative to the span of music's history has certain perceptual consequences: we still compare, consciously or unconsciously, the new music we hear with our historically and culturally deep-rooted notion of music as a spatiotemporally coherent form. In keeping with this, we also compare mediated sounds to unmediated sounds, so that our impression of music as cut-up, glitched, or over-processed derives directly from the alternative: technologically unmediated music, or music that is constrained to unfold in a unified space and time. As Linda Hutcheon puts it, discontinuity is revealed at the heart of continuity,[395] and, we might add, mediated sounds are revealed at the heart of unmediatedness.[396]

However, in addition to our "historical" listening constraints, another force affects our perception: the tuning of our ears. When a new sound is introduced through the musical recording as the result of a new musical tool or technique, it might initially draw considerable attention to itself—this is because we experience it as opaque and therefore possibly as weird, surreal, supernatural, or uncanny. Yet new musical expressions often become naturalized, so that the new sound will one day be the norm against which new sonic environments are measured. Many longstanding

[395] Hutcheon, 1988: 11. With this phrase, she is, of course, echoing Derrida's notion that meaning can only be constructed from our understanding of differences (see, for example, Derrida, 1982: 21).

[396] As emphasized in chapter 2, I do not mean to imply here that we inevitably compare recorded music to a live performance, if for no other reason than the fact that live music today might be just as manipulated as recorded music.

fabricated sounds on popular music recordings have become so naturalized that they barely evoke any sense of uncanniness whatsoever anymore. The elasticity as to what is regarded as "natural," in other words, is enormous, thanks to the tuning of our ears. Writing in the late 1930s, Walter Benjamin already observed that what is "standard" in a technologically mediated reality may in fact be so normalized that when a mimetic representation of the unmediated reality behind it appears in this mediated reality, it may be experienced in turn as "unstandard," or even as mediated anew:

> That is to say, in the [film] studio the mechanical equipment has penetrated so deeply into reality that its pure aspect freed from the foreign substance of equipment is the result of a special procedure . . . The equipment-free aspect of reality here has become the height of artifice; the sight of immediate reality has become an orchid in the land of technology.[397]

For example, the voice in today's popular music productions is generally highly mediated, in terms of being compressed, equalized, reverbed, and so on. This means that when we hear a voice, either on a musical recording or at a concert, that feels different from this compressed and voluminous high-definition sound, we want to blame somebody (usually the sound engineer). The unmediated voice, today, is that orchid in an otherwise utterly mediated musical environment.

In 1977, R. Murray Schafer noticed that the soundscape of the radio, whose sonic juxtaposition of different shows is indeed "unnatural" relative to technologically unmediated sonic environments, has been rendered natural thanks to the influence of other electroacoustic devices in company with it. As a result, he reasons, "The radio has actually become the bird-song of modern life, the 'natural soundscape.'"[398] Surely, then, the mediated world can be experienced as just as real or natural as any unmediated environments. Yet, our awareness of alternative contexts, and of what rules apply within them, remains very strong. For example, though a technologically filtered voice may now be naturalized in a *musical* context, it would be uncanny indeed if the person next to us suddenly started speaking in that sort of voice. James J. Gibson's realization that the same environment can afford different things to people in different contexts (see chapters 1 and 3) may also shed light on how we sometimes

[397] Benjamin, 1968: 233; the essay was first published in 1936.
[398] Schafer, 1977: 93.

experience the same sound as both surreal and naturalized[399]—this depends, in other words, on what context we compare it to. The sonic montages of spatial environments in Kate Bush's "Get Out of My House," the evocations of different aural eras in Portishead's "Strangers," the cut-up music of DJ Food's "Break," and the manifestly virtual collaboration between Slipknot and Justin Bieber in Isosine's "Psychosocial Baby" only come across as manipulated, surreal, or uncanny in comparison to a spatiotemporally coherent performance. Taken completely on their own, or in the company of other tracks from the same music maker or genre, these manipulated musical expressions might well be experienced as perfectly appropriate, and even normal and "natural" in their own ways.

The competition between our historical listening constraints and the tuning of our ears also explains why we might experience digital sound signatures as balanced on the border between the music's interior and exterior. For example, the sequences of digital silence in Portishead's "Strangers" and DJ Food's "Break" are simultaneously experienced as a void of sound or lack of medium signature (the music's exterior) *and* as a sound and medium signature in themselves (the music's interior). For the same reason, the noise in "Strangers" is at once understood as the unavoidable byproduct of equipment from an earlier era (the music's exterior) and as intended musical sound effects (the music's interior). Even the cut-up, glitchy sounds of DJ Food's "Break" are at once received as unmusical sounds—sounds that disturb the music—and as musical sounds—sounds that constitute the music. While the former understanding of all of these sounds derives from our historical listening constraints, the latter understanding of these sounds derives from the tuning of our ears.

The listener's comparison of the music of a recording to both the unmediated environment of the spatiotemporally coherent musical performance, which follows strict acoustic laws, *and* to the contemporary naturalized musical environment, in which anything goes, creates a rather illuminating tension that yields analytical insights into the strategies behind digital music making. Drawing on Hutcheon's insight concerning binary oppositions, I argued earlier that these two inclinations neither merge nor cancel each other out; instead, they appear to work *together* in a

[399] Gibson, 1986: 128.

suspended state perhaps best described as "both and neither."[400] Ultimately, the coexistence of these two perceptual forces, which are constantly competing for our attention, might be one of the reasons why we find ourselves titillated, challenged, or disenchanted by this music.

The Significance of Mediation to Popular Music

In musical examples such as those analyzed in this thesis, in which the mediation is opaque, the significance of this operation is evident—the mediation has a voice of its own, in fact, and insists on its part in the experiential meaning of the music. Here the aesthetic potential of the mediation's self-presentation or signature is dedicated to the production of unique musical effects, and its opaqueness is thus celebrated. But mediating technology is actually imperative to all forms of popular music, even those that privilege transparency. And yet, as Simon Frith observes in "Art versus Technology: The Strange Case of Popular Music" (1986), certain musical contexts such as the rock genre (at least in some instances, if not in the genre as a whole) continue to regard technology as *inauthentic*, and even as a barrier between the listener and the musicians or sound sources:

> The continuing core of rock ideology is that raw sounds are more authentic than cooked sounds. This is a paradoxical belief for a technologically sophisticated medium and rests on an old-fashioned model of direct communication—A plays to B and the less technology lies between them the closer they are, the more honest their relationship and the fewer the opportunities for manipulation and falsehood.[401]

Of course, as Frith is perfectly correct to note,[402] this belief that technology hinders direct communication is paradoxical and, above all else, quite relative—the same listener might accept certain forms of technology while rejecting others, and, as mentioned with regard to the tuning of our ears, some technological features that are initially rejected might later come to be accepted. The question, in other words, is not only how much technology "lies between them" but also how this technology is perceived.

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[400] Hutcheon describes the binary opposition between the said and the unsaid in postmodern parody as follows: "Its two voices [the said and the unsaid] neither merge nor cancel each other out; they work together" (Hutcheon, 2000: xiv).
[401] Frith, 1986: 266–67.
[402] See also Frith, 2012.

Put simply, if we do not notice the technological mediation, it is because this mediation is (to us, at the moment) transparent, *not* absent. The genre labels "electronica" and "techno," for example, imply the application of more mediating technology than the genre label "country," but this stereotype is more the result of *how* technology has been used in the given genre than of *how much* has been used. When music is criticized for being inauthentic because it is too reliant upon technological manipulation, it is in fact less the mediating technology itself that is under attack than the aesthetic that values it (and privileges its opacity over its transparency). What is at stake here is the involvement of mediation *perceived* as mediation, not the involvement of mediation per se. And what is sometimes described as a lesser degree of mediation (and, in effect, a more authentic musical expression) should instead be recognized as transparent mediation and, correspondingly, as a rhetorical attribute or mimetic strategy that is every bit as purposeful as the alternative.

Conclusion

Through this thesis, I have tried to elaborate upon the cultural currency of contemporary popular music and its technological mediation. As mentioned in chapter 1, there is now a considerable range of literature concerned with how technology has affected popular music production in terms of, for example, where, when, and by whom music is made. It is remarkable, however, how little consideration has been given to the ways in which technological parameters affect the music itself. The methodology of music analysis, for one thing, is seldom introduced into discussions of music technology (and, on the flip side, few of the scholars interested in music analysis pay sufficient attention to the technological mediation involved in the music they analyze). Given my overarching concern with the very aesthetics of popular music itself, I have tried to illuminate some of the intricacies around the ways in which technological mediations in general, and digital mediation in particular, inform and transform musical expressions (and musical experiences). In addition to demonstrating that the methodology of music analysis might be pertinent to the process of understanding the cultural significance of technological change, I also hope to have made the case for taking technological mediation into account when studying popular music. Moreover, through my notions of "opaque" and "transparent mediation," as well as my scheme of three different eras of schizophonia, I hope to

have established a useful vocabulary and theoretical framework of musicological procedures for analyzing popular music, and particularly for those analyses that are primarily concerned with music-technological parameters.

The digitalization of technology has clearly impacted popular music aesthetics, as I have demonstrated through all of my musical examples and theoretical discussions. Without the possibilities unique to digital mediation, Kate Bush could not have sonically built the house of surreal, simultaneous, and horrifying spaces musically represented in "Get Out of My House"; DJ Food probably would not have performed the sonic freeze-and-flow dance of "Break"; Portishead could not have produced the compelling intermingling of silence and noise—of novelty and nostalgia—of "Strangers"; and Isosine would have found it much harder to get hold of and then match up his mashed samples for "Psychosocial Baby," to say nothing of distributing the final product. Most likely, none of these tracks would even have existed were it not for digital mediation and the power inherent in its revelation.

Coda

While this thesis has focused on the profound impact of the digitalization of technology upon popular music aesthetics, it raises further issues as well. Another question that would be interesting to delve into is how these intramusical changes have had extramusical consequences. Within a triangle consisting of the audible manifestations of music, the conceptualizations of music and related categories (such as "musician" and "composer"), and the structures of musical institutions and the music industry, it would be interesting to track the ways in which changes in popular music aesthetics have further affected these related categories.

Initially, the audible manifestations of music informed our interpretations of notions such as "musicianship" and musical "authorship," "creativity," and "originality." It is thus relevant to ask whether the traditional notions of these concepts are altered when the music itself changes in some fundamental way, and/or whether they are strengthened as a result of being challenged. "Musician," for example, has traditionally been associated with manual dexterity with an actual musical instrument (including the voice). If the "instrument" is a computer and the virtual cut-and-paste tool, as in DJ Food's "Break" (discussed in chapter 5), is the performer still a "musician"? Might the act of making musical choices during this operation be equated with the "musical skills" required to play the guitar or the piano? Similarly, a "composer" has traditionally been linked to the writing or creating of music for traditional or quasi-traditional musical instruments. If the resulting musical production consists of nothing but a juxtaposition of already existing music, as in mash-up music (discussed in chapter 6), is the curator still a "composer"? And in special cases like these, who is the "author," anyway? Or does this notion disappear altogether amid the collective of music maker, music consumer, producer, and so on? What, ultimately, does it mean to be musically creative and original in the digital era? Are creativity and originality even linked any more? Relatedly, have the criteria for recognition as a skilled musician and composer, or for acceptance at various music institutions, changed as the music has changed? And must the various laws of intellectual property be altered in order to reflect contemporary popular music, or are we witnessing a growing gap in relevance here?

Whatever the answers to questions such as these might turn out to be, it is by now clear that if harmony ever characterized the relations among the audible manifestations of music, our conceptualizations of music and related categories, and the structures of musical institutions and the music industry, that quality is now gone. What might once have been a triangle of interrelated forces has now become a triad of competing sources, and within this tense dynamic awaits the material for numerous academic studies yet to come.

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