

**Regulating Dissemination: a comparative digital
ethnography of licensed and unlicensed spheres of music
circulation**

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Abstract:

This thesis examines the transformations of music circulation and consumption brought about by new media platforms. Specifically, it shows how the social and technical design of online music platforms link the consumption of music immanently to its circulation. The thesis makes contributions to ethnomusicology, media studies, and digital anthropology, as well as to the study of music's technical cultures. It is based on a comparative ethnographic study of music circulation and consumption within two field sites: the commercial streaming service Spotify and the extralegal, unlicensed peer to peer platform 'Jekyll'. Governance comes to the fore in both sites: the study shows how practices of music curation, collection and consumption are regulated by the technical design of these platforms. Surprisingly, music consumption and circulation on Jekyll generates a variety of social relations, including pronounced social hierarchies. This is far less apparent on Spotify, due to the platform's individuated mode of address. The subjectivities of online music consumers are mediated by both their personal histories and by the broader technical genealogies of the platforms they use. The thesis illuminates the mutual interdependencies of the licensed and extralegal spheres, two domains often portrayed as not only separate but antagonistic. It also provides insight into the hybrid modes of exchange that generate digital music platforms. Through examining the entailments of circulatory participation, the study offers new insights into digital polymedia and to labour, exchange and governmentality online, as well as providing nuanced understandings of the ownership and collection of music in digital environments. Moreover, it advances new concepts to identify core aspects of digital music cultures, namely 'circulatory maintenance' and 'circumvention technology'. The thesis shows overall how Spotify and Jekyll are not merely emblematic of emergent consumption practices engendered by new media, but are bound up in the mutual co-creation of culture, engendering novel musical subjectivities, practices, socialities and ideologies. The complex musical, technical and social assemblages formed around music circulation online point to the affective potentials of music itself, producing inalienable attachments to the objects through which music is formatted, experienced, and circulated.

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Chapter 1: Introduction

Beyond here is something like a utopia - beyond here is Jekyll.

Jekyll 2012

Our dream is to make all the world's music available instantly to everyone.

Spotify 2012

Over the past twenty years, music circulation has been dramatically reconfigured. New digital platforms now account for the vast majority of global music circulation, with streaming services and unlicensed file-sharing networks constituting the most widespread modes of music consumption today. Close investigation of these systems is necessary for further understanding music's multiple mediations of digital cultures. In this thesis, I pursue such understandings through comparative ethnographic studies of two online music consumption platforms: the commercial music streaming service Spotify and the extralegal, unlicensed peer-to-peer platform 'Jekyll'. The scale of music's circulation online continues to accelerate: music streaming service Spotify offers a catalogue of over 30 million tracks and adds as many as ten thousand tracks a day, while the so-called 'private' BitTorrent tracker Jekyll indexes over 3 million torrents shared by approximately 150,000 users.¹ In the manner that Jonathan Sterne speaks about the pursuit of perfect representation in sound reproduction technologies as 'the dream of verisimilitude' (2012, 4), we might consider Spotify and Jekyll's orientations as enactments of 'the dream of totality': an always-ongoing pursuit of the entirety of music being captured, encoded and circulated online. This dream can be linked to the broader historical aspirations for a 'Celestial Jukebox': the ultimately comprehensive and on-demand music collection (Burkart and McCourt 2006). Crucially, Burkart and McCourt show how utopian

¹ Due to the ethical responsibility to protect informant confidentiality, 'Jekyll' and other components of its ecology, including all named informants, are pseudonymised in this thesis.

visions of the Celestial Jukebox, in which it affords exciting new musical arrangements for consumers and cultural industries alike, are, in actuality, inherently subject to limits, restrictions, and rules. Spotify and Jekyll offer competing and seemingly incompatible visions of the Celestial Jukebox, with Spotify granting on-demand access (but not ownership) to an unprecedented corpus of music, and Jekyll offering an index of well organized, high quality audio, but with ongoing obligations attached to membership. While these services represent only two of the rapidly proliferating licensed and unlicensed digital music platforms, Jekyll and Spotify represent opposing vanguards in the bifurcation of music circulation online. Jekyll embodies the ‘darknet’ model of unlicensed circulation, evolving in response to the demise of multiple file-sharing sites. Alternately, Spotify represents the most prominent cultural intermediary working to convert listeners away from unlicensed platforms and towards royalty-generating subscription services, and in the process, reshape the digital music commodity itself.

In this way, these two sites are exemplary of the broader trends in digital music, in which unlicensed circulation has mutated, fragmented, and become ever more elusive, while the music industries attempt to wrest back control over the movements of their copyrighted objects. Additionally, the time-period of this research — from 2013 through 2016 — was a historically important moment for both platforms, as well as the ongoing evolution of the digital music economies at large. Jekyll and Spotify were both launched in 2008, but their patterns of expansion differ drastically. After a gradual expansion through Europe from 2008 through 2012, Spotify experienced explosive growth after 2013 once entering the United States market, becoming one of the most influential global commercial music corporations. Jekyll saw extremely rapid and uneven expansion from 2008 through 2010, gradual and

steady growth until 2013, and from 2014 on, experienced a long period of uncertain connectivity and a gradual decline in active membership.

The foremost guiding principle of this work is to treat these two music platforms as an ethnomusicologist, immediately acknowledging the legitimacy and richness of digital music cultures and the lived experiences of its participants. While avoiding reductive and uncritical formulations of internet ‘communities’, multi-year participant-observation within both sites led to a firm understanding of the complexity and strength of socialities engendered by collective music consumption. Thus, sociality is foregrounded in this research, as well as the musicality of these connections, showing how music exchange and the collaborative pursuit of musical knowledge animates and vitalizes these platforms. However, the regulation and control over musical practices enacted by the administration of both platforms leads to further questions about circulation’s social dynamics, as well as the motivations driving participation. As many of the predecessors of both platforms — most notably the notorious peer-to-peer file-sharing service Napster — offered fully unmoderated and unrestricted access to file-sharing networks, the primary commonality between Spotify and Jekyll is how these systems govern participants, shaping permissible music consumption and circulation practices. If Napster afforded the unrestricted dissemination of music to disparate audiences globally, Spotify and Jekyll enforce standards that limit circulation to permitted participants, and only with permitted musical objects. Access emerges as a key analytic, including how access is granted, how access can be revoked, and what actions must be performed to maintain access, both for individuals and broader collectives. In this way, regulation and dissemination characterize the two most exemplary digital music platforms of this era.

Overview of Field Sites

Jekyll

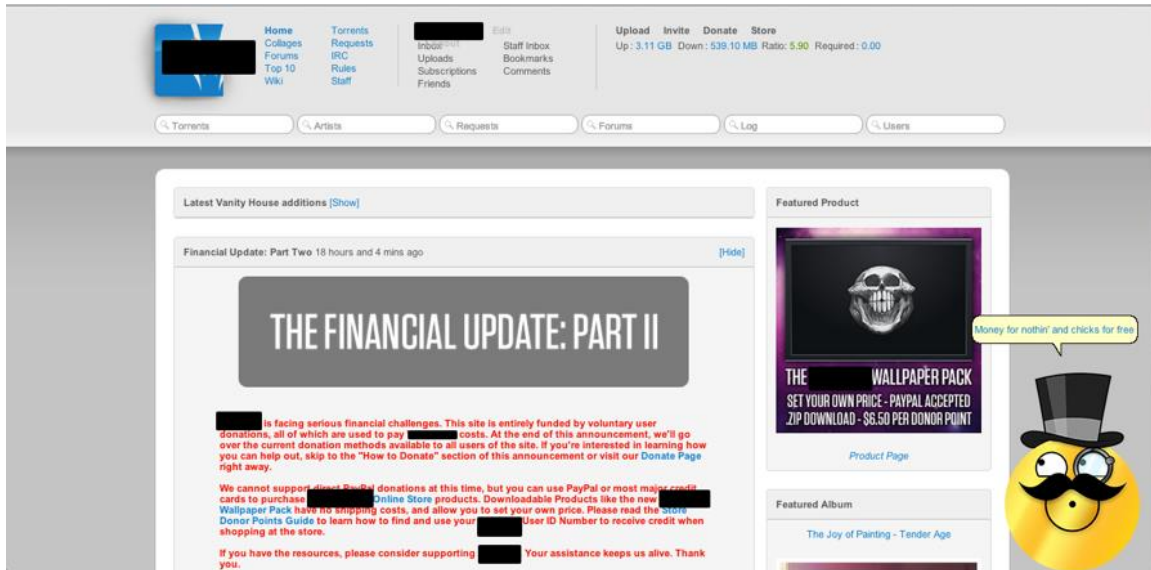


Figure 1. The Jekyll homepage

In order to introduce the unusual configuration of Jekyll as both a putatively ‘private community’ and also a large, highly influential network of unlicensed music circulation, I first offer an overview of its technical architecture. Jekyll shut down on 17 November 2016, after several of its servers were seized by French law enforcement agencies.² In this thesis, I address Jekyll in the ethnographic present tense, and return to Jekyll’s closure in the concluding chapter.

² Jekyll’s geographic base is difficult to define. The physical location of Jekyll’s web servers is intentionally obscured by Jekyll administrators, though evidence suggests that its multiple servers are spread throughout France and Canada. English is the primary language of the site, and the majority of Jekyll’s users hail from North America and Western Europe. However, at least ten percent of members hail from Eastern Europe, South America, and Southeast Asia, with a strong contingent of Brazilian, Chinese, and Russian members; many of these users speak English as a secondary language.

Circulation on Jekyll takes place through the BitTorrent protocol, which was originally developed for the peer-to-peer (p2p) transmission of large digital media.³ ‘Files’ to be circulated are first divided into thousands of ‘pieces’ through the original uploader’s BitTorrent application, called a ‘client’. These are then made accessible on the internet by adding the ‘.torrent’ metadata file to a BitTorrent ‘tracker’, a server that announces new torrents and facilitates p2p connections between uploaders (‘seeders’) and downloaders (‘leechers’). A BitTorrent ‘index’ is a website repository for these .torrent pointer files, allowing users⁵ to browse and search a centralized database for a particular desired torrent. Once a leecher chooses a desired release, he/she downloads the .torrent file, adds it to his/her own BitTorrent client, and begins making connections with as many seeders as possible, obtaining individual pieces from each. As the downloading (‘snatching’) of each piece is completed, the leecher reciprocally begins seeding these pieces to other potential leechers, an immediate technical incarnation of encoded reciprocity. Once the user has completed a download, the BitTorrent client reassembles the fragmented data into the original format, thereby making the files ready for listening.

³ The BitTorrent protocol was created in 2001 by the American programmer Bram Cohen (Ares and Aibar 2011).

⁴ Although BitTorrent can be used to transmit almost any file type, Jekyll almost exclusively entails the circulation of digital music objects. This includes FLAC, MP3 and AAC files, album art images, and metadata files, generically referred to as a ‘release’. The few non-musical upload types allowed, namely applications, are often related to digital music production or consumption, such as digital audio workstations tools for managing music collections.

⁵ In media studies, a ‘user’ refers to any individual who engages significantly with a platform. A ‘participant’ is differentiated by the extent to which he/she makes active contributions to the product, while a ‘consumer’ is expected to ‘lean back’, offering no contributions and having limited agency (see Ridings and Gefen 2003; Yeow et al. 2006). While I make use of all three terms at points, I contend that Spotify and Jekyll users are always participants, in that the technical design of both platforms obliges members to contribute in particular ways. Henry Jenkins writes: ‘Within convergence culture, everyone’s a participant—although participants may have different degrees of status and influence’ (2006, 132).

BitTorrent's decentralization and atomization of peer-to-peer file-sharing belongs to a movement towards distributed computing, in which participation comes to the fore; 'peers' replace the hierarchically-suggestive client-server model, reciprocally sharing data with the entire 'swarm' (i.e., the network of all active users exchanging data on a particular torrent). Following the prosecution of Napster in 2001, the protocol was designed to circumvent attempts to regulate copyright infringement; the tracker and index do not host or directly distribute any copyrightable content. In this sense, BitTorrent redirects the risks (and rewards) of unlicensed circulation back onto its participants, a departure from earlier file-sharing technologies that utilised client-server concepts more fully.

Access-restricted trackers such as Jekyll are a significant departure from conventional 'public' trackers such as The Pirate Bay, where any user is able to access torrents freely; while the vector in the larger 'public' tracker scene is aimed towards further decentralization and anonymization (Born 2013, 31). So-called 'private' trackers introduce further centralization, gatekeeping, and governance mechanics, controlling access to their website, indices, and swarms. In this sense, the terms 'public' and 'private' should be emically understood as indicative of degrees of enclosure. While Jekyll (and likewise, Spotify) may contain and engender musical publics, it is 'private' in the sense that these publics are encompassed within a private boundary enforced by fierce membership controls.⁶

However, these framing of 'public' and 'private' circulation must be interrogated further, due to the fluidity of the terminology. In addition to marking openness, the public/private dichotomy is also widely used to contrast collectivity versus individuality (Weintraub 1997). This meaning is equally important in the analysis of circulation. The

⁶ On the recursive nesting of publicness and privateness in relation to music, see Born 2013.

collective flows of music on Jekyll, as well as the circulation of playlists on Spotify, are generative of musical publics; simultaneously, one also finds individualistic modes of consumption taking place within both platforms. Furthermore, digital platforms are now fully engaged in the widespread mining of user data, a trend that both Spotify and Jekyll participate in to varying degrees: these nascent modes of surveillance and appropriation can be said to accelerate the ‘erosion of prior logics of public and private’ (Hirsch et. al 2017, S6).

Throughout this thesis, my usage of the terms ‘public’ and ‘private’ should be understood emically when distinguishing between open and access-restricted BitTorrent trackers, but as analytical terms when speaking about the formation of musical publics, notions of property and ownership, and user privacy.

Like public music trackers, Jekyll’s website contains a torrent index that lists the entire available distributed music archive, and it also hosts a BitTorrent tracker. Yet in marked contrast to other p2p file-sharing systems and public trackers, Jekyll is an intensively governed and regulated subculture. In opposition to portrayals of file-sharing cultures as fully informal economies (see Light 2004), the Jekyll experience is highly formalised. The most prominent example of this is its codification of social hierarchies. Once applicants receive permission to register with the tracker, they are inducted into a ‘user class’ system, which regulates permitted behaviours and bestows privileges and prestige on members who participate in particular ways. Members’ positions in this hierarchy are primarily determined by ‘ratio’, a calculation of the amount of data downloaded (‘leeches’) versus the amount of data uploaded (‘seeded’). Reciprocity in the p2p exchange is thus governmentally induced: the acquisition of music must be countered by seeding and contributing new releases. From this

calculus, members are arranged into seven classes, with class ascension offering access to class-restricted areas and opportunities to contribute in new ways to the tracker.

Jekyll is also heavily marked by the pursuit of prestige, with symbolic capital being acquired through multiple facets of participation (Bourdieu 1984). Jekyll is characterized by a strong emphasis on audio ‘quality’ and fidelity. Musical literacy is highly valued, with both highly specialized knowledge and general ‘connoisseurship’ offering paths to communal recognition and prestige. Similarly, technical knowledge proffers a parallel prestige economy, one so prominent that I will argue in Chapter 9 that Jekyll constitutes a ‘technical sociality’. Individuals with sophisticated knowledge of data science, programming, digital signal processing and/or access to high-end audio hardware are recruited to join various semi-formalised teams working on such projects as analysing tracker usage data, improving the site’s codebase, evaluating audio, and standardising format rules. These literacies, alongside with other markers of distinction, constitute informal competitive spheres of distinction absent from the formal user class system. Jekyll thus assembles together highly complex socialities, animating multiple modes of social and musical connection, communality, competition, and conflict.

Spotify

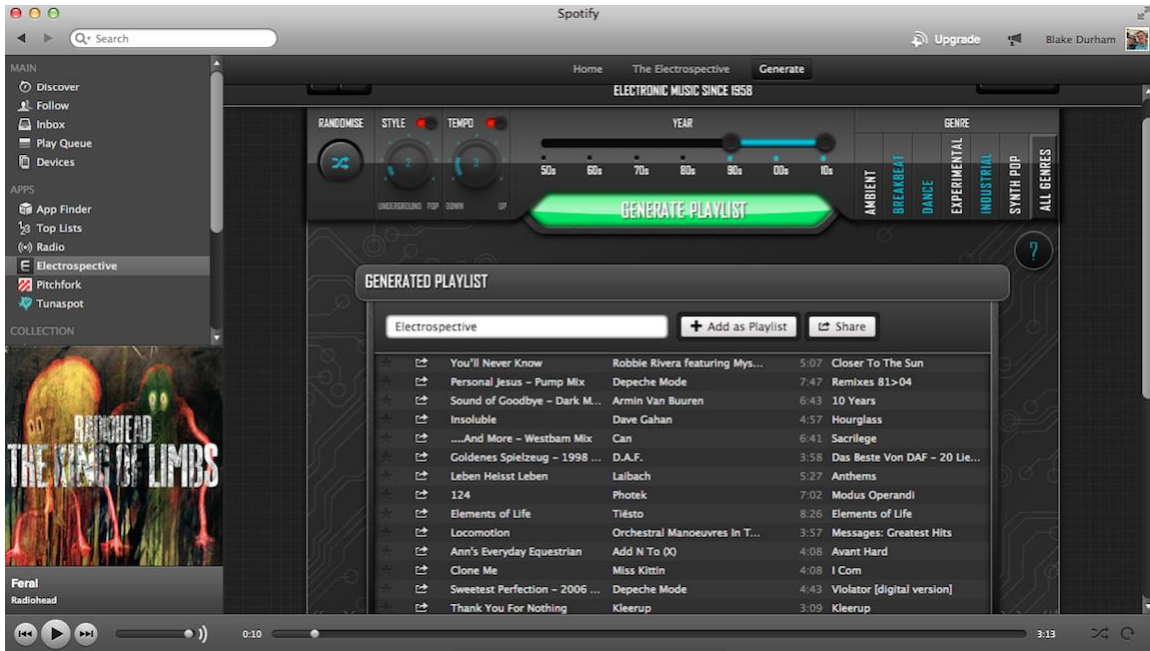


Figure 2. Screenshot of Spotify Desktop User Interface, July 2013

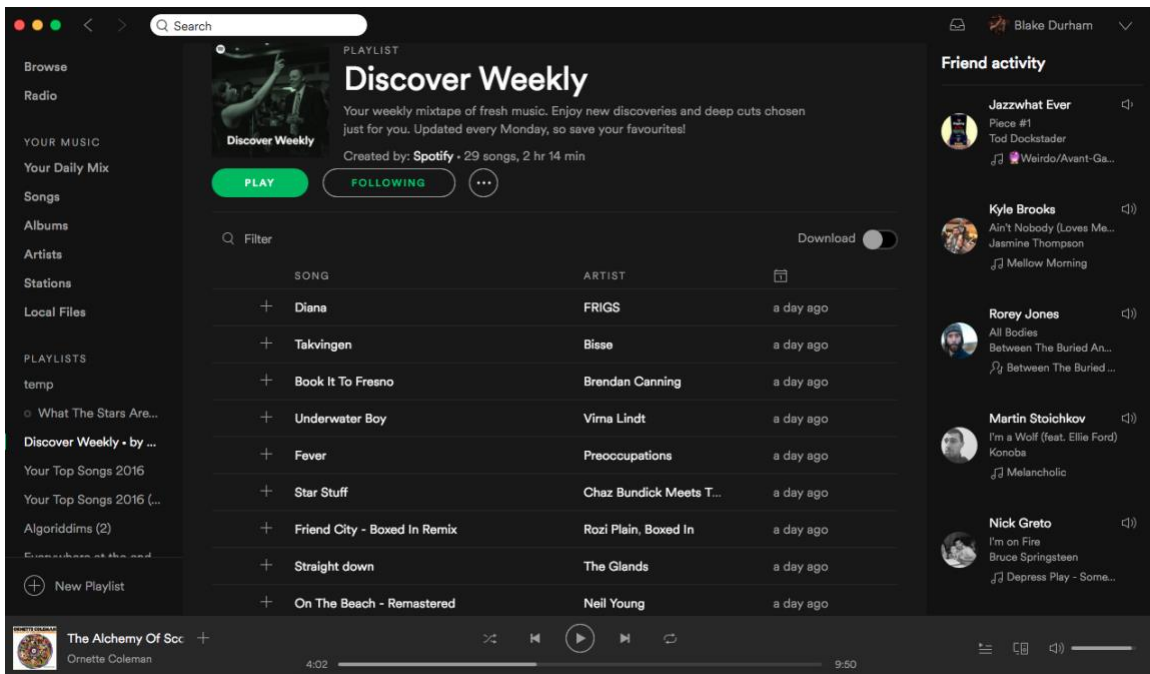


Figure 3. Screenshot of Spotify Desktop UI, December 2016

Founded in 2006 and first launched in Sweden in 2008, Spotify is often taken to represent the vanguard of cultural industry capitalism, expanding innovative technical solutions to the problems that have plagued on-demand music distribution for decades. Despite numerous earlier attempts to develop a subscription-based on-demand ‘Celestial Jukebox’ (Burkart and McCourt 2006), and a fiercely competitive market including Apple Music, Google Play Music, and TIDAL, Spotify was the first large scale music streaming platform, in large part due to the stability and speed of its streaming platform. One of Spotify’s first employees, Ludvig Strigeus, was known primarily as the creator of μ Torrent, an efficient and computationally-lightweight BitTorrent client. Strigeus’s primary innovation for improving the latency — i.e., the temporal delay between the commencement of an internet file transfer request and its completion — of on-demand music streaming was to assimilate the traditional client-server model of licensed services with peer-to-peer technologies, which were primarily associated with unlicensed file-sharing (Kreitz and Niemelä 2010). As a result, Spotify users were able to stream files on demand without significant delays, known as ‘lag’, a widespread challenge that had troubled earlier attempts at music streaming services. With this reduction of ‘lag’ to almost imperceptible levels, in conjunction with the most comprehensive catalogue of ‘unlimited’ music access to date — made possible through unprecedented contracts with all major record labels — Spotify was widely publicized in its nascent years as the ‘future’ of music consumption (see Morris 2011).

Although the term ‘stream’ has historically referred to multiple distinct types of computing technologies (see Morris and Powers 2015), ‘music streaming’ is now understood as services in which libraries of digital music content are made available for on-demand listening without purchase, substituting access for ownership. Spotify users are able to access

these online resources through Spotify-distributed desktop applications, mobile phone apps, an internet browser based ‘web player’, and through an increasing number of ‘partner platforms’, including smart TVs, internet-connected speakers, and automobile stereo systems.⁷ For my informants, ‘Spotify’ almost always refers to the feature-rich desktop and mobile applications, which these supporting playback platforms supplement. As Figures 2 and 3 show, while the design of the Desktop user interface (‘UI’) has significantly transformed over the course of fieldwork observation, principal user experience concepts remain intact. A prominent ‘Search’ bar occupies the left hand corner of the window; personal playlists, followed playlists, and the individualized ‘Your Music’ collection are found in a left-hand, vertically-oriented menu bar; the bottom portion of the window holds the playback control buttons; and lastly, the central viewable portion of the application displays the feature, playlist or album currently being listened to. While numerous social and music recommendation features have been integrated and deprecated⁸ throughout the course of Spotify’s history, these central design concepts dominate the sociomusical experience of Spotify use. Acts of consumption and circulation are oriented around key technical processes, primarily: searching, browsing, playing, ‘saving’, and ‘sharing’.

From 2012 to 2016 — the time period between the commencement of preliminary fieldwork observation and the conclusion — revenue from streaming services grew 507% (IFPI 2016). However, Spotify’s own growth was even more dramatic in this period,

⁷ Although ‘streaming’ implies that each track is accessed from a remote server for each listen, this is often not technically accurate: Spotify ‘caches’ recently listened-to tracks onto the user’s device. Digital Rights Management technology is used to ensure that cached files are not usable outside of the Spotify application.

⁸ ‘Deprecate’ is an emic term in technical cultures for the process of removing a feature from a technical product. Initially, the impending removal of the feature is announced and its usage is ‘discouraged’. Afterwards, developers discontinue documentation and support; finally, the function is completely removed.

increasing from 4 million Premium subscribers in 2012 to 40 million Premium subscribers in 2016, with an additional 60 million active Free users (Spotify 2016). With this rise of the ‘freemium’ business model — with two tiers of membership, a ‘free’ ad-supported membership, and a ‘Premium’ subscription that removes ads and offers additional features — Spotify effectively functions as a music rental platform. In comparison with the legal environment of mainstream physical distribution and digital downloads, in which copyright restrictions place significant limitations on resale, redistribution, and derivative works — what Lawrence Lessig (2009) describes as a systemisation of ‘permission culture’ (2009) — the nature of musical ownership on Spotify is curtailed even further. This system of digital music rental agreements, in which new intermediaries generate unprecedented modes of gatekeeping functionality, is only the most recent iteration of musical rentier capitalism (see Attali 1985). Matteo Pasquinelli proposes that Google’s unprecedented gatekeeper position over internet search results establishes it as ‘the first systematic *global rentier* of the *common intellect*’ (2009: 2, emphasis in original). I adopt this framing of internet gatekeepers and intermediaries as indicative of emergent modes of rentier capitalism throughout this thesis to unpack Spotify’s governance, appropriations and extractions of its participants’ sociomusical contributions, comparing this with the similarly restrictive participatory dynamics of Jekyll.

Research Themes

The thesis is organised around a series of core research questions: *What are the lived experience of individuals subscribing to a music streaming service or holding a membership in a private music file-sharing network? How can researchers most accurately account for circulatory socialities? What are the social entailments, obligations and norms of these*

platforms, and how do informants emically understand these social formations? What new musical, exchange and labour practices are engendered by the technical design of these platforms? Lastly, how should researchers account for the complex regimes of governance that regulate networks of music circulation? These questions engage with and participate in ongoing debates around cultural circulation, the aim of which Will Straw describes as capturing ‘how the movement of cultural forms presumes and creates the matrices of interconnection which produce social texture’ (Straw 2010, 23). This entails engaging with circulation beyond technical accounts of digital file-sharing infrastructures: it demands attention to the social lives of musical things (Appadurai 1986), tracing paths through uploaders, snatchers, curators, contributors, remixers, programmers, administrators, volunteers, listeners, followers, and all other participants who collaboratively co-produce the connections that constitute Jekyll and Spotify as sociomusical assemblages.

Circulation is at the centre of each of these research themes. The primary insight of the ‘circulatory turn’ (Straw 2010) for music scholarship has been to elide the distinctions between production, distribution, and consumption, while also tracing the fluidity and mobility of cultural forms. The concept acknowledges both the infrastructures that regulate the flow of objects through spaces and also the complexity and messiness of cultural configurations (Straw and Boutros 2010). Networks of circulation mediate music consumption and production in a process that David Novak describes as ‘cultural feedback’, where circulation recursively ‘*constitutes* culture’ (Novak 2013, 17; emphasis in original). In this way, Spotify and Jekyll are not merely emblematic of emergent consumption practices engendered by new media, but are bound up in the mutual co-creation of culture, engendering new musical practices, ideologies, subjects, and socialities.

One of the major insights of the thesis is how, due to the social and technical design of digital music platforms, the consumption of music becomes immanently linked to the circulation of music. Jekyll's torrent economy blurs the distinction between circulation and consumption through its shaping of reciprocity; on Spotify, circulation, consumption, and listening become inextricably linked through the platform's instrumentalisation of user data. A second major insight of this thesis is the surprising extent to which music's circulation and consumption generates a variety of social relations, including pronounced social hierarchies. This is particularly evident in Jekyll, in which the pursuit of prestige is one of its defining social characteristics. In Spotify, this is far less apparent, given the platform's mainly individuated mode of address. However, the platform seeks to produce simulations of the socialities of peer-to-peer networks, thereby engendering a limited but distinct type of sociality.

This thesis takes Georgina Born's work on music's social mediation as a primary theoretical and methodological influence. Music not only engenders and mediates socialities, but does so within multiple orders of sociomusical practices, engendering both microsocial formations as well as larger imagined communities, while also refracting broader processes of social identity formation and institutional support (Born 2005, 2010b, 2011, 2013). This rigorous insistence on the multiplicity of music's mediations informs and binds together each facet of this research, while also having served as a useful methodological resolution in an attempt to engage with irreducible social research methods. Georgina Born's model of multiple mediation is particularly useful for comparative, multi-sited ethnographies, offering clear axes on which to build a rich comparison of multiple field sites. The comparison of these competing modes of music circulation offers a multitude of analytical starting points as they

differ so strikingly. The clearest point of difference that informs the analysis is the licensed, royalty-generating business model of Spotify versus the unlicensed and extralegal Jekyll.⁹ Next, the loosely assembled, easily accessed ‘social music network’ of Spotify membership contrasts with the access-restricted and highly secretive path to Jekyll membership. Most importantly, the respective modes of consumption offered fundamentally differ, with Jekyll’s BitTorrent tracker encouraging long-term participation, collection and curation, whereas the very genesis of streaming lies in the attempt to reduce temporal barriers to entry, almost immediately offering a vast catalogue of on-demand musical selections.

The platforms and technologies that engender music circulation are never neutral; they permit and encourage certain flows, discourage others, and stem certain styles, formats and participants entirely. In this way, we can say that the technological assemblages of circulation — not just ‘Jekyll’ and ‘Spotify’ themselves, but the affiliated ecologies of circulation, the internet service providers, personal computing technology manufacturers, and so forth — are involved in the systemic shaping of their users (Akrich 1992). Meanwhile, we must equally consider the ways in which networks of circulation are themselves shaped by their participants, including the multitude of historical and genealogical forces at work: the values, judgments and ideologies that users, administrators and employees bring to these services, the sum total of participatory labour that together forms these networks that would not exist without user labour, and so forth. A genealogical analysis of music circulation platforms

⁹ I use the term ‘extralegal’ here to acknowledge the contested and unsettled status of circulation practices within global intellectual property regimes. Carolyn Normstrom defines the category as ‘all activities that fall outside legality as it is formally defined and used in law and law enforcement. This includes illegal, illicit, and informal, as well as undeclared, unregistered, and unregulated, actions’ (Normstrom 2007; 211). Recognizing music exchange practices as extralegal, as opposed to illegal, allows for a theoretical focus on the particularities of exchange practices that exist on spectrums of formality: from informal to formal, from illicitly circulated to legal distribution forms.

makes visible the profusion of vectors that has shaped the contours and boundaries of both licensed and unlicensed circulation online. In other words, the mutual mediations of music, its engendered social formations, and its technological institutionalizations — here in the form of a private tracker and a licensed subscription service — are deeply entrenched. In this thesis, I engage with multiple orders of music's mediations, with particular focuses on its historical interrelations (Chapter 4), sociomusical practices (Chapters 5-7), exchange and labour relations (Chapter 8), and its technologies and techniques of governance (Chapter 9).

The structure of the thesis is as follows: Chapter 2 frames the thesis with a review of three primary literatures, namely actor-network theory and its responses, digital ethnographic methods, and music's technical cultures. In dialogue with these literatures, I adopt a digital ethnographic method grounded in comparative analysis. Chapter 3 begins the thick description of Spotify and Jekyll, offering the core ethnographic account of both platforms. Chapter 4 further sets the stage by following the genealogies of circulation, examining defunct technologies and modes of exchange that shaped Jekyll, Spotify, relating this to the personal music consumption histories of key informants. This chapter departs from the common depiction of Napster and iTunes as the two primary progenitors of digital music circulation, aiming instead to multiply the range of genealogies and actants at work, while also demonstrating historically how the licensed and unlicensed spheres are mutually mediating. Chapter 5 maps the Jekyll social ecology, drawing on the concept of polymedia and expanding on its use. Next, Chapter 6 examines the musicality of Jekyll participation, with particular attention to the imagined communities animated by genre. Chapter 7 compares these materials with the socialities of Spotify, contrasting the collaborations of Jekyll with the individuated experience of Spotify usage. Chapter 8 analyses the labour and exchange relations of both

platforms, drawing together the multiple modes of contributions users make in their collaborative assembling of the contents of circulation. Chapter 9 examines the restrictions on circulation through the lens of governance, with attention to how regulation is both enforced and resisted through technologies. Chapter 10 completes the ethnography by comparing informants' responses to technological failure and circulatory interruption. Chapter 11 concludes by reflecting on the theoretical contributions made by the thesis, reevaluating the mutual mediations of the licensed and extralegal spheres of music circulation, and lastly, considering the potential futures for digital music circulation and consumption.

Chapter Two: Methodology and Literature Review

In this chapter, I will outline the methods employed in this study of digital music circulation and address three major bodies of scholarly literature that have informed my approach to understanding musical cultures and the digital. Through engagements with this literature before, throughout and after the culmination of my fieldwork, this research was conducted with serious consideration of apposite methodological approaches, and the subsequent ethnographic accounting of this work is situated in light of previous earlier contributions to the field. The analytical framing for this project is primarily based on anthropological, ethnomusicological, and technical cultures literatures. Given ethnography's unique ability to produce rich empirical material for theoretical reflection as well as make sense of complex social relations, a digital ethnographic approach affords the most productive method for the study of digital music circulation. This includes prolonged participant-observation methods with the identified communities and a series of interviews with a wide range of informants. While I employed multiple methods for grasping the diversity of lived experience within my field sites, I contend that long-term participant-observation is the most powerful and acute method for ethnographers of digital circulation, one that is firmly situated in dialogue with trusted informants. Semi-structured interviews with a wide range of actors, including discussions with those who have been excluded from Jekyll and Spotify in various ways, are also of particular importance.

While not conceived as an actor-network theory study, this project strives towards conducting ‘irreductive’¹⁰ ethnography, adhering to the actor-network imperative of attending to the particulars of the empirical findings and the avoidance of essentialist explanations of complex phenomena. Also following from actor-network theory is the necessity of following connections between actors, whether human or non-human. Therefore, the necessity of engaging in ‘multi-sited’ ethnography entails the recognition of the two primary field sites as starting points, not autonomous communities; while following actors including music files, users, protocols, software utilities, and third-party add-ons, multi-sited ethnography affords the flexibility necessary to trace the meandering routes of digital circulation. A fluid combination of starting ethnographic work online and branching into offline settings has allowed for this research to capture important and often overlooked dimensions of the field, such as the demographic makeup of communities, consistency between online and offline identities, offline music circulation networks, and insight into how online behavior is situated within larger lived experience of individuals.¹¹ Another key methodological commitment has been to follow the genealogies of technologies, persons, and practices. The tracing of genealogies (Foucault 1980) can disclose the contingency of cultures, calling into question

¹⁰ While Latour (1988) is the scholar most closely associated with this term, irreductive ethnography is not the sole domain of actor-network theorists: see Piekut 2014.

¹¹ Convincing arguments have been made against the term ‘offline’ as a relic of earlier internet technologies, such as the dial-up modem, whose binary on-off state clearly delineated ‘online’ and ‘offline’ experiences (see Baym 2015). Indeed, the boundaries between ‘connected’ and ‘disconnected’ become further obscured in the era of smartphone ubiquity, particularly in the case of Spotify, where a constant Internet connection is required to stream music in physical locations. However, this example also provides a compelling counterargument: Spotify offers its Premium users an ‘Offline Mode’, which allows for cached files to be listened to when an Internet connection is unavailable. While I acknowledge that the term ‘online’ is no longer as analytically precise as it was in earlier eras of Internet history, I have chosen to make use of ‘offline’ and ‘online’ as pragmatic markers of the primary foci of attention and to distinguish between social relations conducted entirely through digital technologies from those in which individuals communicate both face-to-face and online.

modernist notions of inevitability and progress, and potentially opening up the imagination of alternative configurations of sociality, avoiding the reification of Jekyll's and Spotify's social formations as permanent and inevitable.¹² Genealogical analysis also unpacks the specific histories of technological cultures, therefore producing an analysis of causality of how current practices came to be as they are (Born 1995, 32-35).

The primary fieldwork period lasted from June 2013 through August 2014, with ongoing engagements with the field sites and informants through October 2016. Along with intensive participant-observation, I cultivated long-term relationships with six key informants, three from each field site, whom I spoke to regularly throughout my time writing my thesis.¹³ I also conducted dozens of semi-structured interviews and spent hundreds of hours in IRC and Slack chat rooms, discussing music, current events, technology, and other related topics. I was able to meet several of these informants in person, spending time offline and taking account of the broader lifeworlds of participants of these networks of circulation. Interviews were conducted in both synchronous (e.g., Skype IM and/or voice chat, IRC chat) and asynchronous (i.e., email, Jekyll private messages, Reddit private messages, SMS) media, depending on the preferences of the informant. Several informants, including three key informants, were quite reflexive in their understandings of their personal music consumption practices and preferred time to contemplate their responses, while many informants were only willing to speak for brief periods of time and preferred to answer questions directly.

While my field sites were selected quite carefully, the scale of Jekyll and Spotify's socialities was a constant challenge throughout fieldwork; in an online ecology of integrated

¹² This resistance to teleological narratives is particularly important in the study of technology, in that modernist ideologies of progress are often deeply entrenched in practices of creating, marketing and thinking about technology.

¹³ All informants are referred to with pseudonymised initials.

platforms,¹⁴ delineating where Jekyll began and ended was more challenging than anticipated. I subsequently relied on what is called polymorphous engagement, defined by Hugh Gusterton as ‘interacting with informants across a number of dispersed sites, not just in local communities, and sometimes in virtual form; [this] means collecting data eclectically from a disparate array of sources in many different ways’ (Gusterson 1997, 116). This entails mixing methods available to researchers; Gusterson mentions casual discussions with informants, formal interviews, reading related journals and industry publications, and ‘careful attention to popular culture’ (ibid.). This last point proves particularly interesting in the case of digital music circulation, as locating the ‘culture’ of file-sharing led to major findings about Jekyll, which I summarise as the ‘ecology’ of Jekyll. Engaging in serious participant-observation meant not only gaining access to the tracker, but also reading file-sharing news site Torrentfreak and registering for other private trackers, music taste profile generator last.fm, social content aggregator Reddit, and music database Discogs, among numerous other sites. For Spotify, in order to cultivate deeper relationships, I not only engaged with informants through Spotify’s enclosed social spaces, but similarly used multiple media of communication. Reddit similarly held a significant crossover with Spotify users, but Spotify’s

¹⁴ The term ‘platform’ is used ambiguously at times throughout this work, and a clarification of my usage is necessary. As addressed in Gillespie 2010, ‘platform’ is a political keyword, one that has been deployed by cultural intermediaries to suggest an egalitarian and dynamic space for user-generated content, as opposed to a static and top-down site for the dissemination of information. I chose to describe both field sites as platforms to highlight how Spotify and Jekyll are built on collaborative and user-generated labour. Furthermore, Spotify positioned itself as a platform for the broader music industry through its now deprecated Apps API, which allowed for third parties to develop and publish apps within the Spotify client. Spotify has since recently pivoted towards opening up its resources for integration into other frameworks, but the rich sociomusical ecology contained within Spotify’s resources still merits the word ‘platform’. Jekyll’s underlying development projects, the (pseudonymised) frontend GLIDER and backend ORION, are themselves an open-source framework for private BitTorrent trackers, but similarly can be figuratively understood as a platform for the user-dependent circulation of musical objects. On platforms, see also Srnicek 2016.

own crowdsourced support site, the Community forums, was the most productive social space for locating highly involved Spotify participants.

‘Offline’ research into music consumption cultures was also methodologically productive; ‘hanging out’ in multiple vinyl record shops in New Orleans lead to meeting several key Spotify and Jekyll informants, snowballing new relationships, and also offered perspectives on circulation from outsiders of both field sites. My critiques of Jekyll and Spotify have been informed by discussions with some of these vinyl collectors, who articulated their reasons why they chose not to participate in either subscription streaming or private file-sharing services. This engagement with informants across online and offline locations entailed an agile approach to understanding how participants in circulation imagine themselves as subjects, and how their practices of circulation and consumption are rarely confined to singular spaces. It also proffered greater access to the inner workings of the private file-sharing ecology, as it allowed for potential informants to ‘triangulate’ my reliability as a trusted participant in the broader file-sharing scene (Denzin 1970).

The following section offers a series of reflexive literature reviews, combining engagements with existing work while also considering relevant connections with my research sites. These reviews, which can be broadly categorized as readings in actor-network theory, digital ethnography, and music technology studies, reflect not only my understanding of the existing work in my field, but also a broader engagement with the methodological problems of researching music, culture, and new media. The works considered here inform the entire scope of this thesis, as the methodological insights offered by actor-network theory and digital ethnographies shaped my approach to my field sites. Studies of music’s technical cultures were also formative in my formulation of the musical objects of interest for this work.

However, in each chapter of the thesis, I also introduce new literatures that engage with and inform the specific themes of that section. I now turn to the exploration of actor-network theory and its insights for enacting digital ethnography.

Actor-Network Theory

The origins of the novel sociological orientations grouped under the actor-network label can be located in the early insights of science and technology studies, primarily through the work of Michel Callon, Bruno Latour, and John Law. In their early attempts to develop a sociology of science and technology, they claimed that conventional sociological methodologies, primarily developed under the influence of Émile Durkheim, failed to account for the material realities constructed by scientists and engineers. In later years, Latour contends that Durkheim's entire formulation of society posits the social as a particular domain of reality through which to explain the cause of actions that appeared 'outside' of other domains of reality, such as biology or economics (Latour 2005, 4). Latour, through the invocation of Gabriel Tarde's objections to this mode of sociological inquiry, suggests that 'the social' is not a *thing* or a discrete domain of being but the manner in which actors make connections (ibid., 13). From this refiguring of what constitutes the social — moving from structures which configure agencies to agencies which assemble — the distinctions between nature and society, subject and object, human and non-human, and even structure and agency become subject to productive inquiry. These insights appear in early configurations, not from a return to Tardeian thought, but in multiple studies of science in action. Of particular interest is Callon's study of scallops, marine biologists and fishermen in St. Brieuc Bay, France (Callon 1986; see also Latour and Woolgar 1979, Callon 1980, Callon and Latour 1981).

What at first appears to be an uncontroversial but ultimately unsuccessful implementation of conservation strategies blossoms out into a rich depiction of decentered, networked action: nets, biologists, their scientific colleagues, fishermen, their representatives, scallops and their predators all play crucial roles through the course of the narrative, each mobilizing and being mobilized at different points by other agents. Callon's guiding methodological principles of this study, which he identifies as 'generalized agnosticism', 'generalized symmetry', and 'free association', allow for an analysis of this failed research exercise that would have eluded a Durkheimian approach; in fact, it is unlikely that the study would have ever been undertaken, given its apparent lack of traditional 'social' structures. It was not due to science's privileged study of empirical, non-negotiated reality that new approaches had to be developed, but that science and technology present unique challenges that exposed sociology's historical simplifications.

From these early empirical studies develops a loosely-formed school of thought — not quite 'social method', nor a rigorously defined theory — that has come to be known as actor-network theory, or ANT. Other titles, such as 'sociology of translation' or 'sociology of associations', have been advanced, but actor-network theory remains the preferred choice among English-speaking scholars. Given the diverse and often contradictory approaches to studying social relations that are associated with ANT, I believe it may be productive to briefly outline Latour's most influential insights in order to determine what is being invoked when a study claims to follow an 'actor-network' approach.

Informed by poststructural philosophy (the second half of Latour's *Pasteurization of France*, 'Irreductions', is clearly influenced by Deleuze), Latour's fundamental insight is that nothing can be reduced to anything else, nothing can be deduced from anything else,

everything may be allied to anything else' (Latour 1988, 163). This democratization of being leads to all things, whether human or non-human, being understood as actors or actants. This deposing of the humanist subject as the arbiter of all truths is followed by the necessity of empirical evidence. What is neither reducible nor irreducible has to be tested, counted, and measured' (ibid., 158). If one attempts to explain an event in reductive, structural terms, it inevitably illuminates nothing about the specifics of the event. Rather, one must follow the multitude of actors that have been associated with or deployed to bring about this occurrence, without making presumptions about the importance of individual actors. For example, one may find a faulty voting machine more essential to the assemblage of an election event than the politicians themselves. This leads to the importance of translation, or the manner in which action is transported and transformed through associations of actors. In the case of the malfunctioning voting machine, the voter's decision (which has already been subject to multiple mediations) is translated, or 'mediated' —here defined by Latour as the 'creation of a link that did not exist before and that to some degree modifies two elements or agents' (Latour 1994, 32) — by the technological mechanism. Returning to the voting machine example, this transformation occurs even when the machine is working as intended; the process of submitting a vote is transformed by the particulars of the voting machine — e.g., the layout of the ballot, the degree of perceived privacy and accuracy, the clarity of font chosen.

The difficulty inherent in tracing all the individual actors that are associated is due to their 'blackboxing': the obfuscation of the continual negotiations that occurs in assemblages (Callon and Latour 1981, 285). This misidentification of mediators as mere 'intermediaries' (i.e., actors who do not influence outcomes) results in the construction of apparent macro-actors — kings, corporations, institutions — who appear 'larger' than 'normal' micro-actors.

The unveiling of the black boxes that these macro-actors are “seated on top of” —the variety of associations that they have been able to assemble — putatively demonstrates the flatness of the social (ibid., 286). In ANT, the distinction between micro and macro-sociology are dissolved: the close study of the local interactions of an individual reveals his or her connections and associations, and the global study of institutions and contexts reveals the distributed yet local materials from which they are constructed, evidencing the necessity of seamlessly traveling between frames of reference.¹⁵ It is this constant need to move between frames of reference that is meant by ‘relativism’ in actor-network theory: the modes of enquiry must be as flexible and adaptable as the actors themselves.

At this point, it may be helpful to note departures I wish to make from Latourian actor-network thought. While it may be important to keep the social flat at the beginning of inquiry — one should not presume the existence of social hierarchies or the importance of one actor over another — it is intellectually dishonest to value accounts of the social based on their illumination of Latourian metaphysics, as Latour appears to suggest (Latour 2005, 128). For instance, if a rigorous, well-argued study demonstrates the disproportionate importance of economic incentive in a highly technical environment, and if several non-human actors are revealed to be insignificant, interchangeable, and closer to intermediaries, this may not be a ‘good’ ANT account, but it may be excellent sociology.¹⁶

¹⁵ As some actor-network theorists might dispute my assertion that the ‘global’ can itself be considered (Latour has variously asserted the ‘globality’ of the network as well as its immanent localness), this likely represents one amongst several points of diversion between myself and ANT thought.

¹⁶ While Latour 2005 does acknowledge that some accounts will have intermediaries whose connections have been ‘fully paid’, it is plainly obvious that Latour privileges studies that show large numbers of non-human mediators. While I agree that many (perhaps most) case studies necessitate a foregrounding of mediators, my concern with this privileging is that researchers may abandon perfectly adequate frames of reference in order to locate more ‘actor-networked’ results.

Latour's appraisals of traditional and critical sociology are not without merit, but he unfairly disparages these disciplines without fully recognizing the potential benefits of remaining in close interaction with these theories. When a critical sociologist writes about cultural capital — perhaps the primary target of denouncement in Latour 2005 — it does not necessarily follow that he or she is literally attempting to explain the entirety of networked action through the existence of an ephemeral currency. The invocation of cultural capital only blinds itself to the study of associations when it attempts to explain away behaviors, when it simplifies complexity. There are multiple examples of sociological accounts of music that succeed in demonstrating the multiplicity of actors and their associations while also invoking Bourdieu (see Born 1995; Prior 2008; Thornton 1996). Thus, much of what Latour disparages as 'sociology of the social' remains vitally important to this study, as long as this literature is not used to reductively explain away behaviors; rather, it should be deployed to help illuminate how those behaviors are enacted. My concerns about an orthodox ANT approach are not unique: actor-network theory was still emerging when its proponents began discussing what comes 'after' ANT. As many have written, actor-network theory should not be considered a homogenous approach or methodology; it is constantly expanding, branching off, and being remade by individuals to suit the needs of their research subject. The question becomes not *whither* actor-network theory, but *which* actor-network theory. In the following, I evaluate several notable ANT case studies, with the intention of identifying approaches that resonate with the demands of tracing digital music circulation and consumption.

Andrew Barry's *Political Machines* (2001) is a powerful implementation of the relevance of science and technology studies to other domains of reality — in this case, the

intersection of the political and the technological.¹⁷ Barry introduces the concept of a ‘technological society’, defined not as an era (like an industrial or agricultural society) or a particular configuration of society, but a political attitude or orientation “which takes technical change to be the model of political invention” (Barry 2001, 2). A technological society is one where technology is embedded in both the modes of economic production *and* in the political imagination: the manner in which individuals conceive of the possibilities and responsibilities of government. Barry’s definition of ‘government’, following Foucault, refers not to the specific institutions called governments but the enactments of strategies for managing the conduct of individuals. As a result, the ‘political’ should be understood as “an index of space of contestation and dissensus” (ibid., 7). The political cannot be reduced to politics. Barry argues that politics are often ‘anti-political’ in the sense that political institutions exist in part to limit the range of what is acceptable to debate, and to exclude that which it deems radical (ibid., 207; on consensus politics, see also Mouffe 2005; Žižek 1999).

In the case studies detailed in *Political Machines*, Barry demonstrates how science and technology, those supposedly apolitical forces, can both permit and delimit political controversies. In drawing out pertinent aspects of classic ANT approaches while supplementing their theoretical deficiencies exposed by empirical research, *Political Machines* expertly demonstrates how to deploy actor-network theory outside the study of science. The chapter on interactivity in museums, discussing the public presentation of what is technology, and how the technical governance of visitors is implemented, as well as the chapter on the controversies around intellectual property, resonate strongly with the examination of technologies of governance in this thesis, as found in Chapter 9. Barry also

¹⁷ Callon et al. 2009 prescriptively addresses similar political landscapes, proposing actions towards the ‘democratization of democracy’ through public engagement with science and technology.

offers a framework for understanding how technologies can embody in their technical design diffuse forms of control, which is one of the key findings of the thesis. As I show in Chapter 9, the way in which technical design is enacted in both platform strongly diverges, as Jekyll's administration of particular modes of participation and consumption is vastly different from the innovative reconfiguration of music circulation and consumption offered by Spotify. However, as I show in Chapters 4 and 11, the design of both platforms is in part derived from each other, based on their entanglements in each other's genealogy. Throughout his book, Barry illustrates how individuals in a technological society are expected to become proficient technical subjects, a finding that is further borne out in Chapter 9 with my consideration of the necessary literacies for circulatory participation. Additionally, in Chapter Four, I offer three case studies of individual listening histories, showing how subjectivities are constructed through the mutual mediation between technical objects and subjects.

The governance enacted through technical design, and how technologies are deployed to configure their users, is the second area of actor-network theory that is most important for this study. Madeline Akrich, in her seminal paper 'The de-scription of technical objects' (1992), shows how 'technical objects define actants and the relationships between actants' (ibid., 207). She describes how technical designers create 'projected users' who inevitably are not the same as the technology's 'actual users' (ibid., 209). In this way, 'technical objects define a framework of action together with the actors and the space in which they are supposed to act' (ibid., 208). Arguing that the processes inherent within technical design are at once both social and technical processes, the scripting of 'projected users' ends up as technical prescriptions on how technologies should be used. Actual users end up 'de-scripting' technologies in order to suit their needs, in effect redesigning the technical object (ibid., 212).

This dialectic of top-down design and bottom-up practice, and of the distance between them, is one of the key themes running through the thesis. Both Spotify and Jekyll technically design their platforms to governmentally shape or ‘project’ use, yet actual user practices often do not align with these prescriptions. This is further enriched by bringing Steve Woolgar’s work on ‘configuring the user’ (1990) into dialogue. Woolgar emphasizes how technical design engenders particular modes of engagement, encouraging specific ways of using technologies and discouraging others. For Woolgar, ‘configuring the user’ is the process by which technologies ‘[define] the identity of putative users, and [set] constraints upon their likely future actions’ (ibid., 59). Whereas Mackay et. al (2000) build upon Woolgar by showing how users come to influence technical designers, this thesis builds on Akrich and Woolgar by showing in Chapter 9 how users resist and circumvent the projected uses of Spotify and Jekyll.

The question remains: is it necessary to go ‘beyond’ actor-network theory, or has the field always been in the process of going beyond itself? Gad and Jensen 2010 examines the possibility of ‘post-ANT’, but paradoxically, their findings suggest that a ‘post-ANT’ orientation is the only way to conduct ‘good’ ANT research. This insight is not a recent development. In fact, it exists at the core of ‘orthodox’ actor-network thought. Law writes, “My desire...is to escape the multi-national monster ‘actor-network theory’, not because it is wrong, but because labeling doesn’t help” (Law and Hassard 1999, 2). Attempting to pinpoint actor-network theory as an established entity, a particular and exclusive school of social research hinders association with other potentially productive methodologies: actor-network theory is at its weakest when it reductively ‘blackboxes’ other schools of social thought. As a result, this study is not directly concerned with ‘conducting’ ANT research: the interest here is

in closely following sociomusical practices and attending to multiple orders of mediation, while preferring an approach to mediation theory established by Georgina Born, discussed in detail later. This aligns with the approach favored by Ben Piekut (2011, 2014), perhaps the music scholar who has most comprehensively addressed the methodological advantages of adopting particular principles of actor-network theory. As his research into the complex web of relations that we call ‘experimental music’ shows, actor-network theory supplements careful social analysis by emphasizing the indeterminate shapes of socialites, which he proposes should be referred to not as networks but ‘ecologies’. For Piekut, an ecology is simply ‘an emergent, hybrid grouping that connects many different kinds of things’, a framing that resists simplistic depictions about how actors and intermediaries relate to one another (Piekut 2014, 212). Piekut’s understanding of ‘ecological’ research entails an approach to musical cultures that registers as many effects as possible, one where *relations* are the units of analysis’ (ibid., 213; emphasis in original). This formulation most directly influences my depiction of the polymediatric ‘ecology’ of Jekyll in Chapter 5. Holding these insights in mind, I now turn to consider the field of virtual and digital ethnographies and the methodological insights provided by experienced researchers of technical cultures.

Digital Ethnographies and Method

There is a great deal of literature about ‘the digital’, so much so that this section will narrowly focus only on work which pertains to the ethnography of internet cultures. Debates around the practice of digital ethnography reveal not only methodological concerns, but indicate how methodology informs the most basic of theoretical and epistemological concerns of social research. Markham and Baym’s 2009 edited volume *Internet Inquiry: Conversations*

about Methods is classified as a textbook of online methodology, but its pedagogical value emerges from the demonstrated importance of thinking carefully about method, not from normative prescriptions of qualitative techniques and procedures. The framing of each chapter as a discussion between internet scholars on matters of crucial concern for online research demonstrates the inseparability of method, theory and practice. Keeping this dialogic approach in mind, this section will frame a review of multiple methodological approaches to internet cultures with a critical evaluation of their efficacy in the ethnographic case studies presented.

Before addressing specific works, it may be of some use to identify several notable trends in digital ethnography. Almost all the texts share an interest in the recent debates about ethnographic representation, shifting definitions of ‘site’, and the necessity of reflexivity in writing ethnographically. Similarly, technological determinism is disavowed almost ubiquitously, although it is arguable that the spectre of social determinism is more frequently found within anthropological discourse. While the particulars of the technologies themselves are frequently given adequate attention, ethnographic work on the Internet tends to neglect that the Internet, the World Wide Web and computer networking cannot be reduced to one another. The profusion of protocols by which information can be transmitted from one device to another each offer their own affordances and limitations, on which there remains interesting work to be done.

One of the most popular texts in the field, *Digital Anthropology* (Horst and Miller 2012) boldly opens, in an introductory chapter by Horst and Miller, with a set of six principles, intended to serve as a foundation for the nascent subdiscipline of digital anthropology. Given the substantial body of anthropological literature on digital cultures, it is surprising that Miller and Horst claim digital anthropology to be ‘new’. Several of the

contributions demonstrate the importance and diversity of engaging ethnographically with digital cultures. Boellstorff's essay, while predominantly a reengagement with the theoretical arguments underpinning his 2008 full-length text, acutely positions digital anthropology as a technique, rather than an object of study. It is not the 'digital' that interests anthropologists, but the manner in which virtual sociality points to and is entwined within the offline world. Similarly, the contributions by Postill, Karanović, Barendregt and Ginsburg are notable in their astute, promising ethnographic engagements with dissimilar spheres of online activity — covering digital political engagement, open source software, Indonesian digitality, and disability online, respectively.

Gabriella Coleman's 2010 literature review, titled "Ethnographic Approaches to Digital Media", provides an extensive bibliography of digital ethnographies, which I will not attempt to replicate here. Her analysis and classification of the literature into three overlapping categories — the groupings of politics, cultures, and lived experiences of digital media — should likely be the first point of contact for those considering conducting ethnographic research in digital cultures. Coleman's review presents an overwhelming array of avenues into the literature, with many methodological overlaps and incompatibilities presented; on reflection, I found the most productive article referenced to be the work of Jenna Burrell. Her 2009 article "The Field Site as Network" considers the unique possibilities and challenges of digital field sites, and offers a set of strategies for constructing and envisioning the ethnographic field. As seen by the title, she proposes considering the field site as a network of objects, spaces and people who are collected together by the ethnographer by following a variety of connections. This understanding of how field sites are constructed in motion is heavily dependent on George Marcus' work on 'multi-sited ethnography' (Marcus 1995). As

my ethnography is multi-sited, a close reading of Marcus' work, alongside Burrell's supplementations, was essential in my conclusion as to the benefits of remaining mobile in following fast-moving networks. Marcus 1995 discusses the then-novel trend of derooting the ethnographer from the investigation of a single field site, instead "tracing a cultural formation across and within multiple sites of activity" (ibid., 96); the following of things, people, metaphors, narratives, biographies and conflicts are all proposed as potential techniques for conducting ethnographic research outside of the traditional field site, but insufficient attention is given to the procedures through which researchers can follow these entities. Burrell proposes a series of steps that may prove helpful in filling in the gaps and going beyond 'multi-sited' ethnography as an ideal.

To begin, researchers should find entry points into networks, rather than sites. The Internet cafe she expected to be her field site evolves into a place for meeting informants, who she then follows both in urban and virtual space. Next, in considering the Internet as one among many infrastructures for the movement of objects, the field site becomes more than a single network but a 'heterogeneous network', a network of networks. This heterogeneity reminds the researcher that online activity is not an autonomous sphere of life but is influenced through other modes of connections. Invoking Marcus once again, Burrell suggests researchers situate themselves within a single site but with an awareness of other sites: following the circulation of digital objects within a particular spatial site (an Internet cafe), the connections these users made to other sites, and the origins of the objects circulated. This, in particular, resonates strongly with my need to follow digital music circulation and the restraints upon my ability to physically follow all possible connections. Next, paying close attention to the implied place of activities can signpost the next site of inquiry; similarly, one

must also attend to imagined places, particularly in the case of the Internet, as its spatial limitations induce users to ‘fill in the gaps’ of virtual space through imagination.¹⁸ Drawing out how users envision virtuality, and how these imagined spaces correspond to and differ from experienced reality, is crucial in tracing online activity, as the behavior of users is influenced by these imaginations. Finally, given that networks expand outwards almost infinitely and that ethnographies are understood to be incomplete and necessarily unfinished, the question of where and when to stop are less troubling and can be handled pragmatically, for instance, when time has run out or when new connections begin to repeat old findings. The brevity and simplicity of these steps foreground their intentional incompleteness; no student could mistake these suggestions for a guidebook to ethnography. Not only is this theoretically consistent with the understanding of ethnography as itself incomplete, but the avoidance of over-deterministic frameworks permits the researcher to be more adaptable and attentive to the unexpected networks and relations that are presented in multi-sited ethnography. Chapter 5 is particularly influenced by Burrell’s methodological insights.

A central concern of this thesis is the problem of identifying the social formations that are encountered in fieldwork. John Postill’s 2008 article “Localizing the internet beyond communities and networks,” based on ethnographic fieldwork in suburban Malaysia, argues against the community-network dichotomy that dominated early studies of internet socialities. Attempting to label the social collections studied according to the classic paradigms of networks and communities can blind researchers to the multiplicity of relations actors adopt and enact as internet technologies become even more omnipresent. Postill acutely notes that simply contributing additional conceptualizations of social formations, such as the uncritical,

¹⁸ On the application of ‘imagined communities’ (Anderson 1983) to the Internet, see Bakardjieva and Smith 2001; Gruzd et al. 2011; Kozinets 2010; Lysloff 2003.

normative use of Habermas' 'public sphere', does not necessarily neutralize the difficulties posed by the community-network dichotomy. In line with actor-network theory injunctions against reductionism, "the assignation of membership in a particular cultural category does not tell us, in itself, which categories will actually be drawn on for the mobilization of social relations" (Amit 2002, 18; quoted in Postill 2008, 416). Given these challenges, Postill suggests field theory as a possible starting point for rethinking online relations, following the work of de Nooy, Turner and others, who have included the following of social interactions into their field-oriented work. Turning his attention to the plurality of social formations present in Subang Jaya, Malaysia, Postill details three distinct forms of 'field sociality' as they relate to the governance of everyday life. In conveying how technology is appropriated in these heterogeneous fields for different purposes, Postill suggests that field theory can extend an analysis of technology beyond availability and affordances towards Bourdieuan differentiation, which he offers as an explanation why one particular web forum succeeded where others failed. Postill's work informs my own analysis of Jekyll and Spotify's socialities, particularly in Chapters 6 and 7.

Christine Hine has published widely on online research, and due to the considerable overlap in these works, I will draw out points of interest from two of her books. *Virtual Ethnography*, published in 2000, still contains certain relevant discussions, despite the transformations in online sociality since its publication. Hine proposes that ethnography presents the ideal methodological approach for researching Internet activity, given that the online 'world' should be seen not as technologically determined but envisioned, created and performed by locally situated humans. In considering the internet as both a distinct culture, with its own customs and practices, and a cultural artefact, where its formulations and rules of

engagement point to those of its locally situated practitioners, Hine's conventional approach lacks particular methodological or theoretical innovation, at least in light of over a decade's worth of work on internet research.

However, among all sources examined, Hine takes the most positive view of 'lurking', especially the behavior of users who do not discursively contribute to the community.¹⁹ Hine 2000 outlines how several theories of online sociality exclude lurkers not only from their ethnographic focus but from 'belonging' to the community at all. It goes without saying that highly active, vocal participants make for easier research subjects, but given the anthropological interest in representing ignored and subaltern populations, a more charitable view of lurking (in)activity is demanded. A great deal of discussion forum and social media users can be classified as lurkers, but that does not negate their social importance: one only needs to see the increased server load a sports team's forum receives after a disappointing loss, or the number of votes on a poll question by users who do not contribute to the subsequent conversation, to recognize the material presence of lurkers. Hine's 2013 guide to qualitative online research, titled *The Internet*, also considers the potential benefits of 'unobtrusive methods': lurking, reading archived forum posts, blogs, public social media context, etc. While explaining its particular strengths in researching sensitive matters, such as sexual health, Hine emphasizes the continued ethical imperative of obtaining permission. The impracticality of obtaining consent is not necessarily an adequate defense against concerns about unethical behavior. While striving to ensure that research subjects are not negatively impacted by the ethnographic account is of primary importance, the rich discourse within

¹⁹ Thorough discussions of lurking and unobtrusive research methods can also be found in ethnographies of virtual worlds (Boellstorff 2008, Nardi 2010), an in-depth analysis of which has been removed due to the inapplicability of virtual world methodology for music socialities.

music circulation and consumption platforms leads to the necessity of certain unobtrusive methods, used in combination with deep relationships with carefully chosen informants.

Ethnographies of Digital Music Networks

While only a limited number of large-scale ethnographies have been conducted within networks of music circulation, an engagement with this limited field of work can potentially contain the most important methodological insights, as digital music presents unique challenges as an object of research. Several qualitative studies of online music and file-sharing communities do not approach the research subject ethnographically (Jones 2000; Kibby 2000; Lingel and Naaman 2011; O'Reilly and Doherty 2006), while others claim to embrace certain virtual ethnographic methods but constrain the scale of the research to short-term observation (Baym 2007; Cooper and Harrison 2001; Nieckarz 2005; Wilson and Atkinson 2005). A 2004 study of an alternative country 'virtual music scene' employs methods typically considered ethnographic — extended periods of observation, participation in community discussion, online and offline interviews with members — but revealingly, avoids the term 'ethnography'. The authors highlight the listserv's virtuality, impermanence, and ultimately, its triviality. Here, the significance of the online scene is located only in its capacity to influence the offline alternative country scene (Lee and Peterson 2004). One frequent line of analysis in the literature on music file-sharing cultures has been about the moral justifications on piracy, often working from the assumption that file-sharing constitutes widespread illegal and antisocial acts of copyright infringement (Bateman et. al 2013; Brown 2016; Yoon 2011; see also Schwarz and Larsson 2014). I find this stance problematic and unhelpful for carrying out

comparative ethnographic analysis. In what has been called a ‘post-piracy’²⁰ paradigm, I argue that scholars of circulation should shift focus away from the formerly predominant characterization of file-sharing as antisocial practices of intellectual property rights violations (see Caraway 2012). Many participants in the digital circulation of media are unsure which actions constitute copyright infringement, such as the use of unlicensed and incorrectly credited media on YouTube (Kay 2012). Indeed, by largely bracketing the question of which forms of music circulation are illicit or immoral, close attention can be paid to the actual dispositions of users of these networks, discovering how they relate to these musical objects and their social, economic and aesthetic motivations for circulatory participation.

Jenine Beekhuyzen’s (2009) doctoral dissertation on a small private BitTorrent tracker employs actor-network theory and ‘critical ethnography’ to consider the nature of reciprocal relations in music file-sharing socialities. Given the project’s similarity to my own, it offers several important insights. Beekhuyzen reflects on the profound methodological difficulty of applying actor-network theory, and of the unique challenges presented by digital ethnographies. The dissertation is also a reliable source of technical data regarding BitTorrent trackers and the similarities between licensed and unlicensed digital music networks. It also offers a perspective on the historical context of digital file-sharing, usefully aligning with my own technical genealogy of music circulation. Most important is Beekhuyzen’s pragmatic approach to the ethical considerations of researching potentially illegal behavior. To avoid the possibility of obtaining personally identifying information about users, Beekhuyzen’s contact with individuals remained entirely on the BitTorrent tracker. Her decision to only address users by their username is a feasible approach for protecting the privacy of informants.

²⁰ This term was developed collaboratively by the Music, Digitization, Mediation research programme.

Beekhuizen also offers a compelling account of the practical necessity of conducting participant-observation covertly, given that administrators would likely revoke membership if they realized that their activities were being documented, even with anonymization measures taken to protect individual users. Her conclusions center on the motivations of file-sharing users as largely economic and pragmatic, but she perhaps underestimates the importance of the community's lively socialities and prestige economies.

René Lysloff's 2003 article on online 'mod' communities remains one of the best examples of theoretically sound, pragmatic approaches to ethnographic study of online music communities. Lysloff takes issue with ethnographies of online cultures that highlight textual analysis and articulate the virtual as immaterial, disregarding the material conditions of the users' online interactions. His method, which he calls 'virtual ethnomusicology', outlines many of the arguments later anthropologists would also adopt, including the 'realness' of online sociality, the Internet's affordance of previously 'unimaginable' practices and interactions. Of particular interest to my own work is Lysloff's identification of a 'prestige economy in which "goods" (music modules) are exchanged by electronic means' (Lysloff 2003, 236). Lysloff shows how the circulation of digital media is not simply a transmission of binary data. The files themselves have a certain tangibility or presence: they originate from a particular source, they occupy sectors on a hard drive, they can be manipulated, transformed, visualized, or even broken; they are, in other words, material. While new directions in information system infrastructures, such as cloud computing and streaming models, do require certain considerations — e.g., the physical location of the server on which the file resides may be obscured, remixing of files is made more difficult, and interruptions to Internet access can rupture notions of immediate access and ownership of the stored files — they do not represent

the further virtualization or ‘immaterialization’ of media. While metaphors of file storage may be trending towards the ephemeral (‘floppy’, ‘compact’, and ‘hard’ disks connote something much more substantial than a ‘cloud’ or a ‘stream’), digital technology remains as material and ‘real’ as before. Jekyll’s and Spotify’s materialities are seen most clearly during instances of technical failure, as shown in Chapter 11.

Recognizing that participation (i.e., creating or distributing mod files, not simply listening to them) and social status in the community are interconnected, Lysloff actively engages with the community, creating, sharing and critiquing mod files. All ethnographic research is conducted online, but appropriate attention is drawn to connections with the offline world: the screen names and metaphorical spaces are not described as concealing the Internet’s virtuality but as indicators of the users’ corporeality, their existence somewhere as real people. An incident in which a user’s actions lead not only to his virtual banishment but the publishing of his offline identity serves as another indication of the associations between the two spheres. Attentive to not only the social dynamics of the community but also subjective experience, Lysoff’s brief ethnographic account provides deep insight into the mod community. The closing sentence of Lysloff’s essay reflects one of my primary concerns with studying Jekyll:

When we take such on-line social collectivities seriously and acknowledge the reality they can accrue in the social relationships they engender (think of reality as a kind of capital), we might then finally understand what constitutes community, whether we theorize it as real or imagined.

ibid., 259

If we are to make sense of the complex assemblages that define music circulation and consumption today, we must also attend to shifting notions of sociality, community, and

materiality. Immersive study of internet collectives represents an ideal siting of ethnographic inquiry to encounter these transformations.

Music's Technical and Material Cultures

In addition to the review of ethnographies of online music communities, this project must be considered in light of studies on music and technology. Much of this work comes from outside the traditionally delineated boundaries of music studies: sociologists, cultural theorists, anthropologists and sound studies scholars are all represented within this review. While musicologists working in the subdiscipline of organology have long recognized the importance of studying music technology, their focus on musical instruments, in often functionalist terms, ignores the multiple dimensions in which technologies mediate musical experience. In contrast, Theodor Adorno's close attention to the particulars of music reproduction technologies and their dialectical relationship to musical works (see Adorno 2002a; 2002b; 2002c; 2002d; 2002e) supplements his more famous works on the sociology of music to envision a theory of musical mediation that is attentive to both the material, social and historical dimensions of musical experience. Adorno's insights shape my consideration in Chapter 4 of the interrelations between technical genealogies and personal histories. With Adorno in mind, a brief review of some of the works on music technologies — particularly those addressing issues of music production, circulation, consumption and experience — will be the most pertinent to my work on digital music circulation and consumption.

Georgina Born's ethnographic and theoretical works on music and technology constitute the most influential body of work on the direction of this project. Her 1995 ethnography of the computer music institution IRCAM provides deep insight into a technical

culture of music and compellingly accounts for the social, aesthetic and historical mechanisms that engendered a rationalistic, universalist vision of music, one where technological ‘progress’ is conflated with aesthetic judgment.²¹ *Rationalizing Culture*’s comprehensive ethnographic perspective of a preeminent Western art institution is unprecedented, in part due to the deep level of access granted. Access remains equally significant for digital ethnography, as it entails both admission — i.e, obtaining permission to join the chosen networks — and openness: the researcher, even online, must consider that which is demonstrated ‘publicly’, that which remains private, and how communities construct and imagine the divide between the two. The text demonstrates the importance of ‘getting to know’ the individual, as opposed to limiting the ethnographic approach to participant-observation of group activity, as many telling insights from the fieldwork are gathered in casual conversation and ‘confessional’ moments in which informants feel safe in confiding opinions contrary to the research centre’s norms. The productivity of genealogical analysis is demonstrated in this text. Following Foucault, Born considers the multiple antecedents of the centre, which includes the aesthetic, philosophical, scientific, national, and personal contexts of Boulez, the institution, and its members. Chapter Four embraces this method of tracing the genealogies of technical systems.

In the 2005 article ‘On Musical Mediation’, Born develops of a theory of musical mediation that draws on the mediation theory of Adorno as well as his ambivalent successors, Tia DeNora and Antoine Hennion, while also acknowledging the limitations of their work. For

²¹ Born 1996 and 1999, based on this research at IRCAM, are exemplary engagements with computer software. While these studies are not included in my overview of Born’s work on music and technology, the analysis of computer software as a medium (anticipating the emerging field of software studies, characterized by theorists such as Matthew Fuller) is productive and informative for my analysis of the technical configuration of online circulation networks. The depiction of the hierarchy of computer code in Born 1995 is also a useful model for characterizing the layers of software encountered in music circulation.

DeNora and Hennion, this includes their exclusive attention to the micro-social dimensions of musical activity, which ignores the multiple planes of social relations that impinge upon the musical experience. Drawing on anthropologist Alfred Gell's work on creativity, which highlights the temporality and relationality of objects, Born calls for theories of mediation that trace the historical trajectories of musical assemblages, reconnecting them to analyses of the macro-dynamics of cultural history and technological change' (Born 2005; 34).²² Her consideration of distributed creativity between technologies, artists and audiences convincingly demonstrates the acuity of this approach as well as the relevance to my research. Of particular interest is the attention shown to the distinctive characteristics of digital media, such as its mutability, fluidity and mobility, which afford practices of 'relayed creativity'. Following this, this thesis considers the particular creative practices afforded *and* hindered by online music circulation networks, particularly the ramifications of Spotify's DRM software employed to restrict the usages of its streaming library. The regulatory attempts to stem the flow of digital music remediation and circulation and the adaptation of DRM-removal re-encoding software in response — which connects productively to my analysis of circumvention technology in Chapter 9 — powerfully substantiates Born's argument that mediation cannot be equated "simply with mobility or progressive change" (ibid., 30). Born's theory of mediation affords the dialectical assessment of both the productive and negative dimensions of music's technical cultures.

²² One of the article's many refreshing insights is a coherent definition of the often-nebulously deployed term 'assemblage'. Drawing on Foucault and anthropologist Paul Rabinow, Born uses the term to point to "music's many simultaneous forms of existence," a particularly apt reminder for those studying music technology (ibid., 13).

In the afterword to 2009's *The Cambridge Companion to Recorded Music*, Born proposes that the study of music's mediations, beginning with the issues recording media present for historical musicology, opens up the possibility of reconfiguring the disciplinary boundaries of music studies itself. While historical musicology has only recently begun engaging with the question of music's technicity, popular music studies has been interested in the technical systems of production and consumption since the beginnings of the subdiscipline, suggesting the productivity of a syncretizing approach to music studies. While musicologists such as Lydia Goehr have thoroughly examined the evolving imagination of Western art music and its material forms, Born identifies in her work a perfunctory acknowledgment of "[. . .] the significance of music technologies, as though they had never been the subject of research, only to neglect to pursue their implications for the argument at hand" (Born 2009; 289). Turning to the contradictory proclamations of Adorno and Walter Benjamin on the effects of recorded media on listening practices, Born notes that digital technology has afforded usages of music which support the assertions of both writers: music taste is increasingly selected and employed within an unending project of identity construction, following Benjamin. At the same time, the evolving strategies to condition music listening and mitigate music's subversive qualities — in other words, the continual re-commodification of the musical object — seem to validate Adorno's claims regarding the culture industries. Keeping this dichotomy in mind when looking at music circulation is instructive in avoiding the utopian depictions of online sociality that haunt digital ethnography, while also tempering Adorno's outright rejection of commercial musics. The article also productively brings the work of Jay Bolter and Richard Grusin on 'remediation' to music, noting that while digital media's inherent mutability is integral to current practices of

remixing and recirculation, the digital ‘revolution’ in audio reproduction is still based on analogue media. The ubiquity of music’s circulation, occurring online and offline, requires an understanding of these movements and mutations that cannot be reduced to a new form of music production — i.e., circulation as ‘creative practice’. However, it is also not banal consumption, as in the unthinking, fully subjugated listener Adorno imagines in *Introduction to the Sociology of Music* (1976). My close attention to curatorial and consumption practices reflects this understanding of circulation.

Of the social theories of music reviewed here, Born’s analysis of the four planes of music’s social mediation is the most cogent and insightful, showing how ‘music necessitates an expansion of the conceptual framework of social mediation’ (Born 2011, 378). While ethnomusicology has long acknowledged that music generates many different forms of sociality, Born argues that music does so while crossing scales, and that its planes of social mediation are not reducible to each other. Music engenders both microsocial formations (such as performing ensembles and small listening groups) as well as larger imagined communities, while also refracting broader issues of social identity and institutional support (Born 2005, 2011, 2012). Importantly, this mode of analysis captures the ‘plural and distributed materiality’ of the socialities I trace (Born 2011, 377).) This rigorous insistence on the multiplicity of music’s mediations serves as a useful methodological resolution in attempts to engage with irreductive social research methods. As she shows in relation to genre, the transmission of affect and social and cultural associations are both important in understanding how music’s socialities cohere, but are insufficient and reductive when taken alone (ibid., 385). Complex socialities can only be fully understood through paying attention to the multiple modes of mediation involved in the assemblage. Each plane is addressed in this

thesis, with particular attention paid to the second plane, that of music's imagined communities. Additionally, my focus on economic anthropology and governmentality in Chapter 8 and 9 is in part derived from Born's call for music studies that take the cultural economies of music seriously — her fourth plane of social mediation (*ibid.*) — paying equal attention to these platforms' institutional and conventionally 'musical' forms.

The literature on circulation as an analytical concept informs each chapter of this thesis. Studying circulation entails significant consideration of the socialities generated, the modes of exchange that enact circulation, the material conditions of its existence, and the attempts to stymy, regulate, and inhibit circulation. Studies of music circulation often address the geographic movements of musical forms, styles and objects in light of globalization (Fairchild 2008, Jones 2002, Leyshon et al. 2005, Novak 2013, Stokes 2004). Scholars have also considered the musical 'circulatory systems' of localities as the interactions of different scenes, histories, and audiences in generating new cultural forms (Sakakeeny 2011). This literature is preceded by Will Straw's (1991) exemplary work on musical genres and the movements of forms through scenes. Bearing out my arguments in Chapters 6 and 7 of how circulatory socialities are musicalised, Benjamin Lee and Edward LiPuma's (2002) influential examination of 'interpretive communities' argues that cultures of circulation are animated by 'the abstract nature of the forms that underwrite and propel the process of circulation itself' (192). Circulation is also closely associated with the work on 'remediation', in which new media cultural production references and draws inspiration from alternative media formats, highlighting the intermediality of creative production (Bolter and Grusin 2000). Circulation is analytically powerful because it moves beyond conventional critiques of commodity cultures. Steve Jones writes, 'It is important to mark the moments and movements of music not only

because they tell us about geography, technology, production, distribution and consumption, but also because they help remind us that there is more to popular music than simply the industrial commodity form that moves from record company to retail outlet to consumer' (Jones 2002, 229). By framing Spotify and Jekyll as circulatory systems, I attempt to capture the multiple movements and mediations of music.

The work of Jonathan Sterne represents some of the most productive and useful work on the creation, history and practice of sonic technologies. In 2003's *The Audible Past*, sound reproduction technologies are connected not to the usual predecessors — sheet music, player pianos, etc. — but to stethoscopes, telegraphs, and the rise of techniques of listening and an 'audile' culture. The history of this process of rationalizing and specialization of listening is continued in 2012's *MP3: The Meaning of a Format*, which connects technological limitations in storage, rationalist ideologies of listening as found in psychoacoustics, traces of infrastructure and capitalist profit motives, and contested notions of sound quality (among many other trails) to the emergence of the MP3 digital audio file format. Sterne's work on the MP3 is not only useful because of the pivotal and controversial status of compressed digital audio in my ethnographic sites, but also as a demonstration of the importance of paying close attention to formats, standards and infrastructures, as they can reveal how technology comes to mean what it does in a given culture. While it is only granted limited attention, his refutation of Internet communities as 'gift cultures', which I consider in Chapter 8 is one of the more germane sections to my work (Sterne 2012, 213-219). While he acknowledges potential alternative formulations to describe the modes of circulation online, his attention to the diversity of music piracy communities underscores the necessity for close economic anthropological approaches to notions of 'markets', supporting not only my argument for the

necessity of attending to the specifics of exchange in my ethnographic sites, but also the value of comparative analysis. Given that streaming services and private BitTorrent trackers exhibit vastly different models of music ownership, both also exist in part within capitalist economies, driving demand for consumer goods such as hard drives, mobile devices and headphones. Through comparison, the specifics of these economies —indicative of the proliferation of ‘capitalisms’— become discernible.

Sound recording practices have been a productive site of investigations into the relationships between music and technology: recording technology has afforded transformations in practices of composing, performing and listening to music, and as recording techniques and practices evolve, so does music itself (see Ashby 2010; Chanan 1995; Cook et al. 2009; Day 2000; Eisenberg 2005; Greene and Porcello 2004; Jones 1992; Milner 2010; Morton 2006; Symes 2004). While some works have drifted into uncritical and ahistorical accounts of technology’s deterministic effects, the crucial insight from these works is the necessity of close attention to technological developments. Changes in media render material changes to music itself, and new ways of making, circulating and consuming music cannot be reduced to evolving standards in the auditory documentation of ‘real’ sounds —or, in contrast, as media’s natural progression from previous formats, identical in affective potentialities. While this may be a slightly more timid approach compared to media studies as proposed by Marshall McLuhan, a musicological approach to recording technology reminds the researcher that there is more to technology than its technicity: it is an opening into social, cultural, and musical practices, experiences and meanings. Mark Katz’s *Capturing Sound* is one of the most frequently referenced works on the subject of recording, and his concise, lucid writing style makes for an engaging introduction to the variety of topics studying technology

opens up for music studies. In tracing what he calls the ‘phonograph effect’, the audible manifestations of technology on music, Katz sets out to demonstrate how dependent contemporary musical experience is on recording technologies. Katz’s contribution presents a clear-headed approach to understanding how recording technologies are aesthetic technologies.

While some writings on new media demonstrate concerns about digital audio files and their supposed immateriality and incorporeality (see McCourt 2005; Styvén 2007), a reading of literature addressing older media formats in their nascent stages indicates similar anxieties. Sterne 2003 considers the social processes of the radio and phonograph’s invention and how both technologies participated in shifting attitudes towards the nature of musical experience: the example of advertisements promising that recordings of Enrico Caruso are ‘really’ Caruso’s voice suggest the possibility that the recorded, disembodied voice being something other than Caruso’s was at least considered. Eric Rothenbuhler and John Durham Peters’ infamous 1995 article critiques the arbitrary digitality of the compact disc, arguing that analogue recording is indexical and therefore in closer relations with the original performance. Following a similar logic, Brown and Sellen 2006 characterizes digital audio files as less valuable than CDs and describes participation in peer-to-peer file-sharing networks as unsocial; this is contrasted to offline practices of collecting, sharing and listening to physical music formats in collectives, linking the physicality of traditional audio media and face-to-face, authentic interaction. While this understanding of digital materiality is blatantly misguided, the volume’s emphasis on the social mediations of music afforded by technologies partially redeems the contributions’ uninspired conclusions. The essay by Michael Bull is particularly notable, though it primarily revisits the insights of his full-length ethnographic

accounts of the iPod and Walkman (Bull 2007; 2000). Bull's encounter with music consumption technologies in urban space is attentive to not only the social aspects of this sonic 'individualism' (a point I expand upon in Chapter 7), but also the affective qualities of this particular type of musical experience, and is a valuable example of how music consumption technologies should be studied.

The practice of collecting music recordings began long before the invention of digital technologies, and multiple scholars have addressed the significant social meanings created by music collectors and their interactions with their record collections (Brown and Sellen 2006; Burkart 2008; Cunningham, Jones and Jones 2004; Hennion 2001; Hodgson 2002; Jones 2010; Katz 2010; Morris 2010; Straw 1997). Walter Benjamin's reflections on collecting resonate with the accumulation of music: since many collectors succeed in building an archive larger than he or she could ever listen to, the value of the musical object for the collector is clearly not based in its use or exchange value (Benjamin 1969). Benjamin's thoughts on the role of books' histories and enclosed memories in creating a library recalls recent theories of circulation concerned with the temporalities of objects. Furthermore, his prescient recognition of how the mode of acquisition engenders particular dispositions to the collected object shows how the material and experiential conditions of consumption are mutually mediating. David Rando (2014) links Benjamin's work on archives to music file-sharing, noting how utopian depictions of file-sharing networks ignore the implicit acceptance of music's commodity forms (i.e., the album format). Benjamin also notes the affect invested in the books collected, as well as their personal, cultural and social associations. Benjamin's reflections on the affective dimensions of ownership are foundational to the study of music consumption, pointing to many of the factors that influence my informants' collecting practices.

To reiterate, despite the rich affective ties collectors form with musical objects, digital music carries traces of its commodification.²³ Likewise, the collectability of digital music serves as a reminder of the materialities of digital technology, although some have taken the decreased space occupied by music libraries to be an indication of music's dematerialization (McCourt 2005). Notions of ownership, access, intellectual property, and the 'uses' of music are demonstrated in the close attention to the collection of music (as seen in Chapter 8). For example, Tia DeNora (2000) speaks to individuals about their record collections towards examining how music is deployed in the shaping of identity. In contrast, Jacques Attali considers the record collection negatively: 'Stockpiling thus becomes a substitute, not a preliminary condition, for use. *People buy more records than they can listen to. They stockpile what they want to find the time to hear*' (Attali 1984, 101, emphasis in original). Attali's prescient critique of stockpiling becomes further intensified with digitization: on platforms of near infinite availability, stockpiling and archivist consumption practices have become even more commonplace. Through closely studying the material conditions and history of music circulation, this thesis nuances DeNora's positive and Attali's negative accounts of music collecting.

Lastly, new musical instruments and performing utilities based on digital technology have afforded unique modes of creativity and the production of previously unachievable sonic effects (Duckworth 2005; Goodwin 1990). However, the use of these tools is not without controversy, ranging from aesthetic preferences for analogue technology to proclamations of the immateriality and inauthenticity of the digital (Milner 2009). These concerns resemble

²³ On the commodification of objects and the sociality of things, see Appadurai 1986; on music formats and commodification, see Jones 2002; Manuel 1993; Marshall 2005; Morris 2010; Morris 2012; Straw 2009.

quite closely those directed towards early analogue technologies, suggesting that productive research on music technologies must not only consider the uniqueness of the utilities, but also users' imaginations of what technology is and the diverse methods of interaction with technology (Frith 1986; Penman 2002). Paul Théberge's 1997 *Any Sound You Can Imagine* considers musicians, their attitudes towards their instruments and their status as consumers of music technologies, with a particular attention to changing notions of instruments' role in musical creativity. Théberge's findings that musicians "aligned their musical practices with a kind of behavior akin to a type of consumer practice—a practice altogether different from earlier relationships between musicians and their instruments" is reminiscent of what is often called 'prosumption' (Ritzer and Jurgenson 2010), linking the commodification of musicianship with the changing labour dynamics of music consumption (Théberge 1997, 6). This thesis expands on this literature by further examining the blurring of boundaries between consumption, circulation, and production practices, particularly in the curatorial practices detailed in Chapter 6 and 7, as well as the study of circulatory labour in Chapter 8.

Conclusion

While far from embodying true methodological consensus, the diverse literatures reviewed in this chapter point to the overarching importance of registering multiple modes of experience, paying close attention to the complexity of the field sites, as well as bringing as many contextual factors to light as possible. After Clifford Geertz (1973), this ethnographic holism is best achieved through 'thick description' and engaging with the fieldwork materials through multiple theoretical lenses. The following chapter begins the ethnography of Jekyll

and Spotify, discussing how music is circulated and consumed on both platforms and showing the rich music cultures of both field sites.

Chapter Three: Experiencing Music Circulation on Jekyll and Spotify

This chapter presents the core ethnographic account of Spotify and Jekyll, offering a basic understanding of the participatory experience of both platforms, as well as introducing materials to support the primary analytical themes of this thesis. While later chapters will introduce new materials to further specific arguments, here I articulate the key empirical findings of my fieldwork.

Jekyll

I begin with a reflexive account of my own process of discovering and joining Jekyll. In 2007, after years of regular participation in *ateaseweb* — an online discussion forum consisting of fans of the rock band Radiohead — I was offered an invite to Jekyll's predecessor, the invite-only extralegal BitTorrent tracker Oink's Pink Palace (OiNK).²⁴ I joined in September, only a month before the site was permanently shut down due to an investigation by The International Federation of the Phonographic Industry and The British Phonographic Industry (Socanathan 2011). In this brief period before OiNK's closure, I witnessed the complexity and richness of the culture assembled around music circulation, but made little progress in penetrating the OiNK social hierarchy. I was struck by the rigour of its regulations, and feared being banned for breaking rules I did not fully understand, and so made little use of the account. After the tracker's shutdown in October 2007, I returned to the *ateaseweb* forums to discuss the ramifications of OiNK's closure, but chose to avoid registering at the new music BitTorrent trackers emerging to replace OiNK. In 2012, while

²⁴ OiNK is discussed further in Chapter 4, due to its central importance in the genealogy of Jekyll.

determining the field sites for my doctoral research on internet cultures of music consumption, I returned to ataseweb to discuss the current platforms of unlicensed circulation. I learned that Jekyll, the largest of the genealogical successors of OiNK, surpassed the total number of albums available on OiNK and drastically redefined and reshaped the private BitTorrent tracker experience. Participants in the ‘general music discussion’ subforum on ataseweb seemed to acquire the majority of their collection from Jekyll. Furthermore, discussions of new music frequently referred to the release’s availability on Jekyll and referenced Jekyll’s own music discussion forums. Given this insight into the continuities between OiNK and Jekyll, Jekyll’s vast influence over other online cultures of music consumption and discourse, and the vibrancy of Jekyll’s own social formations, I chose Jekyll as my primary field site for research on music’s extralegal circulation.

The Jekyll Interview and the Regulation of Access

Once receiving approval to begin ethnographic study, I begin the process of obtaining a membership to the tracker. Most private trackers work on an invite system, whereby an established member vouches for the trustworthiness of the invitee. Jekyll was the first major private tracker to supplement this with an open interview system, allowing unaffiliated individuals access to a dedicated IRC channel to undergo an interview with a senior member of the site. Since I am not directly offered an invitation to Jekyll by one of its high-ranking members, I have to undergo the site’s interview process in order to have my request for membership approved.

Once logged into the #jekyll-interview channel, applicants see a channel entry message explaining the rules and procedures of the interview process. The message forcefully

instructs applicants to read Jekyll's 'interview preparation site', which explains the policies and procedures of the tracker, and suggests the likely incomprehensibility of the interview without serious preparation. The interview channel operates as a waiting room, where the only purpose is to 'queue' and wait for a staff member to begin the interview, a process that can take weeks, depending on availability.

This early period of participant-observation is one of the most formative periods of my fieldwork, as the interview process offers insight into how Jekyll not only shapes and regulates participation, but also how it constitutes itself as a sociality. An excerpt from the field notes of my first day of the interview process is replicated below.

The interview channel has been quiet, with only sporadic comments, complaints and short conversations observed, along with the sonic notifications (a clapping sound) of the joining and leaving of applicants. Over 50 people are in the room, of which at least 35 are idling staff members. No one has been interviewed so far, a fact blamed by several on the early morning time for the primarily American staff, while applicants have identified themselves as coming from Australia, Vietnam, Lithuania, Canada, the United States and England.

At 5:02 PM, a new applicant, EW, joins the channel. As over fifty individuals are logged in, many newcomers expect a staff member to greet them upon arrival. EW addresses the room: 'Hello! i want to join Jekyll, can you help me?' He is shortly directed by MC, an applicant who has been waiting for several hours, to 'follow the instructions'. EW enters the proper command to join the queue and is subsequently silent. Five minutes later, another applicant, DV, joins the room, and similarly addresses the channel: 'May i apply for Jekyll', to which EW responds 'folow [sic] the instructions'.

We wait together for several more hours, with no interviews taking place. After five hours of no contact with Jekyll staff, several applicants and I decide to try at a different time.

After signing off that night, I reflect on the significance of the exchange between MC, EW and DV. While the foremost question on my mind—that is, why individuals choose to submit themselves to the regulations of this particular file-sharing platform, when an abundance of alternative avenues for obtaining music are available—was not immediately answered, I recognize that I had observed something of the mechanics of self-regulation that

the site employs. Within a span of minutes, EW transitions from uninformed outsider to an unofficial regulator of the permissible behavior of others. I return to the interview channel for three more days, idling in the queue for twelve hours each time, always remaining near my computer, as I observe that applicants lose their place in the queue if they do not immediately respond to an invitation to interview.

After failing to be interviewed during the first day, I rejoin the channel the following day, prepared to wait indefinitely until interviewed. I remain online for over eight hours, during which time several applicants question the legitimacy of the interview process and suggest that we are just ‘wasting our time’. On the evening of the third day, an interviewer messages me to begin the interview. The structure of the interview itself is byzantine. Relatively few questions concern the ‘Golden Rules’, Jekyll’s core list of regulations (e.g., ‘Do not attempt to hack the site’), and seemingly the most important information about what is deemed to be proper participation in the site. Rather, Jekyll is famous for its strict enforcement of rules covering audio formats, bitrates and encoding methods, and the overwhelming majority of questions in the interview relate to audio compression, permitted formats, acceptable procedures for ripping audio from physical media, and detecting poorly encoded audio. After an additional hour of waiting for my turn to be interviewed, I almost immediately fail the interview, having incorrectly identified the banned WAVE lossless audio format as permitted. I am banned from the channel for 48 hours, but on my second try three days later, I successfully pass the 36-question interview. After concluding the two-hour long process, I receive an email invitation to register an account with Jekyll and begin participating the following day.

The Jekyll interview typically lasts several hours, as several questions are repeatedly

asked in different guises, and close attention to detail over an exhausting time span is required. For example, applicants are expected to have the target and average bitrates of each preset of the LAME Variable Bit Rate MP3 encoder memorized, an esoteric bit of technical knowledge that appears mostly irrelevant to everyday Jekyll participation. As reference to notes or online study materials are banned during the interview process, individuals can be failed for not answering quickly, and the decision to accept or reject an interviewee rests solely with the interviewer. This stipulation into the physical lifeworlds of interviewees strikes me as highly unusual and unenforceable, and yet proves to be highly representative of Jekyll's governmental regime.

The interview system becomes a key component of my understanding of Jekyll's governance, embodying a rite of passage ritual that strives to shape the ideologies and practices of participation. I routinely ask informants about their perspectives on the interview process and discuss its purpose in the Jekyll forums. In particular, I want to understand Jekyll's insistence on elaborate displays of technical literacy—a putative 'security' measure—as well as the onerous time commitment demanded of those waiting to be interviewed. Anthropological literature on rites of passage suggests that these rituals can be understood pedagogically, in that they convey encultured knowledge, generate social cohesion, enforce the importance of communal belonging, and shape the ideology of new members (Kamau 2009; Maruna 2011).²⁵ The question '*Are you ready to join?*,' displayed in bold on Jekyll's

²⁵ Furthermore, unpleasant initiation rituals can bring about cognitive dissonance, inducing disproportionately positive responses and feelings of affiliation towards the group (Aronson and Mills 1959; Gerard and Mathewson 1966; Kamau 2012). Similarly, studies of hazing rituals in fraternities suggest that negative induction experiences — including requiring initiates to wait for extended periods of time before being interviewed — can engender social dependence, tune individual opinions into alignment with group ideology, and enforce the hierarchical social dynamics between group leaders and initiates (Keating et al. 2005; Pomerantz 1995).

interview preparation website, is indicative of this regulation of members: the multiple connotations of the phrase ‘*are you ready?*’ suggest both the desirability and the difficulty of the interview/initiation process. My own experience bears out this interpretation: my relaxed read-through of the interview preparation site and community rules proves to be inadequate preparation, and failing the interview induces me to ‘study’ in earnest over the following days in order to learn more about the norms and rules of the site. Since one of the core functions of the interview process is to regulate the commitment level of those applying to join Jekyll, the difficulty and length of the interview process reduces the number of applications from apathetic, recalcitrant or unprepared individuals. Indeed, among the few lapsed or ‘inactive’ members (those whose accounts were disabled due to not logging in for 180 days) to whom I speak with, all had joined the site through an invitation from a friend. I will later return to the governmentality of Jekyll in Chapter 10, but in the following section, I give an account of the basic experience of participating in the circulation and consumption of music on Jekyll.

Circulating Music on Jekyll

For those with a basic familiarity with BitTorrent trackers and internet forum cultures, the most common first impression upon logging into Jekyll is of the site’s tasteful visual design and coherent content organization. Indeed, the design and navigation are clear departures from mainstream file-sharing platforms, in which banner advertisements typically dominate the top portion of the browser window.



Figure 4. The Jekyll header as first seen upon account registration.

The ‘home’ page lists recent site news and administrative announcements, and links to the primary components of the site are bolded and oriented in a header visible to all members. Personal account settings and information — including a calculation of the account’s current user ratio — are also prominently displayed. Jekyll offers the ability to customize the visual design and layout of the site, a feature called ‘skinning’. I choose an alternative, minimal white and grey theme, finding the wood planks of the default background distracting. While casual members rarely mention choosing a non-default theme, dedicated Jekyll members almost always hold strong opinions about their preferred theme.

The ‘Torrents’ link leads to the torrent index, the core feature of the site. From the index, also accessible from the ‘Torrents’ and ‘Artists’ search bars in the header, members can browse the entire catalogue of Jekyll’s distributed music archive or quickly locate a specific desired release. The catalogue is expansive, with most genres of contemporary Western popular music being present in some capacity. ‘Classical’ music, along with indie pop, rock, and electronica are particularly emphasized. Pre-1950s popular music, along with music of the Global South, can be found on Jekyll, but are not well-represented areas of the catalogue. As described in the introductory chapter, Jekyll hosts .torrent ‘pointer’ files in the index, not the actual digital music files. Participants add these .torrent files to the BitTorrent client on their device to obtain entry into the access-restricted swarms propagated by the Jekyll BitTorrent tracker. Thus, the circulation of music on Jekyll necessarily involves moving back and forth

between the index and the BitTorrent client. Yet despite the preeminent importance of the BitTorrent protocol in affording the technical flows of circulation, the everyday experience of Jekyll participation involves relatively little time actively spent within the BitTorrent client itself. Once a release is ‘snatched’, Jekyll members do not make use of a BitTorrent client to listen to music. Instead, other popular media collection and playback programs are invariably used by individuals to listen to, organise, and manipulate their personal music collections. Such programs include foobar2000, MediaMonkey, iTunes, Musicbee, Winamp, and Spotify. What this indicates is how platforms like Jekyll have emerged as a layer of circulation operating between music’s release and consumption, a layer that, as the thesis will show, introduces a series of elaborate, as-yet untheorised technical and social mediations of the digital music object. This elaboration includes a host of new modes of labour and exchange, as I further address in Chapter 8.

However, BitTorrent clients are always left running as a background process on members’ computers or servers, as senior members of Jekyll constantly impress upon others the importance of ‘seeding’ for maintaining the flows of circulation. When physically hanging out with informants, observing how they circulate and consume music on Jekyll, I notice how little time is spent looking at seeding and leeching torrents within the BitTorrent client. Jekyll’s social spaces (i.e., the online arenas in which Jekyll’s discourse and interpersonal communication take place, which I expand on later in this chapter), the index, and the locally stored music collection dominate participants’ active attention.

Advanced search, filter, and sort options afford multiple approaches to viewing and arranging available torrents. The default search bar functions as a keyword search engine, producing results that contain the keyword within the artist name, release title, or release

description. Further options include the ability to utilise multiple search criteria, such as release year, genre ‘tags’, desired bitrates, source medium, record label, and file size. For example, a participant interested in obtaining all albums released in 1997 with the tags ‘japan’ and ‘metal’ in the FLAC format can quickly filter through and obtain Jekyll’s entire holdings matching those criteria. This fine-grained, highly technical analysis of the Jekyll catalogue is a major motivating factor for Jekyll’s popularity amongst digital music collectors and amateur archivists. It also evidences the valorization of Jekyll’s technical culture over more traditionally musical criteria for curation.

The most notable socio-technical component of Jekyll’s private tracker configuration, one that strenuously shapes the nature of participant experience, is its ratio system. As I explore in Chapter 8 in further detail, ‘free-riding’ behaviours — in which participants acquire data (including music) from swarms without contributing back similar data in kind — plagued earlier file-sharing platforms, especially mainstream BitTorrent trackers like The Pirate Bay. Private trackers like Jekyll are therefore designed in part to combat these problems; they do so by requiring participants to seed back (or upload) an equivalent amount of data ‘snatched’ (or downloaded) in order to maintain membership in the tracker. In effect, the ratio system is an informal economy, where each torrent carries a cost based on the file size of the release. For example, if a participant snatches a 100 megabyte album and then seeds 100 megabytes back to the swarm, the resulting user ratio would be 1. New members of Jekyll are subject to a grace period, allowing them to download 5 gigabytes of data before becoming subject to the ratio system requirements. After this threshold is reached, user ratios that decrease below the ‘required ratio’ (beginning at .15 and progressively increasing to .6 based on overall amount of data downloaded) are subject to ‘ratio watch’, a two week probationary period in which the

participant is required to increase their ratio to meet the required ratio. If this condition is not met, the member loses the ability to snatch new releases until the required ratio is met. Jekyll rules strictly enforce a situation in which each individual can only ever have one account; it follows that if a user account is effectively sunk in an inescapable ratio 'debt', then that member is unlikely ever to be able to participate in Jekyll again. As I show in Chapter 8, the ratio system is perhaps the most characteristic and onerous of the complex web of socio-technical regulations that Jekyll has woven around music's circulation and consumption.

The experience of participating in the mandatory ratio system in Jekyll therefore brings a wholly unexpected form of quasi-economic anxiety, one that drives participants constantly to seek out new releases to seed to the tracker. One of the most frequent topics of conversation in the Jekyll social ecology concerns participants' 'buffer', the term used to describe the amount of data he or she can potentially download before running afoul of the ratio requirements. To illustrate, if a user's required ratio is .5, and she currently has both uploaded and downloaded 100 GB (therefore holding a ratio of 1), her buffer is 100 GB, meaning she can download an additional 100 GB of data before reaching her required ratio (200GB downloaded, 100 GB uploaded, .5 ratio). My informants speak anxiously and often about the challenges of the ratio system and the necessity of participating in a calculating and economic fashion. Jekyll members repeatedly bookmark releases in their web browser so that they can return later to 'spend' buffer they subsequently acquired, much in the same way that a record collector might make a list of desired purchases and wait for more money in order to purchase them. Moreover, Jekyll is consistently conceived of 'emically', in informants' discourse about the site, as an economy. In Chapter 8, I address further the nature of this economy and the modes of exchange that it encompasses.

The onerous nature of the ratio system and its requirements is therefore a core theme of the thesis that follows, since a major proportion of my participant-observation and informal conversation with Jekyll members concerns the ratio system and how the presence of such an ersatz currency within Jekyll shapes the circulatory and consumption practices of its participants. One bizarre result of this system, put simply, is that Jekyll participants do not necessarily snatch the music releases that they want. Rather, they often choose to snatch a release because they believe it would be a good ‘investment’ for their ratio. Popular new releases, if snatched immediately after being uploaded to the tracker, often provide seeders with significantly more buffer than the ratio cost. In this way, Jekyll members often ‘gamble’ through downloading, hoping to capitalize on the future popularity of a release. As I address in Chapter 9, the ratio system’s propensity to create a ‘credit squeeze’ leads to the necessity of counteracting this tendency through the distribution by Jekyll administrators of ‘free buffer’ in exceptional ‘freeleech’ festivals (in this way also injecting currency into the economy). As I address in Chapter 8, the ratio system functions as both an ersatz economy, with buffer representing a type of currency, and also as a ‘moral economy’, in that the imperatives to encourage seeding and avoid freeriding behaviours are also moralistic and social in nature. The ratio system speaks, then, to the ultimately restrictive and challenging nature of ‘proper’ participation in Jekyll, according to its onerous, rule-governed nature.

Uploading new releases is the most important participatory action on Jekyll, a point that is often underemphasized in the literature on file-sharing. Without the investments of labour in uploading via the collective contributions of participants, Jekyll would not exist. The amount of free labour performed on Jekyll is difficult to quantify, but my informants spend anywhere from five to thirty hours a week participating in Jekyll, and a significant portion of

this time is in conducting ‘circulatory maintenance’ (e.g., uploading and seeding torrents, editing incorrect torrents, filling requests, and curating collages). This analysis of circulatory labour in participation is central to my understanding of both Jekyll and Spotify, and is further unpacked in Chapter 8. Uploading on Jekyll speaks to the diversity of processes through which music is introduced into extralegal circulation and also the complex procedures by which music is reconfigured from its commodity forms (e.g., CD albums, digital downloads) into circulatory objects (i.e., files in a BitTorrent swarm). However, despite these incentives, the complexity of the upload process discourages the vast majority of participants from ever completing a single upload, leaving a small minority of dedicated uploaders to contribute the majority of Jekyll’s catalogue.

Although Jekyll is not considered a ‘specialized’ music tracker, there are many restrictions on what music is permitted, the most significant of which relate to digital audio fidelity. The page that addresses uploading rules is over 15,000 words long and details the exact regulations regarding permissible source media and encoding methods. The primary function of these rules is to encourage ‘high quality’ submissions – here understood as full releases, with multiple ‘lossy’ and lossless formats to choose from, and with well-organized paratextual information attached. Indeed, for many in the extralegal music circulation scene, Jekyll is synonymous with ‘high quality’ music, and it is the predominant unifying interest amongst Jekyll participants. While a dozen different audio formats are technically permitted, four formats are elevated above others as preferable. The ‘gold standard’ is FLAC, an open-source, efficient lossless codec, and widely considered the standard for collectors and archivists. The other three are variations of MP3s (known as 320, V0 and V2), and it is clear that FLAC and V0 are the most popular formats because of their putative high audio quality.

Additionally, the ‘source media’ of uploads, here defined as the original release format from which the digital files have been encoded, is strictly controlled by the upload regulations. Although specialized upload procedures exist for older or obscure release media such as live ‘soundboard’ recordings, cassette tapes, and DVD-Audio, the primary sources used on Jekyll are ‘WEB’, CD, and Vinyl. The term ‘ripping’ is used to refer to these processes of converting audio from the original format into a permissible digital object for Jekyll circulation, and a substantial portion of Jekyll’s upload rules and guidelines cover ripping processes, ensuring that the uploads are as ‘accurate’ and high quality as possible. The expression of Jekyll’s technical culture through rules governing contribution is further addressed in Chapter 9.

A representative example of an individual uploading practice here will serve to demonstrate how music enters circulation on Jekyll. One informant, QT, has ripped and uploaded roughly one hundred unique releases, an average number of uploads for an ‘Elite’ member (an emic designator of prestige that will be addressed in the next section). QT does not purchase the majority of his uploaded content. Having joined the tracker while still a university student, a senior member advised him to look through his university library’s CD collection of jazz and classical recordings for missing releases to upload. QT described periodically sorting through stacks of jewel cases, arranging them on a desk in the library, and checking the catalogue number of each disc against Jekyll’s index. If not yet indexed, he set it aside to be uploaded. QT used his laptop’s CD drive to extract or ‘rip’ the audio onto his hard drive, resulting in FLAC files with no associated metadata. The next step was to set the composer, work title, track title, performer(s), year of release, record label, album art, and catalogue number fields within the ID3 metadata tags attached to each file properly. These files were then transcoded to the MP3 320, V0, and V2 formats. The resulting files were then

separated into four folders, so that each folder holds the entire release in one specific format. QT then used his BitTorrent client to generate .torrent pointer files for each of the four folders. These .torrent files were then uploaded to the Jekyll index, which generated a new ‘release page’ in the index, publishing the title and description of the release, along with a link to download the .torrent file granting access to the swarm. At the conclusion of this process, the release is considered a completed upload and has entered circulation on Jekyll. In my close observation of contributory practices such as QT’s, I was struck by the extensive amount of time, attention, and effort spent in introducing new materials into circulation, which informs multiple themes of this thesis, particularly in Chapters 8 and 9.

The final major components of the Jekyll torrent site are the Requests and Collages systems. The Requests system is an incentivisation scheme to encourage participants to upload particular releases. In order to create a request, a member must contribute a portion of their buffer to the desired release, which is then awarded to the first person to upload that release. Other participants may ‘vote’ on the request by using some of their buffer on the request as well. For instance, if Member A creates a request for a rare James Brown album with a 1GB bounty, and 10 additional members each contribute 100MB, the bounty for the first upload to fulfill the request is effectively 2GB.²⁶ Filling requests is one of the most common strategies for participants looking to improve their ratio, as requests often carry bounties in the tens of gigabytes. As such, it operates somewhere between a marketplace and a suggestion box, in which some participants may fill requests based purely on the demonstration of interest, whereas others may wait until a release is sufficiently incentivized before uploading. The Requests page displays the full list of all active requests, any stipulations or explanations

²⁶ As will be explained in Chapter 8, requests are subject to a 10% ‘request tax’, which complicates this calculation. The figures offered here are rounded for the sake of clarity.

about where to obtain the release, and its associated bounty.

The Collages system, a content organization system that affords users the ability to curate themed collections, is Jekyll's most unique technical feature within the private tracker scene. While torrents are generally grouped together by recording artist elsewhere within the index, Collages allow for any arrangement of torrents to be displayed on a single page. As I explore in Chapter 6, collages are creatively deployed, both individually and collaboratively, for a multitude of musical and archivist purposes. These include 'personal' collages, used to define and display individual tastes to the Jekyll public; 'genre introduction' collages, collaboratively curated lists of the most important releases that 'define' a genre; 'discography' and 'label' collages, which are generally the projects of archivists seeking to identify and collect the entire oeuvre of an artist or record label; 'charts' collages, which collect the recommended lists produced by trusted musical journalist publications, such as Pitchfork's 'Best New Albums' and The Wire's 'Releases of the Year'; and 'theme' collages, an open category for participants to curate a collection of albums around a specific concept or communal trait, such as 'Black metal albums that have forests for album covers'.

As each of these aspects of the tracker bears witness to, Jekyll's torrent economy is a uniquely elaborate, onerous, and rationalized mode of music circulation. Participants' musical experiences — e.g., listening, analyzing, discussing, remixing, composing — are largely divorced from the actual mechanisms of circulation. The experience of using Jekyll to acquire and disseminate music is highly calculating and technical in nature, and these complexities of Jekyll's circulatory system are unpacked at length throughout the thesis, particularly in Chapters 4, 5, 6, 8, and 9.

Jekyll Sociality

Jekyll participants have generated deeply involved and rich socialities through their circulation practices. The vibrancy of these socialities, as well as their intrinsic musicality, is an integral aspect of the experience of Jekyll participation, as using Jekyll inherently entails encountering other participants. As an access-restricted file-sharing service, participants are acutely aware that the music they acquire has been contributed by a specific member of the tracker, as opposed to the more anonymous nature of most alternative file-sharing platforms. Informants emically speak about the ‘Jekyll community’ to refer to the collective as a whole, but the term ‘community’ carries further connotations for them. Particularly for highly dedicated participants, the ‘community’ refers to a broad set of shared values, practices, and dispositions towards music circulation, consumption and a sense of belonging within the tracker due to these shared affinities. Furthermore, this sense of ‘community’ emerges from shared involvement in the social history of Jekyll itself and the understanding that long-term Jekyll participation shapes the lives and beliefs of its members. In this sense, I refer to the ‘communality’ of Jekyll social experience. As one of the core findings of my fieldwork, in the following sections I outline the defining cultural characteristics of Jekyll’s social formations and the online spaces in which these relations are enacted.

In my early fieldwork in Jekyll, I encountered many affable and helpful members willing to assist newcomers, who complicated my initial findings of the highly governed, competitive, and restrictive nature of the tracker. Similarly, within the highly formalized and rationalized music economy were a number of altruistic participatory practices that I found puzzling. For instance, my field notes contain early references to the practice of request ‘altruism’, in which participants ‘vote’ on requests not out of personal interest, but to help

junior members get their requests filled. Beginning with the discussion between applicants in the interview ‘waiting room’ IRC channel described earlier, informants clearly believe that the social aspects of using Jekyll are a considerable motivating factor in choosing this tracker over alternative file-sharing platforms.

The depth of the socialities Jekyll contains is highly surprising: there are close friendships, romantic relationships, coteries, ‘genre communities’ (addressed in Chapter 6), and most importantly, a ‘user class system’ that inscribes hierarchies of prestige and social status (addressed in further detail below). Most of these social relations are enacted entirely online, but some members also know each other from face-to-face friendships, emically referred to as ‘IRL’ (‘in real life’) friends. Many friendships have begun on Jekyll and have resulted in these individuals traveling significant distances to meet each other ‘IRL’.

Frequently, Jekyll participants organize concert ‘meet ups’ for residents of specific cities, shifting Jekyll’s ‘social spaces’ from internet-mediated sites to physical venues for copresent listening experiences. In addition to the extensive musical discourse, I observed ‘inside jokes’, long-running debates about the direction of the site, scandals, gossip about fellow participants, and many heated arguments.

Overall, thousands of Jekyll members spend multiple hours a day engaging in synchronous and asynchronous discourse within Jekyll’s primary social spaces, namely its IRC server and online forums. While the forum and IRC are the primary loci in which Jekyll sociality is enacted, numerous additional online platforms are also utilized to afford additional social and musical practices, which has led to a diverse polymediated environment I term the ‘Jekyll ecology’ (addressed in Chapter 5). Much like the torrent economy, individual social practices exist on a spectrum of involvement. The majority of Jekyll’s 150,000 registered

members are infrequent social participants and spend very little time posting on the forums, chatting, and messaging other Jekyll members. I estimate that four thousand Jekyll members represent the most highly involved social participants, while another ten thousand members regularly participate.

Involvement is also fluid over time, with most members fluctuating in their level of participation over the multi-year course of my fieldwork. My first informant, MA, was a core participant in Jekyll communality, having posted tens of thousands of times in the forums, forming dozens of online friendships, and even attending a Jekyll meet up at the popular music festival Bonnaroo with a dozen other highly involved members. Not long after our first informal interview, MA began spending less time on Jekyll, which he explained was due to an increase in 'IRL responsibilities'. By the end of my fieldwork period, MA no longer socially participated in the site, only infrequently logging in to Jekyll to obtain music. Some members would 'disappear' for months at a time, only to return and resume frequent participation. Significant social events, such as 'freeleech' festivals or external threats to the continued operation of the tracker, typically bring out even higher levels of participation and contribution. Ultimately, Jekyll's remarkable social formations cannot be separated from its music circulation platform: the breadth and vibrancy of the file-sharing system is in part attributable to the strength of its internal social relations, and these relations are in part engendered through music exchange.

User Class

Jekyll's user class system is akin to the quantification of its prestige economy. It is a hierarchical system that controls site privileges for users, based on torrent economy metrics,

primarily the user's ratio. As previously explained, the ratio system of the private tracker model introduces an ersatz currency to encourage circulatory contribution and enforce the necessity of ongoing reciprocity. Participants' user class is determined by both ratio and the number of unique uploads contributed. The ratio system and user class system work together to incentivize circulatory participation and award symbolic capital for contributions to the torrent economy. User class, understood as a quantified symbolic capital, is thus the defining marker of prestige within Jekyll.

Hierarchies permeate all aspects of Jekyll sociality. Not only do higher classes possess incrementally desirable powers, such as access to class-restricted social spaces (namely exclusive subforums and IRC channels) and greater control over the collaborative musical index, but they are also entitled to the benefits of social status. 'Lower-class' members are expected to defer to more elevated users in collaborative projects and disagreements over acceptable circulatory behaviors, and multiple informants explained that they had a great deal of respect for the efforts of users from the highest classes.

The user classes to which individual participants are assigned are titled, in ascending order, are User, Member, Power User, Elite, Torrent Master (TM), Power TM, Elite TM, VIP, Legend, Forum Moderators, and Staff ranks.²⁷ Each class is exponentially 'harder' to achieve: Users typically rise to the rank of Member without concerted effort, simply through the course of the first few weeks or months of music consumption. Subsequent ascensions are more challenging, requiring significant contributions: users typically do not advance beyond Power User without consciously attempting to reach the next class. I hereafter emically refer to Jekyll's most powerful users, those who have achieved a more prestigious position within the

²⁷ User classes above Elite TM are not based on upload statistics but are awarded at the discretion of staff.

social hierarchy, as either ‘PU+’ (an abbreviation of ‘Power Users and above) or ‘TM+’ (‘Torrent Masters’ and above).²⁸

Although social participation metrics (e.g., forum post count, hours logged into IRC) do not affect the user class system ranking, I observed a strong correlation between social involvement and PU+ status. Almost none of the committed and active users I spoke to had a class below Power User, even though only 20% of active users hold a rank of Power User or higher.²⁹ Participants in Jekyll’s social spaces often consider PU+ status as a baseline indicator of ‘trustworthiness’, and participants in the PU+ forums and IRC channels are typically much more blunt and forthcoming. In this way, user class is understood as indicative of participants’ level of ‘investment’ in participation.

In order to more fully understand the nature of Jekyll participation, I set a goal at the outset of fieldwork to reach Power User status within the first three months of joining the tracker. Ascensions in the user class system are based on four criteria, ordered by anticipated difficulty: length of time registered, number of uploaded torrents, total amount of uploaded data, and ratio. To reach Power User, members only need to upload five torrents, but the total data uploaded (25 GB) and ratio requirements (.65) are significantly more onerous. In order to ascend past ‘Member’ status, I begin uploading ambient music I have downloaded from Bandcamp: each of these releases is covered by a Share-alike (SA) Creative Commons license, which is authored to explicitly permit non-commercial ‘free culture’ circulation such as on Jekyll.

²⁸ While the privileges of the Power User and Elite classes offer some of the most important and desirable technical functions, it is generally accepted that ‘TM+’ is a much more exclusive and prestigious designation.

²⁹ Jekyll staff published end-of-year statistics, covering membership statistics, in December 2013.

However, the uploading process is significantly more onerous and time-intensive than I anticipated. My process of contributing is similar to the previous description of QT's uploading process. Once I have a copy of the release in the lossless audio format FLAC, I then open the files in the metadata editing application Media Rage. As many artists release their own work with genre, song title, and composer metadata tags that conflict with Jekyll's guidelines, I review each file and make any necessary changes to align it with Jekyll's standards. Next, I use the digital audio utility XLD to transcode the FLAC files into MP3 320, MP3 V0, completing what Jekyll users call the 'Perfect Four' for a release (meaning that all four of the preferred formats are available to download). Once the encoding for all four formats is completed, I move the folders containing each release into a specially-designated 'BitTorrent seeding' folder on my computer, and use the BitTorrent client µtorrent to generate torrent files for each. Once each of these components is in place, I return to Jekyll, navigate to the 'upload' page, enter the release information, and upload the torrent files for each format. On average, it takes me 45 minutes to complete the uploading process for each release.

After uploading five releases, I have acquired less than half of the necessary total data uploaded to ascend to Power User. I begin finding and uploading one new release each day, choosing material I anticipate will be interesting to other Jekyll users. After a little over a month of uploading, I reach Power User and gain access to new user-class specific privileges. As noted above, my 'trustworthiness' is improved by achieving Power User status, and I cultivate several new informant relationships. After learning more from informants about the Elite class privileges, especially the ability to participate in the editing projects described in Chapter 6, I commit to uploading several releases a day. As the standards of the Elite class are

many times greater than Power User, it takes me five months of daily participation and focused contribution to achieve Elite status, the class I maintain until Jekyll's closure.

Invitations to other private trackers are the most desirable benefit controlled by the user class system on Jekyll and also demonstrate how user class is understood to signify trust within the wider private tracker scene. This in turn shows how networked Jekyll is with other private trackers, in that prestige is in effect transferrable to access. Once a participant has achieved Power User status, she can access the 'invites subforum', in which several dozen other private trackers offer 'recruitment' opportunities. While some of these other trackers are musical in nature, with specialized trackers in electronic music, live bootleg recordings and audio production, the majority offer other forms of media, such as films, television shows, and computer applications. Agreements to offer invitations in this manner are negotiated between the administrators of Jekyll and other private trackers. This is highly notable because Jekyll's invitation rules state that one must 'only invite people you know and trust'. In the 'invites' subforum, the implication is that PU+ status is sufficient for establishing trust.

However, prestige is not wholly encompassed by the user class system: users also acquire markers of distinction through alternative avenues, such as prodigious levels of activity in Jekyll's social spaces, donating money to support the site (addressed in Chapter 8), or through the expression of musical or technical literacy. An ethnographic vignette that expresses how prestige crosses over into offline spaces is useful here. One of my key informants texts me that a new friend of his, YK, is an avid music collector and Jekyll participant. He puts us in touch, and by text YK invites me over to his apartment, where we will listen to music and discuss my research. YK warns me that he had moved cross-country to New Orleans only a few weeks ago, and as such, his apartment was sparsely furnished. As I

enter the apartment, I am immediately struck by the presence of a high-end turntable, audio receiver and four-foot tall floorstanding speakers, which are arranged so that they are the first objects visible to entrants, as well as the primary focal point of the room. Upon asking him about the arrangement of an otherwise frugal apartment, YK acknowledges that he had moved only with the contents of a mid-sized sedan, and these large pieces of audio equipment were the main priority when deciding what furnishings to bring. ‘It’s what I want guests who enter to know about me,’ he explains as he begins playing an obscure electronica record on the turntable. Furthermore, YK most often acquires music from Jekyll, and listens to these acquisitions on a pair of studio monitors in his bedroom. The record player and audio system are primarily used when entertaining guests, intentionally situated to signal connoisseurship and participation in musical economies, despite these objects being used in only a small part of his personal listening practices.

This vignette is powerfully representative of many of the prestige-seeking strategies present within Jekyll. Participants often post pictures of their vinyl collections and ‘rigs’ (i.e., audio playback technical assemblages), or otherwise perform their possession of prestigious musical objects and audio equipment. The YK vignette also demonstrates how the prestige economy bleeds over into the ‘offline’ lifeworlds of Jekyll participants. YK, who considers me a fellow Jekyll participant, presumes that I also am personally interested in high-end audio equipment, and therefore positions our initial meeting around objects he expects I would be impressed by.

To summarize, the user class system fundamentally shapes Jekyll’s sociality, directly influencing users to be highly conscious of prestige, which in turn engenders its hierarchical dynamics. While class-restricted privileges are considered desirable, such as editing rights

over the index (addressed in Chapter 6) or access to the ‘invites’ subforum, the primary benefit of PU+ user class ascension is the prestige and seniority it bestows on participants.

Forums

The Jekyll forums encompass the primary social spaces of the tracker, where the majority of users who choose to participate in Jekyll’s communal aspects are most active. The forums are designed in the conventional hierarchical message board format, with 29 ‘subforums’ (or ‘boards’) to delineate types of discussions, and topical discussion ‘threads’ within each board. Jekyll users have cumulatively posted millions of topics in the forums, resulting in an impressively vibrant discursive space.³⁰ I spent much of my fieldwork reading posts and participating on the forums, alternating between public messages on the forums and reaching out to individuals for dyadic interpersonal discussion through the private messaging system, another standard feature for online forums.

As the forums are a ‘catch-all’ space for Jekyll-affiliated textual communication, the types of discussions and questions posted on the boards varied widely, but I categorize them into five groups: Staff-User Interaction, Site Improvement, Musical Discussion, General Discussion, and Help. Staff-User Interaction spaces include boards for staff announcements, where new features, contests, promotions, and other updates are communicated to users. These boards are generally not a space for two-way dialogue between users and staff, as user posts on staff announcements are treated as general comments, not as an ongoing discussion. Staff-User Interaction boards also include suggestion spaces, where users propose changes to the site, from expansive new functionality to mundane tweaks to the tracker or operating

³⁰ For an in-depth analysis of forum structure and message board norms, see Kendall 2002.

procedures, which are either implemented or rejected by staff. Site Improvement boards are spaces for users to collaborate on a number of projects to enhance the site (addressed in Chapter 10), from coding new plugins, software packages, and browser extensions to facilitate circulation to identifying issues with the index and organizing user participation to edit metadata to resolve it. Musical Discussion and General Discussion boards are the most popular boards on the site, hosting the widest variety of content, and are emically referred to as the primary social space of the ‘community’. The Musical Discussion boards serve discovery, analysis, general discussion, and circulatory needs, and host the primary social spaces of ‘genre communities’ (discussed in Chapter 6). The Help boards, along with serving as the primary point of technical support and BitTorrent configuration assistance, are the primary space where new users are ‘instructed’ on proper Jekyll behaviour and include a multitude of collaboratively-authored guides and tutorials on private tracker best practices, audio encoding technologies, and ratio system management, the most well-regarded of which are also reposted on the site’s internal wiki. The frequently updated wiki serves as the central repository for all technical and musical literacy deemed important for Jekyll participation, with a particular focus on guidelines for musical submissions. For instance, a representative wiki explains the necessary metadata and release information changes necessary when a submission contains DJ voiceovers, and another highly technical article addresses the steps necessary to produce ‘high-quality’ encodes, or ‘rips’, of vinyl records.

As the forums are the central spaces in which Jekyll's socialities are enacted, the discourses that they contain are largely representative of the social dynamics of Jekyll. Topics discussed range from intimate personal details to broad discussions of music, politics, philosophy, and technology. ‘YART’ (short for ‘Yet Another Relationship Thread’) posts are

among the most common, in which the topic creator describes the status of his or her current romantic relationship and solicits advice. Along similar lines, many threads involve the discussion of ‘IRL’ concerns, such as conversations about employment, finances, education, and mental health. While sarcastic comments are not absent from these threads, in general the tone of these discussions is supportive and personable. In less sensitive discussions, such as ‘What are you listening to?’ or current events discussion threads, the overarching tone of the conversations is irreverent and often snarky. Indeed, conversations so often become unpleasant, with multiple individuals posting personal insults or otherwise objectionable content, that the forums have become the most heavily moderated section of Jekyll. As a result, Jekyll administration has developed an entry-level staff role entitled ‘Forum Moderators’, held by trusted longtime forum participants, who are tasked with overseeing discussions and enforcing rules about proper codes of conduct. Forum participants are ‘warned’ if they are found in violation of forum rules, and may be temporarily or permanently banned from participating in the forums if the disallowed behaviour continues. Using gendered and racial slurs are the most common reason for warnings, along with personal harassment and arguing with Jekyll staff.

A subforum dedicated to ‘serious discussions’ called ‘The Library’ holds many of the most insightful threads on the forums, and is the area in which I most frequently participate. While any topic is permitted as long as the threads remains thoughtful and well argued, reflexive accounts of personal music circulation practice is the most common topic of conversation. A long-running thread titled ‘Why do you pirate music?’ offers deep insight into individuals’ ethical, economic, and aesthetic justifications for file-sharing participation and led me to develop relationships with multiple informants. Politics is the other predominant

topic of the board, and most participants' political positions can be characterized as either socialist or libertarian. Music criticism and aesthetics are also occasionally discussed here, but the majority of musical discourse takes place in the Music Discussion boards (addressed in Chapter 6). The Library is closely moderated, with rules meant to encourage 'intelligent and civilized debate'. The Library's rules include a minimum post length and a dozen other guidelines meant to combat pithy, sardonic, and other 'trolling' comments often found in the other discussion subforums.

Due to its intensive moderation, the discursive environment of The Library is notably more civil than other boards. Certain subforums are less moderated than others, in which particular 'inside jokes' and topics of conversation are less restricted than in the primary discussion boards. Class-restricted boards are not subject to the majority of Jekyll forum rules and have developed into alternative spaces for discussing topics not permitted elsewhere, such as the previously described Invites subforum. Within the Power User class-restricted subforums, 'drugs' are the most common topic of conversation, due to detailed conversations about illicit substances being discouraged on the main general discussion boards. A subculture of self-proclaimed 'psychonauts' (i.e., persons who frequently experiment with new psychoactive substances) use these forums to post and compare 'trip reports' after experiencing a new chemical. While this does not characterize the average Jekyll participant, a permissive stance regarding drug usage and legalization is commonplace.

Torrent comments are also included in Jekyll's forum system. Participants can leave comments on artist or release pages, with discussions on popular albums' release pages typically reaching several hundred posts. Torrent comments offer an alternative space for musical discussion, often in the form of non-linear, personal initial reactions to the release,

while more substantive analysis and discussion are held elsewhere. One member, pseudonymised as OG, has become one of the site's most well-known users. One of Jekyll's most influential EDM listeners, OG, posts the same comment ('good lookin son!') on each torrent he downloads, amounting to over 2,000 identical torrent comments. The phrase developed into a marker of communality and shared musical affinities, with commenters awaiting OG's 'seal of approval' on significant EDM releases.

IRC

Jekyll's Internet Relay Chat (hereafter IRC) server is very active, with over one thousand users typically connected at any given time. IRC servers host highly customizable chat rooms, with a small collection of 'official' staff channels and several hundred user-created 'interest' channels, with topics including programming, other private trackers, and musical genres. This use of a seemingly-outdated technology is closely associated with the genealogy of file-sharing and torrent trackers (addressed in Chapter 4): IRC has been used for and closely linked to P2P file distribution networks since the 1990s, and a surprising number of site functions are designed around the strengths and limitations of IRC channels as a medium for disseminating information. Many essential site elements, including a channel for users needing assistance recovering their login details, a channel for disabled users seeking to rejoin the site, automated new torrent submission announcements, and the interview system, which is addressed in detail later in this chapter, are handled through IRC.

While IRC is the most effective platform within the Jekyll ecology for the formation of smaller communities of interest, affording synchronous communication between like-minded participants that also scales easily as the social relations expand (as seen in the example of

#indie, addressed in Chapter 6), the IRC channels also hosts the majority of inflammatory and anti-social behaviours I encountered within Jekyll. The genealogical affiliations of IRC participation, with its lineage based on free culture and open source software development, hacking enthusiasts, and ‘underground’ file-sharing systems, undoubtedly influence the social dynamics of Jekyll’s IRC server.

Although the majority of rules governing acceptable behavior elsewhere in the Jekyll ecology are putatively applicable to IRC, it is common knowledge that the primary discussion channels are less moderated. I regularly observe homophobic and gendered slurs in #Jekyll. Users are instructed to report unacceptable behavior by using the !mod command, which draws the attention of any online IRC operators, but in doing so one must be willing to suffer the social consequences of the entire channel knowing *you* were the one who reported them. This is not an issue when reporting content on the forum, as reports of abusive behaviour are handled through private messages. During my second month of fieldwork, I attempt to call for moderators to clarify the channel’s rules after witnessing a particularly homophobic argument in #Jekyll. In response, I receive a dose of profanity-laden invective from several users, with the general sentiment conveyed that I should expect this type of behaviour, that I was ‘new to this’, and that being offended by homophobic slurs was unreasonable. No moderator is available to respond, so my request for moderation goes unheard and the incident is not mentioned again in the channel. Comparing the forums to IRC, the differing standards of governance affect the tenor of the spaces, I point that I return to in Chapter 5.

Nonetheless, IRC is also a medium for positive social relations and some of Jekyll’s most intriguing sociomusical practices. Musical discussion permeates most of the several hundred channels on the server, and many of the genre communities I analyse in Chapter 6

primarily exist as private IRC channels. Throughout fieldwork, my IRC client automatically connects to the server any time I am actively on my computer, which results in thousands of hours of idling in my chosen channels. I participate primarily in the main #jekyll channel, but periodically join other channels for discussion and observation, including #tech, #ambient, #indie, and class-restricted channels. Due to IRC's synchronous format and its less rigorous governance, IRC channels contain some of the most exciting and revelatory discussions within the Jekyll ecology. The off-handed thoughts and comments participants contribute are much less closely edited and calculated than forum posts, and therefore often provide closer insight into informants' worldviews. Most of my interviews are conducted in private chats on IRC, as I find the flow of semi-structured interviews in this trusted, informal and synchronous medium much more productive than interviews by email, forum PMs, or alternative online messaging platforms.

Spotify

After six months of exclusively conducting fieldwork within Jekyll, I begin comparatively studying Spotify. Aside from cursory usage necessary to prepare for fieldwork, I have not used Spotify before. This personal lack of familiarity with the streaming service — its user interface, social customs, and musical affordances — is intended as a method for unpacking the novelty of Spotify music circulation and consumption. One of the principal challenges of ethnographically portraying a highly popular commercial platform is a tendency to gloss over what amounts to highly significant features and social practices, due to their seeming mundanity. While common elements of internet services are key features of Spotify, such as search, 'follow' and 'share' functions, my fieldwork involves paying close attention to

how these features are involved in and shape informants' musical practices. Despite its resemblance to earlier music consumption platforms, Spotify is highly unique, and requires a similar level of ethnographic detail as Jekyll in order to fully account for the new musical practices it engenders. I adopt Spotify as my primary platform for personal music consumption, beginning first with three months on the Free tier, and then another year (and beyond) with a Premium subscription. My fieldwork includes documentation of the Spotify application itself, the continual release of new features intended to encourage usage and shape consumption practices, and the various supplemental add-ons and 'apps' that participate in the broader Spotify ecology. Most of my richest ethnographic materials and informants come from spaces outside of the Spotify application, including informants met through snowball sampling beginning with my key informants. My multi-year participant-observation of Spotify's crowdsourced customer support forums, called the 'Spotify Community', also provides rich materials to support my key arguments about the dynamics of online participation.

Spotify offers access to its streaming service through 'apps' on over a dozen operating systems and products, many of which differ considerably in design, capabilities, and features. The expanding availability of Spotify on internet-connected devices and features such as Connect thus encourage 'ubiquitous listening' (Kassabian 2013), in which the streaming library follows users through multiple 'moments' in everyday life, such as driving, riding public transportation, exercising, and even moving from room to room within the user's home. This is in marked contrast to my early observation of Spotify, which encourages active, focused interaction with the Desktop application. I address the shift in Spotify's focus from 'lean-forward' to 'lean-back' listening in Chapter 7. As of 2013, the Desktop application (with

Windows and OS X support, and an unofficial Linux offering) is the most popular and feature-rich method for accessing the Spotify service. For those unable or unwilling to install the desktop application, the 'Web Player', a limited adaptation of the Desktop application operating within a standard web browser, is also available. Applications on mobile operating systems (i.e., iOS, Android, and Windows Phone) are more limited in functionality. Integration into so-called 'partner platforms', such as Sonos wireless speakers, Sony Playstations, and BMW car stereos, are even more restrictive and limited in scope, often only allowing access to personal playlists and Radio features. As such, the Desktop application initially offers the richest materials for documentation and observation. Due to the decreasing popularity of the Desktop application and the rapid expansion of mobile listening, Spotify now considers iOS and Android the primary Spotify platforms, and these mobile apps are now designed to afford easier control over 'secondary applications', i.e. partner platforms. For example, Spotify applications on 'smart' TVs encourage users to control listening sessions from the iOS or Android app, through a cross-platform synchronization system called Spotify Connect.

Consuming and Circulating Music on Spotify

A first striking observation about the visual design of Spotify's user interface (UI) is how reminiscent it is of earlier digital music management software, particularly Apple iTunes, but also many extralegal file-sharing applications (the genealogy of which I analyse further in Chapter 4).

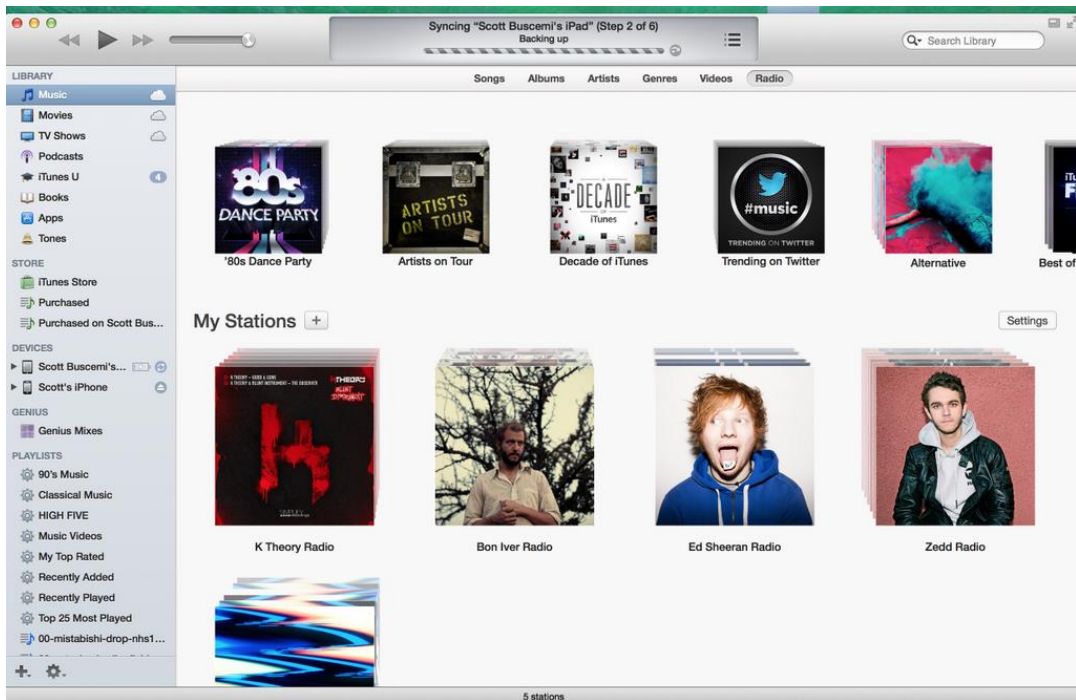


Figure 5. iTunes UI circa 2013; visual emphasis on the left sidebar (Zibreg 2013).

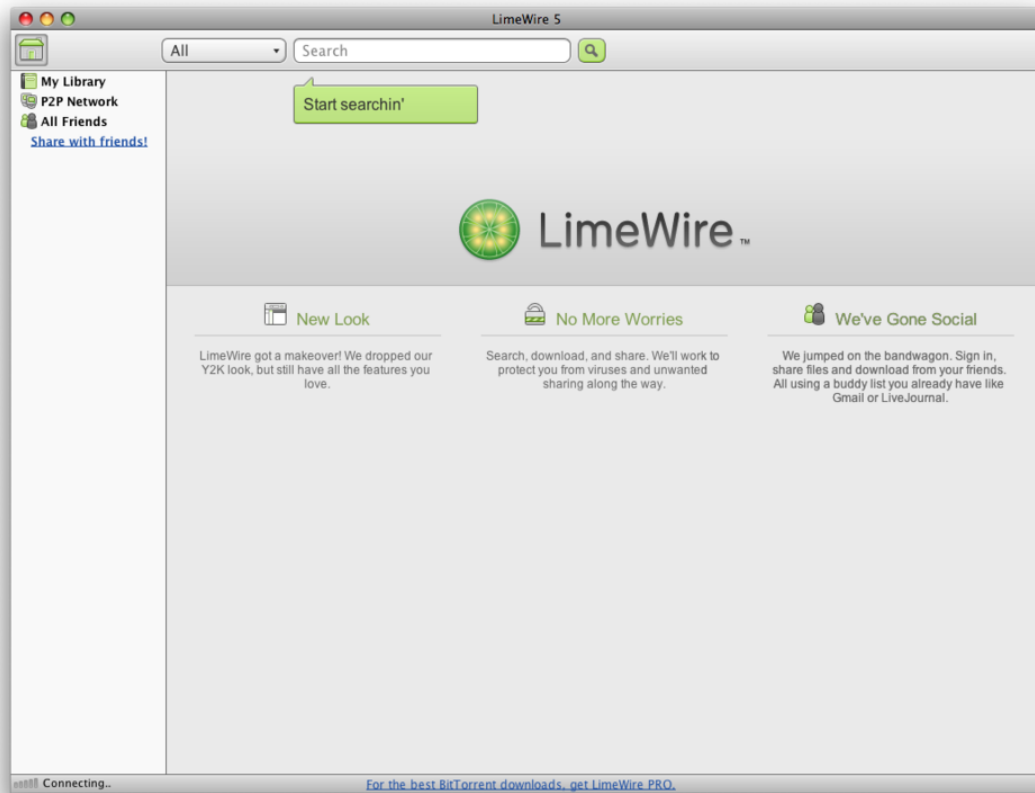


Figure 6. Limewire UI, circa 2009; visual emphasis on search bar (Wikimedia 2009)

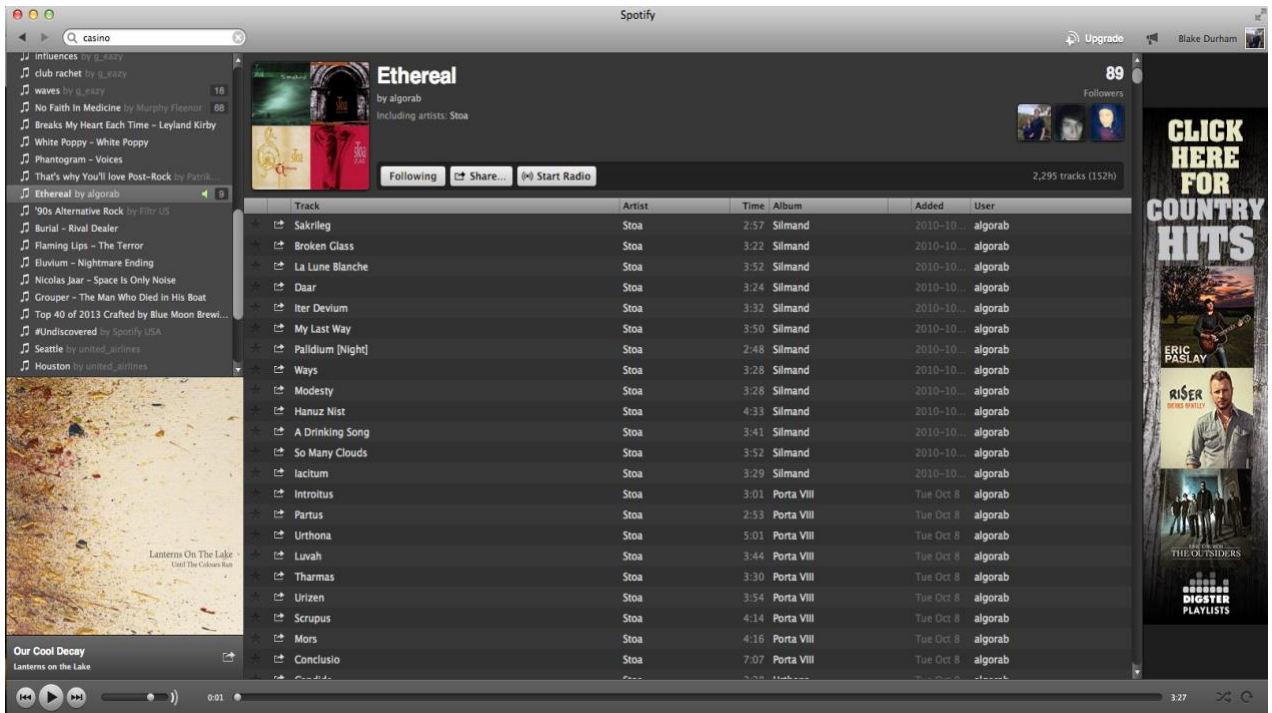


Figure 7. Spotify UI circa early 2014.

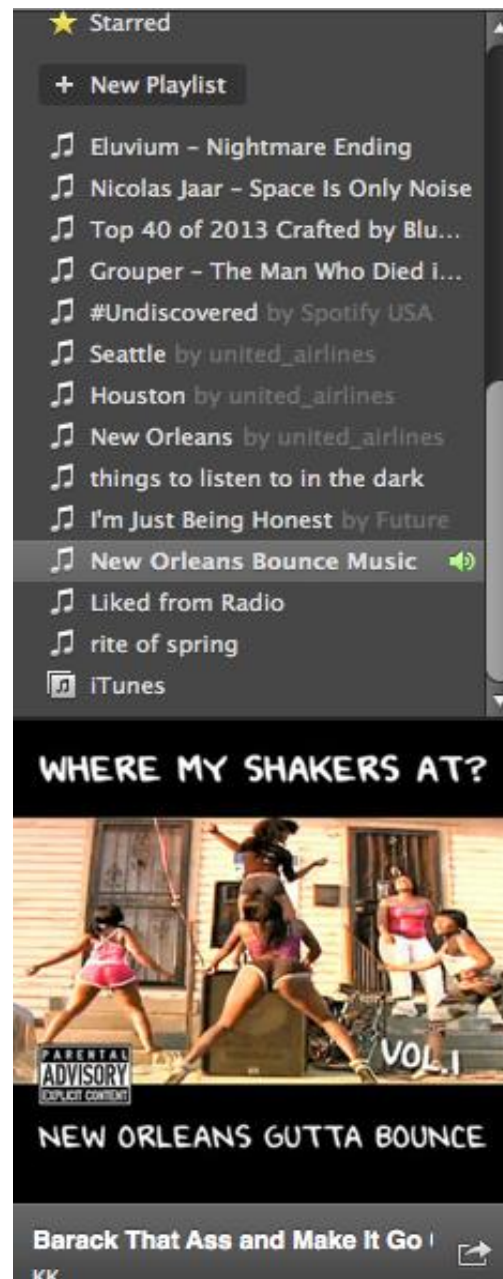
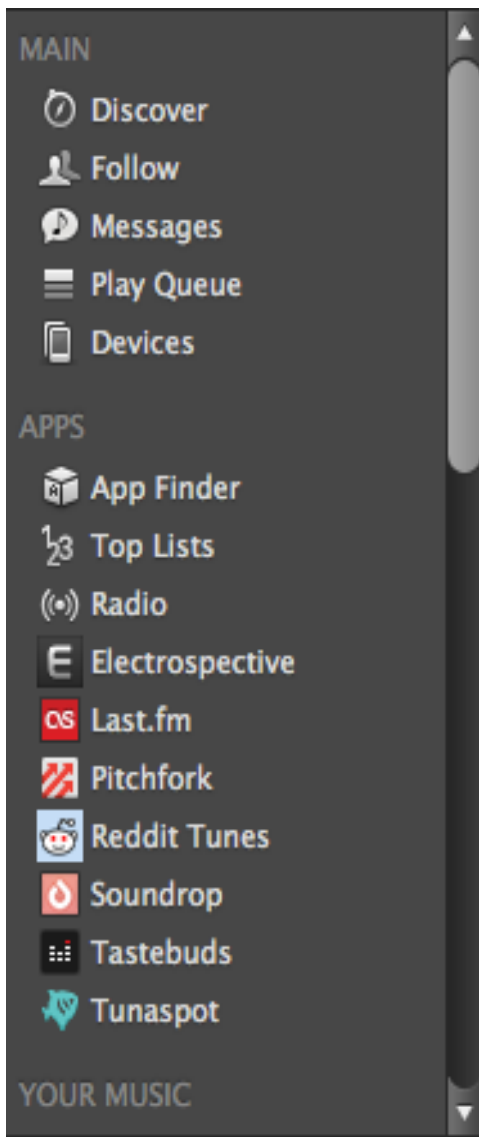


Figure 8. The sidebar, split into two columns, circa early 2014.

The interface is divided horizontally into 3 main visual components. The left side of the window, called the ‘sidebar’, functions as the navigation menu. The ‘Main’ menu of the sidebar contains the key features of the application: at the time of this documentation, it holds Discover, Follow, Messages, Play Queue, and Devices. As new features are introduced and other are deprecated, renamed, or folded into other components of the application, this menu updates to reflect the most current and emphasised features.³¹ At launch, the application starts up on the Discover page, a feature that combines personalised music suggestions, based on recent listening history, with selections of the consumption trends of the user’s ‘friends’ and ‘followed’ accounts. Suggestions are displayed in a tiled grid, reminiscent of popular ‘image pinboard’ social networking site Pinterest. Discover, being one of Spotify’s key points of product differentiation, is redesigned more frequently than any other aspect of the service.

³¹ As of late 2016, the Main menu has been reduced to ‘Browse’ and ‘Radio’.

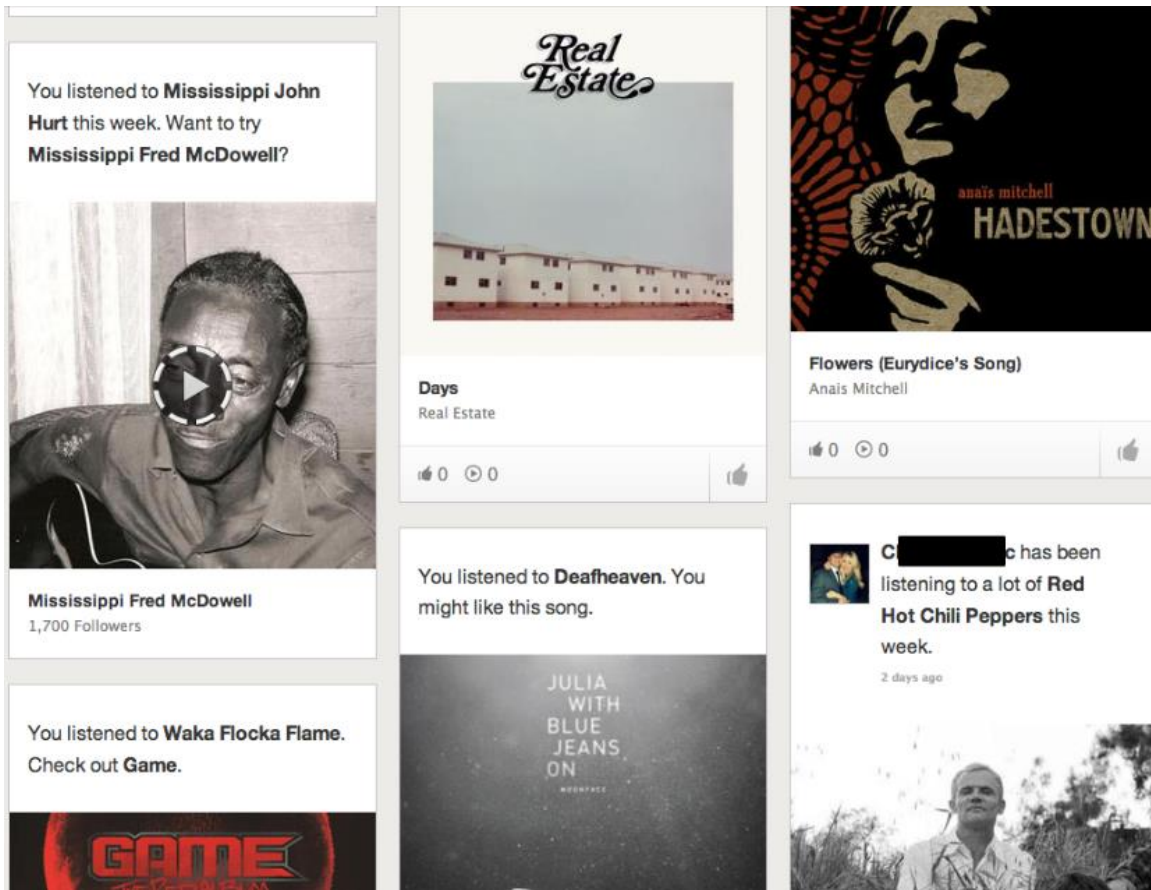


Figure 9. The Discover page, circa early 2014

The user's 'Friends', one of whom is depicted listening to the Red Hot Chili Peppers in the figure above, are drawn from the social network of the user's linked Facebook account, if connected.³² The 'Follow' system, which is also integrated into Discover suggestions, also allows for users to connect socially with other users outside of Facebook integration, but is primarily used to as a non-reciprocal promotional system for 'verified' accounts. These verified accounts are typically artists, record labels, but also highly popular playlist curators, known as 'tastemakers'. 'Following' one of these accounts leads to users receiving notifications that the account has updated a public

³² Spotify announced a corporate partnership with Facebook in 2011, but the details of the negotiation process or the financial arrangement have not been made public.

playlist or uploaded new music to Spotify. The ‘Messages’ function offers the ability to ‘share’ songs with others in a non-synchronous format, similar to Facebook messages. Messages are not designed in a traditional ‘chat’ or ‘private message’ format, as conversations can only be initiated by sharing a song. To ‘share’, the user selects the desired song, opens the ‘options’ menu, selects ‘Share’, and then chooses the ‘friend’ from the list of connected Facebook contacts. Once a song has been shared, text comments between the two accounts can be sent back and forth. If a user does not connect their Facebook account to Spotify, the capabilities of these ‘social’ features are significantly curtailed. Users without a linked Facebook account can only be found by their user name—for instance, ‘blakedurham’—through the use of undocumented search syntax: ‘spotify:search:[user name]’. However, most users are generally not aware of these advanced search queries, and as such, non-Facebook informants report very little engagement with following or sharing songs with friends.

Playlists and Media Management

My first interview is with my key offline informant, MF, a 26 year-old farmer, music collector and highly involved Spotify user. I ask him to explain his understanding of Spotify, and allow him to demonstrate his curation, collection, and social practices. Observing MF’s curation and consumption practices, my first finding is that playlists are the core organizational unit of Spotify. He immediately offers valuable insight into his understanding of how Spotify ‘wants’ users to use the service — its shaping of consumption practices — versus his idiosyncratic method, which involves resisting personalized recommendations and constructing a library out of ‘nested’ playlists, which

I describe in further detail in Chapter 8 (Akrich 1992). This self-defined library illustrates the organizational labour necessary to assemble a personal collection when opening a new account with Spotify. MF explains that he adds full albums to a series of ‘library playlists’, which are not intended for browsing or listening, but simply as a mechanism for adding the files into his personal Spotify collection. Playlists are limited to 10,000 tracks, so MF has a total of 4 library playlists. Drawing from these library playlists, MF curates dozens of playlists intended for particular consumption purposes. MF’s playlists include activity-themed options, such as ‘Work’, and also ‘friends’ playlists, intended for co-present listening sessions and curated to appeal to the tastes of particular individuals. MF presents me with a short playlist titled ‘Blake’ on our first interview sessions, drawing on our common affinity for country music with selections including Willie Nelson and Townes Van Zandt.

What is most striking about MF’s ‘library playlist’ media management method is that it prefigures a central feature of Spotify, ‘Your Music’, a music collection utility implemented in early 2014. A more powerful music collection utility was previously the most common feature request from users on Spotify’s support website. A ‘plus’ sign now appears next to all songs or albums found in public playlists or search results, and clicking it once adds it to the user’s Your Music collection. By default, Your Music displays a tiled grid of artist images, rather than the column list format of playlists. Clicking the artist image displays the list of songs or albums saved.

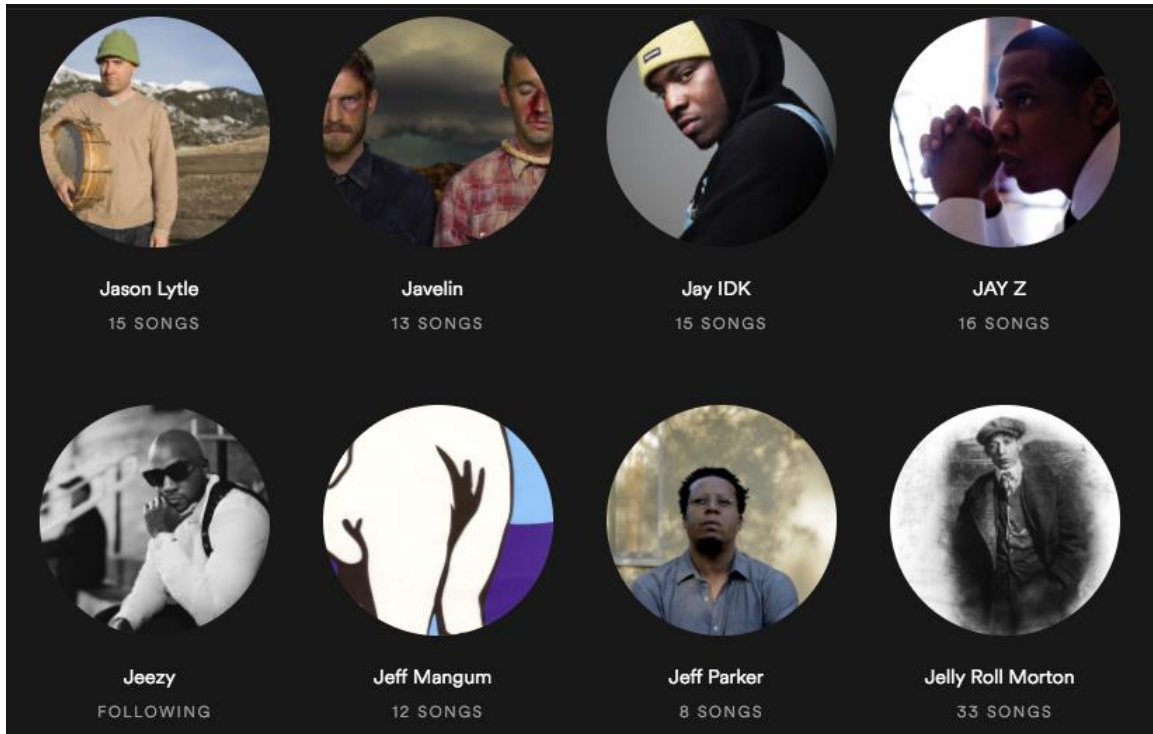


Figure 10. An excerpt screenshot of a Your Music collection, circa 2016

As later explained to me in an informal conversation with a Spotify developer, the Your Music system is itself an adaptation of Spotify’s playlist code. In other words, Your Music is best understood as a visual redesign of a ‘library playlist’. For this reason, Your Music is limited to 10,000 songs, a particularly common complaint among informants. This arbitrarily technical limitation on ‘Your Music’ supports Chapter 9’s consideration of the governances of circulation.

Streaming Consumption and Circulation Practices

While attention to the specificities of Spotify’s technologies is important and productive, here I introduce my findings regarding the impact of its rentier streaming model on music ownership. As I explore further in Chapter 8, the business model of Spotify reshapes notions of music ownership for its subscribers, in that music objects are

not owned, but accessed on a rental basis. Numerous informants, especially those who consider themselves music collectors, express anxiety over the possibility of losing access to their accounts. NT, a vinyl collector and former user of Spotify, explains that his decision to abandon Spotify is due to feeling no personal connection to the music he saves to his account. Comparatively, NT finds vinyl records, cassette tapes, MP3 files, and even unlicensed CD copies to possess a greater sense of materiality, and therefore, affords closer aesthetic connections to the work it contains.

However, the ephemerality of Spotify is also perceived to afford new approaches to collecting and consuming music. As I note in Chapter 5, the economic ‘costs’ associated with the ownership of music, whether purchasing a record or incurring the cost of a download within the ratio system on Jekyll, are sometimes understood as a barrier to the discovery of new music. By removing the ‘cost barrier’ impeding access to music consumption, Spotify can afford users a more exploratory, less calculated approach to ‘collecting’ music. My informant GS, a highly knowledgeable and influential playlist curator, speaks about browsing and discovering new music on Spotify in a manner similar to a collector ‘digging’ through crates of vinyl records. He begins by listening to a few seconds of dozens of new releases in a single session, saving those that are of interest to a playlist to explore further. After this period of discovery, GS classifies each of these songs into their respective genres, such as ‘indie rock’ or ‘pop’, and adds them to a series of weekly updated playlists, some of which are followed by thousands of other users.

Indeed, a number of Spotify informants report using streaming to find new music, supplement existing collections, or simply for listening in moments where other modes of music consumption are less convenient. Prior to fieldwork, I conceived of both Jekyll and

Spotify as totalizing platforms of music circulation, in which users are locked into only using one platform in their digital consumption practices. One of my early informants, MM, strongly contradicts this finding, as she seamlessly moves between iTunes, Spotify, Pandora, vinyl records, and satellite radio. While Spotify is the primary music consumption platform for MM while at work, her decision-making in other contexts is sometimes due to an affinity for particular playlists or radio stations that are hosted only on one platform. At other times, MM reports an almost arbitrary decision-making process, which she explains as ‘the first thing I think of, I put on’. The multiple practices in which Spotify is integrated into other platforms of music consumption and circulation are some of the most surprising findings of this research, and strongly inform my analysis of polymediality in Chapter 5.

I recognize that emic conceptions of ‘using Spotify’ can mean substantially different experiences, depending on individual practices, subscription level, device, and country of origin. In the course of fieldwork, I access the Spotify streaming library from four different countries — the United Kingdom, the United States, Canada, and Sweden — and take note of how region affects the streamed library. A personal vignette is of interest here. While on a visit to Spotify headquarters in Sweden, I saved an album to my collection: *Just Like the Fambly Cat*, a 2006 release by indie rock band Grandaddy. Upon returning to the United States, I noted that the songs from the album are no longer available to stream, despite the record and album art still appearing in my account’s Your Music collection. I used an unofficial lookup service to determine the regions in which the album is licensed for Spotify distribution. The search results showed that *Just Like the Fambly Cat* was available in most of Spotify’s territories, but not the United States,

despite the rest of Granddaddy's catalogue being available in all of Spotify's regions. I contacted Jason Lytle, the songwriter and bandleader of Granddaddy, to inquire why this specific album was held back from distribution in the US, and he responded that he was totally unaware that the record is not available worldwide. International copyright regulations do lead to a highly complex legal environment, but even copyright holders often find the regional availability of music confusing or incorrect.

I encounter examples of differences or exclusion such as this constantly throughout research. Informants using a Windows Phone or Linux frequently complain that the lower priority of their application results in a lesser user experience, missing many of the features and stability of the Android, iOS and Desktop apps. New features are also not evenly distributed, as Spotify's 'agile development' style of software development means that Spotify mainly tests new features on select markets, regions, and user groups, rather than a conventional opt-in Beta program. A small subset of Android users, myself included, receive an experimental social feature titled the 'Friend Feed', an adaptation of the Desktop function of the same name described earlier. Despite its popularity with several informants, the project is abandoned after several months and removed from our account without warning in a later software update.

The Socialities of Spotify and the ‘Spotify Community’

Music brings us together

That's why Spotify is so social. Share music on Spotify, Facebook, Twitter, your blog, anywhere. You can also get closer to the friends, artists and trendsetters who turn you on to great music. Find out what they're listening to right now.



Figure 11. ‘Music brings us together’, a banner on Spotify.com (4 January 2014)

During fieldwork, I conceive of Spotify users as constituting a circulatory public, in that participating in Spotify consumption involves curating music selections that in principle shape the collective as a whole. However, I quickly recognize that the social spaces of Spotify, unlike Jekyll, do not bear traces of widespread communality. Indeed, In Chapter 7, I argue that Spotify’s simulation of participatory circulation networks further individuates consumption, mainly because its musical publics are instrumentalised in the service of individual listening experiences. I further contend that Spotify is an individuated platform for music consumption, as its design predominantly shapes listening experiences that are geared towards personalized recommendations, not communal consumption. Spotify is highly attuned to individuals’ affinities and tastes due to the platform’s appropriation of its users’ listening data. Nonetheless, I document several intriguing social practices, both within and outside of the Spotify application. I also find the crowdsourcing of customer service a particularly rich field site for understanding Spotify ‘community’ and streaming social practices.

The public playlist system engenders what I consider a multitude of musical

publics, particularly those bound together by genre and shared musical affinities. As I address in Chapter 8, the curatorial labour invested in the creation of public playlists in Spotify is quite impressive. Public playlists can be found by searching various keyword types, reflecting differing styles of folk musical taxonomy. Common terms for naming public playlists include genre titles (e.g., ‘dancehall’), aesthetic descriptors (e.g., ‘ethereal’), mood descriptions (e.g., ‘chill’), or activity types (e.g., ‘lifting’).

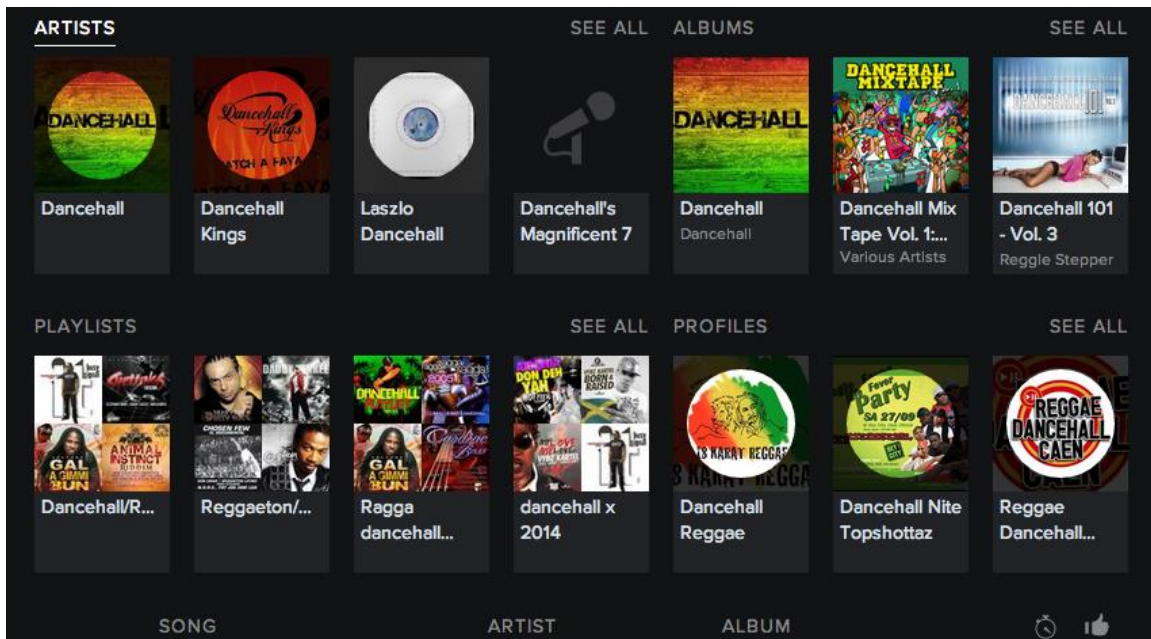


Figure 12. The top results for the keyword search ‘dancehall’, with the most popular public playlists appearing in the bottom left.

Unlike the Jekyll genre communities I examine in Chapter 6, the actual social interactions between individuals on Spotify are mostly limited to these public curatorial practices and following ‘similar’ users. Soundrop’s musically-themed chat ‘listening rooms’ offer the most similar point of comparison to Jekyll genre communities.

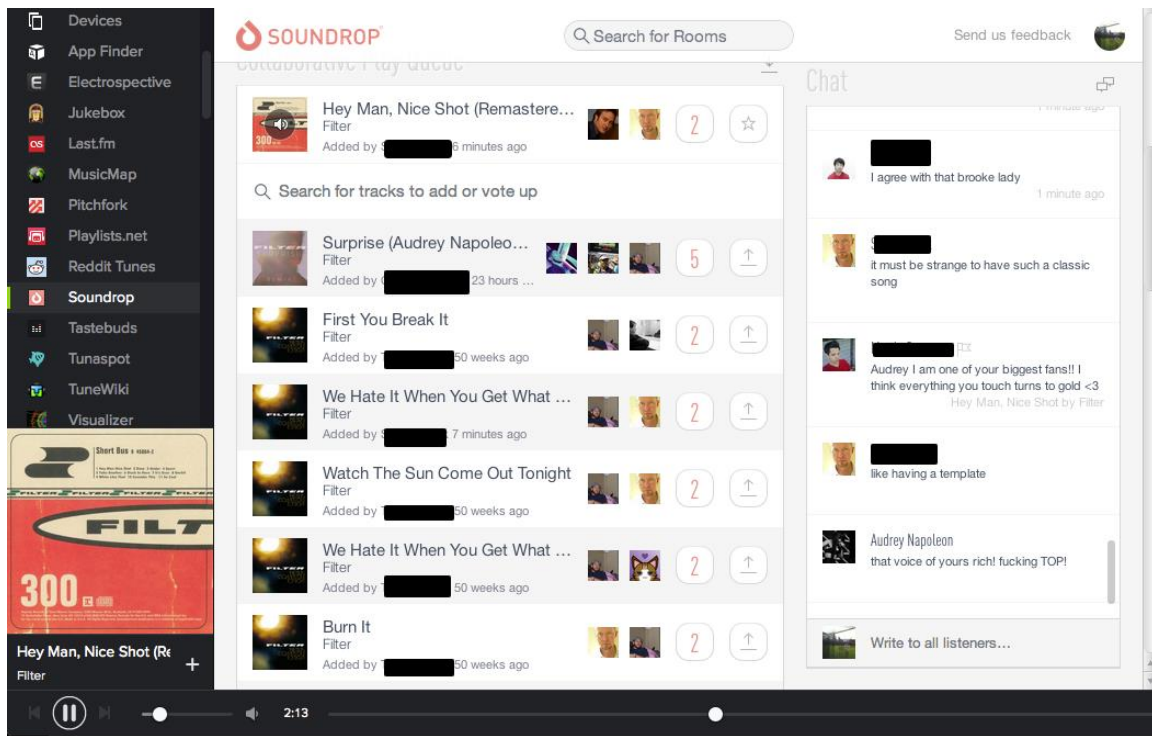


Figure 13. A Soundrop simulisten chat session dedicated to the alternative rock band Filter, with discussion between members of the band and fans.

Soundrop, an independent company whose listening rooms are hosted within the Spotify desktop application, offers several dozen genre-specific public listening rooms allowing users simultaneously to listen to and discuss music. Soundrop rooms also offer opportunities for audiences to co-listen with artists in special listening sessions where artists answer questions about their work with fans. Most public rooms host between ten and three hundred listeners at a given time, and users collaboratively vote on tracks in order to select the next song in the queue. I observe a limited amount of socialization between users within the public rooms, but it is the private rooms that appear to be the most vibrant social spaces within the Spotify ecology. This synchronous format of co-present musical listening and discourse between friends is a unique sociomusical experience, one in which I engage in with informants multiple times throughout

fieldwork. However, the Soundrop rooms are discontinued, due to Spotify's deprecation of all third-party apps within the Desktop application, in late 2014, despite being a highly valued feature for my informants.

Some of Spotify's most complex social arrangements can be located within a crowdsourced technical support website. Customer service for Spotify is available through three methods: On Twitter, through email correspondence, and an online forum, called the 'Spotify Community'. The Community is based on the Lithium platform, a product referred to as 'social customer experience management software' by software development company Lithium Technologies. The Spotify Community serves as a form of frontline customer service, technical support, quality assurance feedback, and market research. The forums are directed by Community Managers – employees who control its social and technical environment. While Spotify employees do oversee the forums and are available to answer certain sensitive requests, the 'Rock Stars'— a staff-selected group of the most active and involved members—are expected to answer the majority of incoming questions from other users.

I begin observing the Spotify Community forums as a way into understanding the problems average Spotify users face in their everyday streaming practices. As the first line of customer support is the Community forums and the crowdsourced knowledge it proffers, thousands of new users join each month to ask questions and receive assistance. The majority of questions involve billing or technical issues, in which roughly 20 different known issues represent well over half of all posts. For instance, the process of registering for the Premium student discount is often confusing for new users. Requests for refunds due to duplicate charges, often due to the user unknowingly creating multiple

accounts, is also a common issue. Common technical support issues include problems with local and offline files, mobile apps using excessive amounts of cellular data, and slow loading times when opening the application.

My involvement in the Spotify Community forums evolves into three years of fieldwork, stemming from the richness of participant-observation of the suggestion and requests board, called the 'Idea Exchange', and the relationships I cultivate with some of Spotify's most loyal and knowledgeable customers. I quickly recognize that the forum format appeals most to Spotify's more technically savvy audience, and as such, Community users are not a representative sample of Spotify's publics as a whole. However, as some of Spotify's most active users, Rock Star users are a useful point of comparison to Jekyll participants. Both engage in a form of labour I call 'circulatory maintenance', as I explore in Chapter 8. Over the course of fieldwork, I cultivate several important informant relationships with these dedicated Spotify users. I also observe numerous genuine social connections between participants, particularly in a chat room established to facilitate discussion between Rock Stars. This material nuances my analysis of Spotify socialites in Chapter 7, as it demonstrates that the social spaces within the Spotify ecology, despite their simulated nature, can still engender social relationships unmediated by the playlist format.

My observation of the 'Idea Exchange' board becomes a surprisingly useful methodological approach. User's feature requests offer some of the clearest insights into the desires of Spotify users and their visions of alternative arrangements for streaming services. Over the fieldwork period, I participate in the Idea Exchange in order to understand the types of common requests Spotify receives and how their developers

interpret, prioritize, and develop requests. These materials inform my understanding of how Spotify and its users mutually mediate the other, particularly my analysis of product cycles in Chapter 7.

Many of the dozens of feature requests posted to the forum are economically or technically infeasible, such as the frequent request to make Spotify completely free, or to develop applications for highly unpopular platforms. However, others suggest highly inventive potential features. Some of the most intriguing posts request further control over the sonic materials of the streamed library, such as ‘DJ tools’ (e.g., playback speed control, mixing multiple songs) or ‘remix tools’ (e.g., a digital audio workstation app within the Spotify ecology that allows users to manipulate songs from the Spotify catalogue). The most common type of request is for Spotify to expand its international scope to countries such as India, Japan (a request fulfilled in 2016) and China. While many of these ideas are rejected or do not receive enough community support to warrant an official response, Spotify has implemented several hundred of these requests. My informant MS, an early member of the Spotify Community’s and one of its most active users, originally became involved in the forums by posting an idea for a ‘repeat one’ function. Spotify’s repeat button, located in the bottom right hand corner of the playback bar, allows a playlist to infinitely repeat. In 2012, MS requested a similar feature for repeating individual songs. Despite originally receiving a ‘Not Right Now’ response from staff, MS’s idea received over a thousand votes, and was developed and implemented in early 2014. In a discussion between Spotify CEO Daniel Ek and MS, Ek expressed surprise at how popular the idea became, explaining that Spotify developers did not anticipate how many users desired this feature.

The Community forums also contain a significant amount of musical discourse. Hundreds of playlists are posted each day in the Music Discussion forums, with a particular focus on discovering and publicizing new releases and emerging artists. As playlists with many followers appear higher in the Spotify app search results, the primary challenge for curating a popular playlist is in attracting the first several hundred followers. As such, many users attempt to ‘promote’ their playlists within the Music Discussion forums, with the intention of increasing their follower count. In contrast, others are simply seeking a space to discuss music with other listeners. After encouragement from Spotify staff, several popular playlist curators and musicians join the discussion boards.

I also discover that many Spotify Community users listen to a stunning amount of music on Spotify, in some cases as much as fifteen hours a day. In 2014, Spotify launches a utility called ‘Your Year in Music’, which analyses usage data to show users their amount of time spent listening to Spotify, their most listened songs and artists, and other data, reminiscent of popular music consumption statistics website last.fm. In 2015, MS listens to 348,000 minutes of music, explaining that he even ‘listens’ to music while sleeping. Informants such as MS are unique case studies, in that their affinity for intensive amounts of music consumption approaches Spotify’s perceived affordance of ‘infinite’ consumption. It also provides evidence to support my arguments regarding user loyalty in Chapter 10, in that high investments of time in both Jekyll and Spotify translates into particularly loyal and dedicated participants.

Conclusion

This chapter has presented the core ethnographic materials of my fieldwork. Within both field sites, I have outlined the primary musical functions and features of Spotify and Jekyll, beginning my illustration of the basic experience of everyday music consumption on both platforms. I have also drawn out fieldwork materials to support the key arguments of this thesis, which are presented in the following seven chapters. Within Jekyll, I have demonstrated the complexity and richness of its sociomusical formations, showing that they are closely governed and are animated by music exchange and circulatory labour. For Spotify, I have shown that its socialities, despite being limited and ersatz in nature, are still capable of engendering social connections. Spotify's playlist curators and crowdsourced customer service participants show how circulatory labour is essential in assembling curated musical selections. I have also put forward evidence to nuance understandings of music consumption and circulation, showing how circulation and consumption have become immanently linked. The distinct articulations of music consumption and circulation on both platforms represent one of the key points of comparative analysis of the thesis.

In the next chapter, I examine the genealogies of digital music circulation, showing how the histories of Spotify and Jekyll are interrelated, and how these factors shape current consumption and circulation practices.

Chapter Four: Genealogies of Circulation

Remembering Simondon's meditation on the technical object, we are not only referring to the technical object itself, but *the genesis of that object; the techno-historical development of its functioning.*

(Sockanathan 2011, 169; emphasis added)

In this chapter, I focus on the historical development of digital circulation and file-sharing cultures. The genealogies of the sociomusical assemblages that constitute Jekyll and Spotify are of primary importance to the central arguments of this study. When we speak of evolving extralegal networks of music circulation, or streaming as a new mode of circulation and consumption, to what extent are the specificities of Jekyll and Spotify shaped by their historical predecessors?

The chapter is not intended as a comprehensive history of file-sharing, digital computing, music consumption, or online socialities. Influenced by media archaeology (Fuller 2005, Fuller and Goffey 2012, Parikka 2007, Skågeby 2015, Zielinski 1999), I offer a historical account of access-oriented streaming subscription services and 'private' unlicensed music circulation, in order to provide context and help explain how Jekyll and Spotify take the form that they do. This approach is derived from Georgina Born's work (2005, 2010b) on the mutual mediation between technical objects and subject. First, I present historical context for both platforms, including early file-sharing networks and music subscription services. Following Born, I contend that the way each subject encounters musical-technical objects must be understood in terms of their own personal history as it conditions their subjectivity. In the second half of the chapter, I have presented three characteristic examples that point to common kinds of engagement with

Spotify and Jekyll. This aligns with Adorno's provocative sociological approach to analyzing music consumption (Adorno 1976). I take Adorno's commitment to the dialectical relationship between musical subjects and objects seriously, arguing that the histories of both subjects and objects shape Jekyll and Spotify in the present.

The dominant narrative of digital music circulation's history begins with the development of digital audio compression technology, namely the MP3 (Sterne 2012), the widespread adoption of Napster and its eventual downfall (Giesler and Pohlmann 2002), and then the rapid multiplication and diversification of peer-to-peer technologies. These are typically classified into Napster-like P2P protocols (e.g., Fasttrack, Gnutella), BitTorrent file-sharing (its own mutations and varying levels of anonymization and decentralization typically ignored), and the multiple client-server file-sharing applications referred to as 'cyberlockers' (Karaganis 2011). In terms of licensed circulation, circulatory historiography often begins with the launch of iTunes in 2001, downplaying its subscription-based and paid-download predecessors (Morris 2015).

My attempt to draw out the precursors in this ecology of circulation aims in part to destabilise assumptions about the primacy, novelty and inevitability of current arrangements. I want to demonstrate that the predominant features that characterise Spotify and Jekyll — an access-based music subscription service and a highly rationalised 'private' mode of unlicensed circulation — are not unique to these platforms. Media archaeology's primary influence here is the importance of studying media relationally. Within a relational analysis, the innovations and novelty of new media platforms can be studied critically against current and obsolete technologies, illuminating their predecessors and genealogical entanglements (Chun 2008). The vignettes I offer

situate Jekyll and Spotify relationally, showing the dynamic interrelations between the licensed and unlicensed spheres through intermedial histories, as well as their individual precursors. The licensed and unlicensed sphere must be seen in light of each other, but also cannot be reduced to one another: their histories converge and depart from one another.

I also recognize how music circulation and consumption practices are influenced by individual histories and broader technological genealogies. Andrew Whelan's Deleuzian historiography of peer-to-peer exchange (2009) as it relates to the breakcore genre also aligns productively with my non-teleological approach. Likewise, Jeremy Morris' (2015) historical account of the commodification of digital music takes a non-linear approach, drawing together a multitude of industry figures, initiatives, and actors in his portrayal of the 'formatting of culture'.

The key finding of this chapter is that Jekyll and Spotify, which seem to be absolutely separate, must be understood as defined implicitly in relation to one another. This historical analysis offers insights into each platform's social, technical and musical makeup, offering compelling historical evidence to explain how both platforms developed into their current arrangements.

The Furcating Histories of Circulation

Scholars of file-sharing and digital circulation have produced a significant body of historical literature that studies these modes of exchange in relation to the development of the internet. Often, these histories depict a linear aggregation of platforms of circulation over time, with key dates of technologies (such as product launches and

shutdowns) marked in a timeline that attempts to denote the transitions (see Burkart 2014a, 395). However, as I show throughout this chapter, such models are necessarily incomplete, as they fail to capture the deeper genealogical influences. Most importantly, it fails to show that earlier technologies (outside of the named predecessors) influence contemporary platforms. In this section, I engage with several of the most relevant of these works, in order to identify the most salient genealogical vectors.

Jonas Andersson Schwarz (2014) has published perhaps the most comprehensive historical account of unlicensed music circulation, and my account of Jekyll and Spotify's predecessors relies significantly on his approach. I want to adapt and expand upon his 'nested historiography' of file-sharing, reading music and its sociotechnical movements as continually referring back to older technologies, distribution models, and social arrangements (a concept closely linked to the notion of 'remediation' [Grusin and Bolter 1999]). File-sharing, Schwarz argues, is 'foundational to the Internet, since practically all data networking [. . .] relies on the free and unrestricted copying of files (Schwarz 2014, 92). This is an inescapable truth of digital ethnography: the study of digital cultures is inherently the study of data exchange practices. Schwarz suggests that the adoption of technologies of circulation should not be reduced to epochal moments in time—i.e., 'The Napster Period', 'The Pirate Bay Period'—as these alliances of users and protocols take place non-teleologically; early file-sharing technologies, namely Usenet newsgroups and Internet Relay Chat (IRC) servers, remain vibrant components of the current file-sharing ecology, mutating and continuing in response to sociotechnical (and I contend, governmental) fluctuations, without wholly capitulating to the supposed superiority of new technical infrastructures. He notes how optimistic or technologist

views of the internet, such as Oram 2001, described it as an ‘assemblage of many smaller networks’, essentially depicting a peer-based node system. However, dating back to the earliest implementations of the World Wide Web, client-server models (the technical basis of streaming services such as Spotify) were actually commonplace.

Schwarz also attempts to link this history of file-sharing with a consideration of the resulting social shaping of technology. He proposes four ideal types of contemporary file-sharing practice, which influence historical imaginaries of digital music cultures. The first type is the ‘interpretative active audience’ of highly engaged and informed consumers; second, the ‘hacker ethos’ believer; third, the ‘prosumer’, whose music production and consumption practices converge into each other through file-sharing; fourth, the ‘techno-entrepreneurialist’ (ibid., 89-92). These types, as reductive as they might seem, give insight into several characteristic types of users in Jekyll and Spotify. I can identify multiple informants for each type who engage in the digital practices that Schwarz attempts to encompass. Throughout the thesis, examples of informants engaging in rich musical literacies (ideal type #1), free culture advocacies (ideal type #2), prosumer music production (ideal type #3), and user-generated programming projects (ideal type #4) proliferate. While not comprehensive, these historically-engendered types do characterise many of the lively sociomusical practices enacted within my field sites.

However, I depart from Schwarz’s periodisation of file-sharing platforms: he considers Napster and its contemporaries Gnutella, Freenet, and MP3Get as ‘first generation’, Direct Connect as a short-lived second generation, and BitTorrent launching the dominating third generation, with the emergence of cyberlockers and the gradual downfall of The Pirate Bay signaling the beginning of the fourth generation. While this

periodisation has much to recommend it, it could be misinterpreted to argue precisely against the ‘nested historiography’ Schwarz proposes. Schwarz appears to argue that peer-connected data transfer is a Napster-originated phenomenon: it is sequential in audience makeup and infrastructure, and the development of new technologies determines the nature of audience exchange relationships. In response, I rearticulate the central thesis of this chapter: that while Spotify and Jekyll do offer exciting, unique and previously-unseen modes of music consumption, circulation, and access, the broader contours of their music and social practices are thoroughly historically informed. In the case of Jekyll, music audiences have long exchanged music works, developed hierarchical relationships and ideologies, established markers of prestige, and yet experienced the resulting social formations as deeply beneficial and aesthetically stimulating. In the case of Spotify, music’s commodity forms have long been tied up in restrictions on consumption, with attempts to control derivative uses, as well as the location, format and structure of digital music experiences. Similarly, the music industries can be said to have engaged in earlier ‘rent-seeking’ through their multiple attempts at subscription models, DRM-encoded digital downloads, and restrictive streaming services: as Burkart and McCourt 2006 clearly demonstrate, the Celestial Jukebox is a long-foreseen end goal of the recorded music industry—its apotheosis, not a recent capitulation to market forces.

Schwarz’s historical account of music circulation, while exemplary in several capacities, can be enriched by paying attention to alternative media histories that have participated in shaping digital cultures. Kostas Kasaras (2002) traces the historicity of sonic mechanical reproduction back to Gutenberg’s 15th century printing press, as new

technology dramatically shaped the circulation of knowledge and the development of a market economy for intellectual property. Following music reproduction after Edison's phonograph, Kasaras argues that new technologies are typically appropriated by existing systems, ultimately reinforcing, rather than dismantling, the relations between artists, audiences, and intermediaries. Along similar lines, Balázs Bodo (2011) offers an abbreviated history of 'pirated' books that dates back to the very beginnings of print media, with several intriguing insights, from the expansion of the public sphere to the circulation of knowledge among previously excluded groups. Chief among these insights is his acknowledgement of the ongoing mutual mediation of 'legitimate' and 'illegitimate' markets, particularly in regards to technological and economic expansion. He describes processes of 'pirates' identifying market inefficiencies, an inevitable reactionary response by regulatory agencies (state power being utilized to protect property ownership interests), and the eventual incorporation or appropriation of the techniques and strategies into legitimate business models. His consideration of early book circulation suggests that some of the tensions between legal and extralegal exchange are much older than often assumed by historians of digitality:

But a longer historical lens suggests that the current crisis of copyright, piracy, and enforcement has much in common with earlier periods of change and conflict among cultural producers. From the early days of the book trade in the fifteenth century, cultural markets were shaped by deals within the publishing trade and with political authorities over who could reproduce works and on what terms.

Bodo 2011, 399

In the following sections, I will address several of Spotify and Jekyll's most significant genealogical predecessors, engaging in each case both theoretically and historically with the existing literature on each mode of exchange.

OiNk, Private BitTorrent Trackers, and Alternate Vectors of Circulatory Sociality

Of all defunct file-sharing services, none is more essential to my historical analysis than Jekyll's predecessor, OiNk. OiNk was instrumental in moving extralegal file-sharing away from unregulated and anarchic systems like Napster into access-restricted darknet services. This early private tracker prefigures the intensely regulated music publics embodied by Jekyll and the private tracker scene, as well as its simulation in the licensed streaming realm via Spotify. Oink's Pink Palace, founded in 2004 with a particular focus on music, was the first major private BitTorrent tracker,³³ and popularized the practice amongst private file-sharing networks of requiring an invitation from an existing user in order to register. Before being shut down by the IFPI in October 2007, OiNk had over 175,000 accounts, a user base size that no other private tracker has since reached, although Jekyll has far exceeded OiNk in terms of the total amount of circulated music. Jekyll is widely credited as the immediate successor to OiNk: both its founder and a significant percentage of its original user base were OiNk members, and the site was founded only days after the termination of OiNk itself. As such, Jekyll's structure, operating practices, and communal ethos are highly derivative of the OiNk social formation.

Andrew Sockanathan's PhD thesis examining OiNk is a key source of historical and theoretical materials, informing my formulation of the private tracker scene: many

³³ Although the once-popular, now defunct tracker Demonoid is often called the first private tracker, in that it required account registration to access the torrent index, it would not be considered 'private' by the current private tracker scene: it offered 'open registration', allowing new members to register without an invitation or any form of interview process. This is revealing for what the term 'private' emically means within this scene: the operative trait of 'privacy' for private trackers is that individuals are 'vouched for' in some capacity before being permitted to join.

sociocultural practices he describes taking place within OiNk are directly reflected in my own findings. Sockanathan documents an intense prestige economy and a highly regulated sociality, best exemplified by the rules governing the so-called ‘cute’ aesthetic of the site: so-called ‘avatars’ on user profiles and forum posts were required to conform to the site’s kitschy, pastel-dominated aesthetic. Sockanathan argues this constituted a rejection of ‘the visual seduction techniques common to commercial web design’ and promoted a ‘twee’ countercultural aesthetic (Sockanathan 2011, 269). However, it can also be seen that OiNk’s dismissals of commercial aesthetics—its articulation of a resistance to the growing commodification of online music economies—excludes alternative forms of creative production (i.e., non-commercial and yet ‘uncute’ avatars). Likewise, Jekyll governmentality has inherited similar dynamics of exclusion and negation: much in the way that OiNk enforced ideologies of ‘cuteness’, Jekyll will be shown in later chapters to strictly regulate permissible participation within the tracker, shaping subjectivities to an often surprising extent.

A point of particular interest for this chapter is Sockanathan’s perspective on the genealogy of private trackers, which departs from the standard histories of peer-to-peer file-sharing cultures.³⁴ He writes:

³⁴ At this point, it must be noted that the TCP/IP protocol, the foundation of what is now understood to constitute the Internet, is also the animating model of P2P exchange. That is to say, TCP/IP allows for end-to-end transmission: data passes through nodes, but these intermediaries do not manipulate the content of the message. This can be contrasted with the other most impactful protocol system underlying Internet connectivity, DNS: DNS system is distributed yet hierarchical, an example of a technical infrastructure that mixes client-server and peer-to-peer computing concepts to more simply identify resources available on the World Wide Web. I frame this simplistically as client-server and peer-to-peer, not unproblematically to accept this binary, but to analyse further the dialectical relationship of these two models in the history of digital music circulation. The citation of peer-to-peer versus client-server relations recurred throughout

[. . .] We [must] avoid the mistake of situating the individuation of BitTorrent and OiNK solely within the techno-history of P2P. The point here is that both BitTorrent and OiNK *did* recondition the functioning of P2P technology, but *not* expressly through taking elements of the previously existing P2P environment and improving upon them. Rather BitTorrent culture, particularly the private, invite-only manifestations of it such as OiNK, largely reconditioned these elements with the components of an organisational impulse derived from another techno-historical tradition. The seeds of this tradition were sewn [. . .] before Tim Berners Lee invented the World Wide Web in 1989, in the development of the hardware and software hacking, cracking and not-for-profit distribution movement that eventually became known as ‘The Scene’. [. . .] [The] private BitTorrent culture took the spirit that was latent in this specific constellation of hacking, cracking and file distribution and made it manifest amongst a new breed of internet-savvy users who did not identify themselves as technology enthusiasts, hackers or crackers, but were able to identify with the idea and practice of decentralisation, active interaction and the free flow of information that the preindividual environment of BitTorrent afforded them.

Sockanathan 2011, 170

Sockanathan traces the lineage of file-sharing and ‘The Scene’ through the early, pre-internet history of computing, primarily drawing on histories of early hackers, tinkerers, and crackers. Bulletin Board Systems (BBS) were popularized in the 1980s, foreshadowing what would come to be called ‘forum culture’ in the late 1990s: BBS were personally-hosted systems that offered relatively simple, text-based spaces for members to engage in computer-mediated-communication and build what came to be known as ‘virtual communities’.³⁵ He connects the pre-history of BBS and the 1979 release of the XMODEM protocol (allowing for files to be transferred over telephone lines) to the 1973 *Community Memory* project of Lee Felsenstein.³⁶ *Community Memory* connected a public terminal, located in a San Francisco record store, to a nearby mainframe, which afforded a direct peer-to-peer communication system, taking place outside the control of

my fieldwork, even in my own, simplistic explanation of the difference between Spotify and Jekyll.

³⁵ See Rheingold 1993, 181-204 for an analysis of BBS sociality.

³⁶ For more on the ‘prehistory’ of Internet sociality, see Ziewitz and Brown 2013.

intermediaries (Levy 1984). Crucially, system operators (SysOp), those who owned and controlled their respective BBSes, were afforded various tools for managing and governing behaviour on their boards, but were not responsible for contributing the entirety of discussion on the site. Sockanathan notes that 'invite only' BBS systems mark the earliest manifestation of what came to be known as the 'darknet': the portion of networked content not available to all internet users, which includes private trackers like Jekyll (Sockanathan 2011, 187). Many BBS systems attracted tinkerers, programmers, and 'hackers' who created 'private', invitation-only boards to share their reverse engineering efforts, which over time evolved into the most historically significant file-sharing scene.

It is this underground, decentralized prestige economy of file-sharers who competed to encode and circulate newly available cultural content (primarily films, television programmes, video games, and music) that come to be called 'The Scene' (Rehn 2003). Known initially as the 'warez scene' (in which the slang term 'warez' is understood to mean any form of copyrighted digital work that has been recoded to the standardized formats of file-sharing publics), participants in The Scene were organized into surprisingly formal networks and groups, and challenged each other to acquire and distribute content via so-called 'Topsite' FTP servers, which were closely-guarded secrets of the network, accessible only by those select members of The Scene.

Sockanathan notes that Topsites made use of a 'credit' system, which required Scene members to upload a certain amount of content in order to continue downloading warez releases, a holdover from the previous warez BBS systems and a clear genealogical precursor to the Jekyll ratio system (Sockanathan 2011, 188-189). The entanglement of

The Scene with OiNk, which offered a putatively risk-free outlet for Scene participants to circulate Scene warez among a larger network of non-specialist music consumers, is a clear genealogical component of OiNk's technical makeup. This is most evident in the private tracker ratio system, which is clearly derived from these early credit systems. Ultimately, this vector of circulation is marked most specifically by the limitations on access: the controls over who was allowed into invite-only BBS warez systems are remarkably similar to those of Jekyll. Here we find a remarkably clear genealogy, beginning with The Scene, whose restrictions on access and exchange subsequently shape OiNk, which in turn shapes Jekyll's even more restrictive platform.

Perhaps more surprising is that Spotify also embodies aspects of this history, rather than the expected simulation of mainstream file-sharing as embodied by Napster. Spotify, Jekyll and OiNk all share an administrative vision of cultural intermediation, where access, content, and permissible forms of use and contribution are all strictly controlled. However, such controls are not an inevitable outcome among licensed music circulation. We might consider, as an alternative genealogy, systems that were also imagined in light of extralegal file-sharing, borrowing from the methodological insights of media archaeology. Two such notable systems, QTrax and Grooveshark, offered two different approaches to the simulation file-sharing cultures within the guise of licensed and 'legal' services.³⁷ QTrax directly imported the peer-to-peer model, creating 'a free music download site where music files were embedded with advertising, and where users

³⁷ Spotify's UI itself has its own genealogy: its search-centric design is highly reminiscent of Grooveshark. As mentioned in Chapter 3, its evocation of the personal digital music library is clearly influenced by the iTunes interface, while iTunes is, in turn, derivative of earlier innovations, especially the cooperative use of Winamp and Napster, where Winamp was used to manage the tracks obtained through Napster, once more connecting the linages of licensed and unlicensed music circulation (Guberman 2011).

had to agree to pass their personal details to the service provider who could then sell this information on to other advertisers (David 2010, 41). With serious issues in its funding and royalty accountings, QTrax has seen multiple iterations, and as of 2016, has transitioned into an advertisement-supported streaming service. Nonetheless, the original emphasis on music downloads — even purporting to simulate the visual design of file-sharing sites — is indicative of the cultural industries’ desire to capture the file-sharing user market through simulation. Grooveshark, one of the first prominent ‘freemium’ streaming services, not only simulated peer-to-peer file-sharing, but it was constructed by it. Users were encouraged to upload any MP3 files they wished to be available through the site, eschewing direct rightsholders negotiations in favor of crowdsourcing (Burkart 2014). The company claimed to be ‘licensed’ and ‘legal’ (despite a lack of actual licensing agreements) through paying out royalties to registered artists based on advertisement revenue generated, and responding to DMCA takedown requests by rightsholders who did not want their music circulated on Grooveshark. However, this innovative approach to quasi-licensed, crowdsourced streaming — one that would largely be adopted by Google with YouTube’s explosive popularity for music³⁸ — was subject to multiple lawsuits, and Grooveshark shut down in 2015.

QTrax and Grooveshark might be described as ‘gray economy’ circulation, as their tenuous claims of being ‘licensed’, and therefore ‘legal’ file-sharing systems, only further strengthen broader points about the confusing and fluctuating definitions of legality and illegality online. Much in the same way, Spotify has both been claimed to

³⁸ Precisely mimicking the legal strategies of most unlicensed file-sharing sites, Grooveshark’s putative legality was through adherence to the ‘safe harbor’ guidelines of the DMCA. YouTube imitates Grooveshark’s safe harbor strategy, but with a higher degree of adherence to the terms of the DMCA (see Silver 2012).

represent the *solution* to piracy, as well as the *continuation* of piracy (Marshall 2015). Furthermore, this lineage of ‘gray economy’ streaming continues despite the dramatic rise in popularity of major label backed licensed streaming services since 2010. The Google Play Store, the dominant mobile device app distributor for the Android platform, contains dozens of streaming choices that attempt to capture the ‘free’ streaming crowd: one innovative example, JOOX, offers a free day of unlimited streaming in exchange for the user ‘sharing’ an ad about JOOX on Twitter. However, it is often unclear to users if these services are properly licensed. The extent to which these services constitute ‘piracy’, as in the case of Grooveshark, is largely defined by the degree of control these platforms offer the cultural industries, and not necessarily by the presence of ‘copyright infringement’.

Soulseek

Another influential and distinctive predecessor of contemporary peer-to-peer file sharing systems was Soulseek, the subject of a monograph in 2009 by Andrew Whelan. This study of the breakcore genre includes a detailed examination of the Soulseek peer-to-peer file-sharing system, an influential predecessor of BitTorrent trackers. Soulseek was developed incrementally between 1999 and 2000 by Nir Arbel, a former developer at Napster, with an emphasis on smaller-scale, localized ‘communities’ (Whelan 2008, 55). While Soulseek was not ‘private’ in the same sense as Jekyll — i.e., it did not function on an invitation system — it embodied a comparable form of obscurity and communality through its opacity. Compared to other file-sharing networks of its time, Soulseek was harder to use and more focused on dyadic exchanges. Rather than a centralized index,

such as Napster, Souseek's search function identified users who possessed files corresponding to the search input, and users 'negotiated' an exchange, based on the seeder's requirements. For instance, a user might specify 'rules' about acceptable leeching behaviour, such as how many albums could be downloaded at a time, or how many albums must be seeded in order to participate in the Souseek circulation of data (what many users called 'normal slsk rules' [ibid., 44]), which Whelan calls 'the file-sharing imperative' (ibid., 42). Whelan's ethnography of the Souseek ecology details how this platform assembled genre-based socialities reminiscent of Jekyll's genre communities addressed in Chapter 6. Likewise, Whelan's study of 'rip crews' (ibid., 60), referring to the individuals who transcode and upload musical releases on the platform, is also directly linked to Jekyll.

Despite having been a relatively small file-sharing service, with a million registered users at its peak, several Jekyll informants mentioned Souseek as the most important platform of their personal file-sharing history. Souseek afforded a restricted and intricately governed exchange modality, while yet offering users access to highly-curated, well-organized digital music files. The manner in which Souseek's search function encourages users to engage in dyadic exchange, as described in the previous paragraph, influences the exchange practices of Jekyll participants. In particular, the ratio system, the request system, and Jekyll's meticulous metadata guidelines are all genealogically linked to Souseek. Furthermore, unknown to many of its former users, the Souseek protocol is still active: it continues to be used by a small number of music archivists, some of which are also Jekyll members. A recent examination of Souseek's continued existence observes its 'tight-knit community that shares recommendations and

in-jokes, or rants about a new band's terrible sophomore release, without intervention from any chatroom overlord' (Menegus 2016). Soulseek powerfully demonstrates how putatively defunct technologies may continue to exist, despite belonging to previous 'generations' of file-sharing history. Furthermore, Jekyll and Soulseek's striking similarities, particularly their shared normative aspects of music exchange, show the genealogical interrelations of technical cultures. Although Soulseek is not the direct predecessor of Jekyll, the broader technical culture of the extralegal sphere shapes their similarities.

I now move from an examination of earlier platforms of digital circulation to a consideration of the genealogies of the commodity forms of musical objects on Spotify and Jekyll, beginning with the streaming subscription model.

Music as a Subscribable Commodity

Well before the capturing of sound on physical media (much less digital media), composers, audiences, and intermediaries explored alternative arrangements for how music should be owned and circulated. In this section, I consider two highly different music 'subscription' models, music lending libraries and mail-order record clubs, exploring how these intermediaries anticipate Spotify's reshaping of music ownership. These predecessors help explain how the music industries' pursuit of further control over music consumption shapes the structure of music ownership on Spotify.

Deirde Loughridge (2015) compellingly connects the lineage of streaming services back to 18th century music lending libraries, noting how many of the debates about artist livelihoods, licensing arrangements, and the affective nature of musical

ownership and investment were prefigured by the discourse around this access-oriented, subscription-based sheet music distribution system. Music lending libraries were modeled after *salons de lecture*, or reading rooms, which were popular in Paris at this time.

However, a key difference is that sheet music lending libraries allowed for patrons to take materials out of the room (Lenneberg 2003, 88). Loughridge finds striking examples of debates about the potential benefits and drawbacks of lending libraries on musicianship:

In 1887, the German piano teacher Aloys Hennes complained that “music lending libraries could very well be called ‘music snacking libraries.’” For Hennes, ownership was a prerequisite for deep musical engagement: “whoever is forced to purchase his notes as property, will firstly give far more thought to what is appropriate for him, and secondly, will thoroughly work through them before he proceeds to a new purchase of notes. Unfortunately, however, ‘music snacking’ has... for some, more charm than the inner penetration and mental grasp of a composition.” [. . .] But lending libraries also served those dedicated to deep musical engagement. Eduard Hanslick [. . .] turned to lending libraries for sustenance rather than snacks: “I was indefatigable to get to know new music...As a subscriber to this loan service I renewed almost daily my musical nourishment and had to take a lot of kidding that I was never seen on the street without the music bag under my arm.”

Loughridge 2015

While lending libraries fell out of popularity before the rise of recorded music, due to reductions in the cost of printing musical works, we clearly see how this relates to the ongoing transformations in the music industries today. Hennes’ statement is indicative of a deep concern over how the nature of property rights affects individual engagement, while Hanslick conceived of repositories offering access to vast archives of musical literature in positive terms. I documented similar dispositions towards streaming throughout fieldwork, as seen in Chapter 8.

The Columbia House Record Club was founded in 1955 as a new division of Columbia Records, established to experiment with the mail-order model for distributing

musical records, which over time expanded to include cassette tapes and CDs. The Columbia House Record Club widely placed advertisements offering multiple ‘free’ records for the price of a single purchase, after which the member would regularly receive similar music, although fees, shipping and handling, and ‘negative option’ billing³⁹ made this offer less immediately lucrative than it may have appeared (Krasilovsky and Shemel 2007, 360). These companies clearly functioned differently from streaming services, yet prefigured several prevalent aspects of access-oriented music consumption: the development of ‘alternative’, direct-to-consumer distribution strategies, a business model dependent on residual income and ongoing subscription fees as opposed to upfront commodity exchanges, the manipulation and circumvention of standardized royalty agreements, and strategic emphases on ‘recommendation’. Recommendations were not merely suggestions, but involved sending consumers what was deemed to be ‘similar’ music, a form of product bundling to increase the total number of distributed music. Record clubs paid significantly less royalties to rightsholders than conventional wholesalers. In fact, these distributors did not pay royalties on ‘free’ records distributed at all, arguing that this business model served as ‘promotional’ distribution (putatively leveling the playing field for independent record labels against the larger major labels, due to the opportunity for increased exposure) (ibid., 361). The debates around the ethics and viability of the record club subscription model, both in terms of the end user’s consumption experience as well as the economic fairness for artists, strikingly resemble the discourse during the rise of streaming services.

³⁹ Negative option billing, an invoicing practice made illegal in 2009 (Trex 2011), was based on periodically charging customers ongoing membership fees unless explicitly opting out, and was characterized by obscurantist terms and conditions clauses and difficult to navigate customer service call centers.

Another fascinating lineage connecting the necessity of ongoing captivation for both record clubs and streaming services can be found in their vanguardist approach to music recommendation: Columbia House's website was the first 'major consumer products company [that] wanted to integrate collaborative filtering into every aspect of a site' (Greening 1998, 53). Collaborative filtering, a technique for automating the prediction of an individual's taste by comparing their past data against the consumption preferences of previous customers, is the algorithmic precursor or foundation to almost all digital recommendation systems, and Spotify's recommendation system lineage draws heavily on these techniques. Equally of interest is the evidence that music recommendation is a component of music subscription services: a subscription-based model must continually dissuade its consumers from cancelling by repeatedly offering agreeable selections. Columbia's focus on genre categories and consumption-based similar suggestions, as opposed to using demographic segmentation to shape recommendations, amounts to Spotify's strongest genealogical precursor, showing that the 'captivation of newness' (which I argue in Chapter 7 is central to Spotify's rentier model) is an imperative for even physical music distribution.

Unlicensed Physical Circulation: Home Taping, Tape Trading, and 'Sneakernets'

The physical, hand-to-hand transmission of music represents an integral component of the pertinent histories of music circulation, but has been unfortunately underrepresented in the literature on file-sharing. Unlicensed music circulation in the 20th century is often traced back to 'home taping', referring to the diverse practices around consumer audio technologies that allowed for the replication and recombination, of

commercial musical works onto blank cassette tapes (Johns 2010). In Chesterman and Lipman's formulation of the predominant forms of music piracy, 'counterfeits' are described as unlicensed replications of licensed media, sold under the guise of legitimacy; 'bootlegs' are unlicensed replications of unreleased works, and 'home tapes' are unlicensed replications of licensed materials informally produced and circulated among audiences (Chesterman and Lipman 1988, 36-45). In this clearly outdated but nevertheless instructive model, Jekyll resembles home taping/trading cultures, as bootlegs are of tangential interest to Jekyll and counterfeiting was almost entirely absent. 'Home taping' technologies, along with the passing of United States copyright law reform in 1972 to cover phonorecords, led to a reimagining of media 'piracy' as an action undertaken by end users and audiences, where the term had previously referred primarily to unlicensed commercial enterprises reproducing musical works without paying royalties (Sinnreich 2013, 33). This legal paradigm shift is an essential component in understanding the shape of unlicensed circulation today, as technologies of circulation were themselves indicted in the debates over intellectual property, musical ownership, and control of musical publics and their consumption.

Home taping controversies prefigured many of digital circulation's debates. Andrew Bottomley (2015) describes how the home taping ecology has pitted the recording industries against both audiences and the consumer technology sector, particularly so-called 'read-write' media. Where older recorded audio formats had been 'read-only', in the sense that the audible content was fixed 'into' the media, cassette tapes can be manipulated, erased, or recombined into newer musical works. The immutability of read-only media is not absolute, of course, as remedial creative practices such as

turntablism and plunderphonics illustrate. Nonetheless, the distinction between ‘read-write’ and ‘read-only’ media is helpful in foreshadowing the explosive growth of remix culture afforded by digital music technologies, as well as amounting to one of the key differences between Jekyll and Spotify. Spotify’s streaming technologies are almost entirely ‘read-only’, while Jekyll’s BitTorrent downloads are easily modifiable once obtained. The regulatory necessity of preventing unmonitored consumption entails the exclusion of audience remixes and manipulations. These contrasting cultural imaginaries of musical media—immutable and mutable—are therefore entangled in the debates over audience ‘piracy’ and the creative rights of audiences.

The tape trading scene emerged in part from the rise of ‘read-write’ culture and the affordances of home taping technologies. Lee Marshall distinguishes bootlegging and tape trading from piracy, file-sharing and counterfeiting by considering the licensing restrictions on the circulated musics. Bootlegs consist of music that has never been released on a ‘legitimate’ label, mostly recordings of live concerts and studio outtake materials (Marshall 2003, 58). Bootlegging emerged in the late 1960s out of the countercultural movement, with participants vocalizing an explicitly anti-establishment ethos, with particular distaste for the commercial recording industries (ibid, 65). The Grateful Dead are credited as the first performing artist to endorse and encourage live show taping, and the antiestablishment culture that came to define the tape trading scene can be traced to the complex social, aesthetic, and musical affiliations of this scene. The aesthetic preferences of these scenes (interests in artistic ‘liveness’ and ‘unmediated’ experiences through acquiring outtake sessions, copies of ‘unedited’ or unmixed master tapes, audience-perspective live recordings showcasing variant improvisational

performances of favorite songs) are well covered in Marshall's overview. This brings to mind the sorts of obsessive, perhaps compulsive, music consumption patterns that define many highly-involved Jekyll participants.⁴⁰ This imagination of tape trading as a network of music circulation outside of the purview of licensed commercial activity is of particular genealogical relevance to the most dedicated and committed participants of the private tracker scene:

Many collectors therefore state that they do not want the industry to adapt and address their needs because it would undermine the authenticity of their own collection [. . .] because music is understood as more authentic if it has not been commodified.

Marshall 2003, 66

While most of the music on Jekyll has been commercially released (and therefore commodified), participant observation within Jekyll discussions of the recording industry revealed the presence of similar beliefs: rather than wishing that the recording industry would assimilate their values towards a more precisely targeted product offering, some of Jekyll's most ardent supporters argue that alternative spaces for circulation are an inherent good. Indeed, 'tape trading' of live audience recordings of bands such as Phish are among the most widely circulated torrents on Jekyll. Moreover, while the private tracker and tape trading scenes differ on what constitutes musical authenticity, the common elevation of authenticity as a core value is linked to alternative modes of circulation. While tape traders largely embraced noncommercial 'liveness' as the primary carrier of musical authenticity, Jekyll's singular defining characteristic is its focus on

⁴⁰ On obsessive modes of music consumption by Jekyll participants, see Case Study #2 of this chapter, as well as the section on temperance in Chapter 9.

fidelity and verisimilitude (Sterne 2012) as the core criteria of ‘authentic’ digital audio, as discussed in Chapter 9.

The final vector of physical, extralegal circulation I want to bring into dialogue here is offline, non-networked digital exchange, typically referred to as ‘sneakernets’ (Filby 2013, 131). The physical transfer of media, either in terms of hand-to-hand exchanges between individuals, or simply the physical movement of data in space (the term ‘sneakernet’ lightheartedly comes about in reference to individuals personally walking the media over to the intended recipient, rather than making use of networking technology), is of significant importance to the history of file-sharing. I want to emphasize that the in-person exchange of digital music has been occurring alongside, in conjunction with, and sometimes in opposition to, online platforms of digital circulation, both in terms of licensed and unlicensed distribution. Much of the file-sharing and unlicensed circulation literature downplays or outright ignores the vital role of interpersonal, physical digital music exchange (notable exceptions include Brown and Sellen 2006, Magaudda 2011, Nowak 2015)⁴¹. Following Magaudda’s study of hard drive sharing, a consistent theme that appeared across my informants was their integration of music circulation into non-computer-mediated lifeworlds, primarily in reference to the fact that their ‘offline’ friends would ask for copies of their music.

One of my key informants, MF, described a detailed personal lineage of interpersonal, non-internet-facilitated music exchange, what he called ‘library sharing’, in which he and his siblings pooled money to purchase a 2 terabyte hard drive (at the time, a

⁴¹ Important work has recently been published on physical networks of digital music circulation in regions of the Global South where internet access is not widespread. See Boudreault-Fournier 2016, Deo 2015, Kirkley 2014, Mina 2015.

several hundred dollar purchase). MF explained in detail personal practices of bringing this storage device to friends' homes, copying the entire iTunes library off of their computers, and then offering friends access to anything on the hard drive. These distributed libraries were assembled in tandem with licensed consumption (e.g., CDs ripped to computers, iTunes purchases) and Internet-based unlicensed circulation, but were materially enhanced by the personal movement of portable hard drives amongst offline social networks of friends and acquaintances. Similarly, the now-deprecated iTunes Music Sharing feature, which allowed users on the same network or 'subnet' to 'listen in' on other's music libraries (most commonly used on university LANs), offers fascinating insight into the online-offline dichotomy of circulation (Volda et. al 2006). Unlike most P2P platforms, which prioritized content searches, often anonymizing or deemphasizing the seeding user making the files available, iTunes Music Sharing followed Soulseek in highlighting the individual owner of musical content: users first browsed to a participant's library (often titled '[Name]'s Library'), and then received a listing of all available songs. While retrieved via networking technologies, Volda et. al argue that the social practices assembled around this mode of circulation entailed the experience of heightened intimacy, more akin to receiving a mixtape from a friend.

In the following section, I offer three representative illustrations of personal practices of music circulation and consumption, demonstrating how their subjective histories are mediated by the histories of music circulation platforms I have outlined above. In each case, the participants' personal history conditions their subjectivity. Moreover, this process is mutually mediating, as participation in both Spotify and Jekyll entails active contribution to the platforms. As new members bring their ideologies of

music consumption and circulation to Spotify and Jekyll, this engenders ‘the mutual transformation of musical object and subject’ (Born 2010b, 88).

Personal Histories of Music Circulation and Consumption: Three Case Studies

To an extent, almost any widespread mode of formal and information circulation, distribution and consumption could be said to inform Jekyll and Spotify’s manifestations of musicking. For instance, purchasing CDs from a music retailer was almost unanimously a component of my informants’ personal listening histories. However, I have chosen to deemphasize the historical lineage of the most well-known modes of digital circulation in this account, particularly Napster and iTunes, due to the overwhelming quantity of preexisting literature on the subject.⁴² These three case studies of personal musical histories demonstrate the entanglements of my informants’ lived histories with the previously examined histories of music circulation. The first two individual histories of music consumption are characteristic of Jekyll members, with the first representing the average Jekyll member, and the second being emblematic of the compulsive downloading practices of extralegal archivists. These individuals’ music consumption practices are mediated by Jekyll’s history: the Jekyll usage of SP, the first case study, reflects the influence of earlier P2P systems, particularly OiNk; in contrast, the collecting practices of SI, the second case study, reflect the influence of music archivist circulation on Soulseek. The third case study offers insight into the personal

⁴² Regarding Napster, see Giesler and Pohlmann 2003, as well as the previous literature review on file-sharing; for iTunes, see Burkart 2010.

listening history of a dedicated Spotify user, PD, and how the introduction of recombinatory modes of listening into mainstream music circulation shaped his music consumption practices.

Case Study #1 - SP: The Mainstream File-Sharing Lineage of Jekyll Usage

'Oh yeah, I can't live without my torrents. I pretty much need a constant stream of music, and [with Jekyll], that stream has grown substantially'

SP Interview, 2014

One of the key informants from my Jekyll fieldwork, SP was in multiple respects a typical Jekyll user, and his personal music circulation history is representative of the majority of lineages described by other participants of the tracker. SP (born 1994) was a college sophomore and electronic musician studying music and business at a university in the Southeastern United States. His childhood involved only conventional radio music consumption until his early teenage years, when he began using the mainstream extralegal P2P program Limewire to download popular rock singles. Although owning a few CDs, SP described rarely purchasing music until several years later in high school, although it remained mostly through iTunes, when a track proved difficult to find, and mostly intermittent. After the demise of Limewire, SP mostly made use of MP3 blogs, 'cyberlockers' such as Megaupload⁴³, hard drive sharing with friends, and streaming Internet radio services Pandora and iTunes Radio. SP reported that each of these platforms offered unique paths into musical discoveries, and in particular, emphasized the

⁴³ Cyberlocker sites are an offshoot of 'freemium' file hosting websites that are most commonly used to facilitate media file-sharing (Lobato and Tang 2013).

importance of friends' musical collections for discovering musical movements that predated his musical knowledge, and to Internet Radio for discovering emerging artists and broadening his appreciation for contemporary subgenres, particularly within electronica. SP first encountered private trackers through a university acquaintance during his freshman year of college, someone who used two (non-Jekyll affiliated) trackers, one dedicated to circulating films, the other for audio production software, although the acquaintance did not have the privileges necessary to invite SP to be a member. After attempting to interview for Jekyll but finding the wait times not worthwhile, SP received a Jekyll invite from another acquaintance and quickly engrossed himself in the musical offerings of the tracker, eventually joining several other trackers to cover other categories of digital media circulation. However, Jekyll remained by far the most important component of his digital media ecology, as it both afforded new methods of circulatory participation while also vastly expanding his access to high-quality materials for his heavily sample-based creative practice. SP began releasing amateur electronica music shortly after joining Jekyll and continued also to make use of streaming services, particularly Spotify, most often for music streamed from his mobile phone while away from his computer, and also to discover new music.

This personal history of music consumption conforms broadly to what I consider to be the most typical and representative ideal type of 'average' Jekyll users. First, note that Jekyll is described, in terms of personal musical histories, as a 'gateway' of sorts, one that leads out of mainstream networks of circulation and into an unprecedented archive of well-indexed, meticulously curated and organized digital music. My informants described a moment of awe when first grasping the scope of the Jekyll index.

The experience of Jekyll membership was also routinely described in terms of its exclusivity, something that the users' non-Jekyll peers were not privy to, which I argue is closely related to the 'gateway' imagery described by informants. For Jekyll is indeed 'gated' by its interview and invite system, and particular forms of contribution and 'good' participation, governed by the user class system detailed in Chapter 3, permit users to garner further rewards and 'enter' more deeply into the private tracker scene. Secondly, this move into a system of circulation marked by exclusivity and hierarchical ideologies of musical fidelity does not, in fact, preclude the utilization of mainstream circulatory systems. In fact, SP only began to use Spotify *after* joining Jekyll, and I observed a broader acceptance of the affordances of streaming services over the multi-year course of participant observation. SP's continued usage of a spectrum of circulatory platforms, each with distinct social and musical affordances, affective connections, and technologically-prescribed relations is surprisingly commonplace with Jekyll users and deeply informs my theorization of circulatory polymedia, developed in the next chapter. Lastly, note that public BitTorrent trackers, namely The Pirate Bay, were not an important vector in SP's musical history. Although he was familiar with the BitTorrent protocol and had made occasional use of it before to obtain software, he did not find it particularly useful for discovering or acquiring music. Informants varied here widely in terms of their historical usage of BitTorrent trackers for music circulation, but The Pirate Bay appeared to play a less central role in individuals' personal histories of music consumption than anticipated, and the Fasttrack and Gnuetlla protocols (i.e., KaZaa and Limewire) were more important for personal listening histories. It is important to note that not all of Jekyll users were immersed in other BitTorrent-based networks prior to

joining Jekyll: many participants such as SP moved fluidly between multiple extralegal music circulation platforms before becoming a Jekyll member.

Case Study #2 – SI: Archivists and Integrated Physical-Digital Media Collections

My goal with my humble library is to maintain a detailed database entry of each recording, digitize every physical item for preservation, and retain the original discs [...]

SI Interview #2, 2014

My second case study pertains to one of the more unique personal histories of music consumption I was able to obtain, that of the informant I call SI. While his personal circulatory practices, history, and ideologies of consumption are perhaps more exaggerated and intensified than my other case studies, he most clearly articulates several themes that I encountered elsewhere, namely regarding the archivist impulse within networks of digital circulation, as well as the simultaneous collection of musical releases across multiple physical and digital media formats.

SI (born 1982) was a graphic designer and amateur music historian, residing in the Northeastern US. He recounted that his musical tastes through childhood were wholly encompassed by what he termed ‘passive-pop-radio consumption’ until first encountering the record *Dubnobasswithmyheadman* by British electronic group Underworld at the age of 16. SI described an immediate fascination with the group, spending the next five years collecting the entirety of Underworld and frontmen Karl Hyde and Rick Smith’s oeuvre, which numbered over 300 albums and singles. Following Underworld’s aesthetic precursors led to a deep interest in various branches of experimental musics, namely free jazz, musique concrète, and ambient music, which he explored through multiple platforms, notably Napster and public BitTorrent trackers. At the time of our first

interview in January 2014, his collection numbered roughly 1,500 LPs, 1,000 CDs, and 10,000 digital albums. Through this process of acquisition, SI developed an interest in collection management, trying out several different approaches to cataloguing releases for both digital releases and physical records. SI was deeply passionate about cataloguing and metadata organization, eventually settling on the software application OrangeCD for managing and keeping track of his physical and digital libraries. SI's passion for collection management was intertwined with his archivist sensibilities, wherein organizing his music collection was also a deeply satisfying musical experience. His interest in keeping track of release date, reissue dates, and catalogue numbers extended to purchasing a USB barcode scanner in order to expedite the input of release information into the database.

SI was strikingly platform-agnostic throughout our series of discussions, often referring to acquisition methods in terms of overarching motivations rather than the technical specifics of his holdings. In terms of acquiring physical records, he said he largely purchased albums in bulk from thrift stores and estate sales, reselling multiply-held releases on the online vinyl marketplace discogs in order to fund further acquisitions. SI had acquired most of his digital collection from public BitTorrent trackers prior to joining Jekyll, primarily downloading entire artist discographies (subsequently retagged and organized according to his personal library management preferences), which he described as commonplace on public trackers. After finding public trackers to be diminishing in terms of available content, SI joined Jekyll in 2013, but was relatively disappointed in the tracker's guidelines for required metadata, finding them not equal to his own higher standards. Additionally, he was disappointed to find that

Jekyll required contributors to upload individual releases, rather than entire discographies, which he claimed would be too time intensive. Looking toward the future, SI mentioned the possibility of establishing a self-hosted repository of his digital archive outside of Jekyll, so that others could upload his holdings to the tracker.

One of the most immediate insights pertains to SI's relative lack of interest in circulation and reciprocity. Considering his exhaustively intricate practices of acquisition (he mentioned that his personal flowchart for determining if a release was worth acquiring, and if so, which formats were necessary, was multiple pages long), he was not interested in contributing back to Jekyll in an altruistic manner. I trace this uninterested attitude towards circulatory participation back to a personal orientation towards *completeness* in consumption. SI's single-minded approach to acquiring the entirety of an artist or movement's works was goal-oriented, aimed at achieving the most possibly complete collection. Even the resale of unneeded records on Discogs was pursued in order to acquire funds to purchase more albums. SI's long-term involvement with music file-sharing is oriented to bequeathing a legacy of a 'totalistic' archive of the music he collects, without regard to potential socialities produced. That is not to say that SI behaved in an anti-social or otherwise illegitimate manner. Rather, SI's acquisition practices were processual and ongoing, always oriented towards the expansion of accumulation, rather than a focus on redistributing his collection.

The evolving interconnection of SI's physical and digital collection is a further point of interest in SI's archivist ideology. If the work was widely available on all formats, the lossless digital audio format FLAC would suffice for SI, unless the physical release offered additional benefits (for instance, a booklet, or desirable liner notes).

However, if offered the chance to obtain a rare work on CD, one that was not widely available elsewhere, the CD was considered a ‘worthwhile’ purchase even if it was not as personally desirable as other releases only owned digitally. In this sense, SI’s collecting practices were notably archival, primarily concerned with the relative rarity of potential acquisitions as well as the expansion of held works. What is important about this finding is that SI understood his collection as integrated, as seen in his OrangeCD database cataloguing vinyl records, CDs, and digital albums simultaneously. Such integration was not the case with my Spotify informants, who tended to describe their musical possessions separately, in terms of what was ‘owned’ versus what was ‘saved’ or ‘in my Spotify’. Jekyll users, on the other hand, were more likely to speak about their music collection in terms of integration, describing vinyl acquisition practices in similar terms to their Jekyll-afforded circulation. I contend that this distinction must relate to differing ideologies of music ownership. SI’s archivist disposition focuses on the content of his personal music collection, across all formats, with an aspiration to completeness that is characteristic of older modes of music archiving. This brings the complete oeuvre of certain artists to the fore, which contrasts with the more pragmatic, listening-focused consumption practices of Jekyll members such as SP.

Case Study #3 – PD: Spotify Participation as an Intensification and Appropriation of Mainstream Consumption Practices

I started using Spotify before [its] public launch here in the UK: I remember one of our family friends talking about it one night at dinner and he sent an invite over my way. Right from then I was hooked, it was like a moment in my life I look back and saw the start of a revolution in front of my eyes.

PD Interview, 2014

This final case study is suggestive of how Spotify usage draws on the lineages of both licensed and unlicensed circulation. PD (born 1992) was an engineering student from the United Kingdom and a devoted Spotify user, having joined the service during its invitation-only initial launch in late 2008. He richly described a childhood filled with music consumption, with his earliest childhood musical possessions on cassette. In his pre-teenage years, he was given a portable CD player, which he recalled using daily, and regularly shopping at the British music retail giant HMV for new albums. Once he acquired a personal computer, he frequently produced mix CDs from his albums and admitted to occasionally using file-sharing services, primarily to acquire single songs from albums which he had no other interest in purchasing. PD attributed his willingness at the time to make use of unlicensed circulation to a lack of suitable licensed options, stating, ‘I feel that we were limited by the technology we had, which made music sharing more needed’. PD’s recombinatory listening practices were intensified further after receiving a first generation iPod Shuffle in early 2005 (brought back by his father on a business trip in the United States, as these MP3 players were not yet distributed in the UK). After joining Spotify initially on its advertisement-supported Free service, he quickly shifted his listening habits to accommodate it as his primary source of music consumption, first upgrading to the now-deprecated ‘Unlimited’ subscription (which removed the limitations on the amount of permitted streaming), and then upgrading to Premium after purchasing a supported smartphone. He described how his transition to an access-based mode of consumption—one that included a previously unprecedented catalogue of music—was revelatory for his musical practices, inducing a rapid expansion of his musical tastes due to Spotify affording the discovery of new artists and genres. At

the time of our interview, PD described his primary mode of music listening as 'in the background', in that he constantly used the Spotify Connect feature to broadcast music to networked speakers in his current location (e.g., living room stereo, wireless headphones, and a car stereo), making use of extensive personal playlists curated to specific situations.

The presence of both licensed and unlicensed consumption in the formation of PD's personal music history is shared by almost all my informants, but his preference for licensed modes of circulation perhaps explains in part his dedication to the streaming model. The reproduced quote at the beginning of this section strikingly mirrors how many Jekyll members first described file-sharing. Both describe their initial experience with the vastness of these platforms of circulation in terms of awe, suggesting how limited their previous modes of music consumption had been. This is, of course, not merely coincidental. Spotify is designed to simulate file-sharing platforms, in which a simple, search-based computer application would locate and quickly acquire almost any song imaginable, as addressed in Chapter 8. Additionally, PD's historical affinity for the 'mix CD' format, with both mix CDs and shuffle-based MP3 devices being of particular importance in his personal music history, is also instructive for understanding Spotify's playlist-oriented formatting of circulation. While several informants, including SI, railed against the streaming model as not conducive to forming a musical collection and completely incompatible with the important musical meanings associated with ownership, PD's personal musical collection prior to joining Spotify was primarily oriented around the mixing and reordering of songs from his own albums. In this way, the transition to a new mode of music circulation was less dramatic for PD than for listeners who considered the 'album' to be the irreducible work, as PD's practices of ripping and

burning CDs were simply reframed, and in fact intensified, in Spotify's playlist model of music organization.

Conclusion

Attending to the historical contingencies of technologies draws out the multitude of influences that shape their design and helps explain how they enter into media consumption practices. In this chapter, I have examined historical precedents of extralegal and access-based music circulation, showing how Jekyll and Spotify are linked to earlier modes of music circulation. Through a consideration of the history of these predecessors, salient traits of each can be found in Spotify and Jekyll. OiNk, as Jekyll's immediate predecessor, carries the strongest genealogical link, influencing Jekyll's prestige economy and focus on meticulous metadata curation, among many other strong commonalities, but other systems' influences are discernible as well. The origins of access-restricted private trackers are linked to BBS communities, and the ratio system's shaping of reciprocity is closely connected to Soulseek and its file-sharing lineage. Napster and other mainstream file-sharing services also influence Jekyll, as the pitfalls of these systems have led to its exclusivity and regulation of contribution. Spotify's rentier subscription model bears resemblance to music lending libraries, along with more recent attempts at making music a subscribable and on-demand commodity. Most importantly, Spotify is historically linked to the extralegal sphere, as evidenced by its early, BitTorrent-derived architecture and simulation of file-sharing social features.

While Jekyll and Spotify diverge from each other in design and legality, their shaping of musical practices reflects their historical interrelations. The three personal

case studies offered embody these histories as they inform and influence individual histories of music consumption and circulation. The stories of these three users show how individuals bring their own histories to Spotify and Jekyll, which ends up mutually mediating the other. In each case, users' consumption and circulation practices are shaped by the platform, but their participation in turn influences the contents and contours of the platform. In the subsequent chapters, I analyse Spotify and Jekyll in light of these findings, beginning with the theorization of polymedia in Chapter 5.

Chapter Five: Social Experience and Spaces of Participation: Theorizing Polymedia

In this chapter, I outline the shape of Jekyll's multiple social spaces, and bring Jekyll's complex social ecology into dialogue with the literature on polymedia. I also expand on the theory of polymedia to cover new media platforms where textual or visual communication is not the primary object or focus of circulation. This term was first formulated by Mirca Madianou and Daniel Miller through a series of ethnographic publications (see Madianou and Miller 2011, 2012a, 2012b) on the digital communication practices of migrants, with a particular focus on familial relationships. In their most systemic attempt at devising a theory of polymedia, they define it as 'an emerging environment of communicative opportunities that functions as an "integrated structure" within *which each individual medium is defined in relational terms in the context of all other media*' (Madianou and Miller 2012b, 170; emphasis added). In a polymedia ecology, individual communicative platforms are said to lose distinctive features (in a manner unlike earlier technologies, where lines of differentiation were clearly drawn, such as fax versus email), towards 'an understanding of new media as an environment of affordances' (ibid.). Madianou and Miller's articulation of polymedia is significantly derived from and responds to the work on 'convergence culture' by Henry Jenkins (2006) as well as Illana Gershon's notion of 'media ideologies' (2010).

The relational usage of multiple social platforms within the Jekyll ecology is best understood as the tracker's adaptation to the multitude of circulatory personal practices its users enact, inclusively drawing together multiple outlets for different forms of social and musical expression. Jekyll's mixture of asynchronous and synchronous

communication spaces comes from the social, technical and musical affordances of each platform. The importance of ‘external’ social spaces for Jekyll sociality, which are hosted outside the governance of Jekyll administration, is a crucial finding for recognizing the types of affordances technologies can offer to musical publics. In the following section, I offer ethnographic materials on several Jekyll social practices that exemplify this relational approach to media choice and usage. Thereafter, I conclude the chapter by returning to and refining the polymedia literature in light of the relational media practices of Jekyll users.

The Internal Social Ecology

In Chapter 3, I detailed the major components of Jekyll’s ‘internal’ social ecology, particularly the user class system, the forums, and IRC. I noted the distinction between the asynchronous forums and the synchronous IRC chat, particularly how the difference in governance affects the tone and content of the discourse contained within both spaces. I find that IRC, with its dozens of channels, synchronous format, and its lack of specialized staff moderating the discourse, is a much more volatile and conflictual social space. The Jekyll forums, conversely, are closely moderated by dedicated staff members, and therefore contain less inflammatory and crude discourse. I consider further these two types of musical discourse, and how the medium shapes these socialities.

IRC contains some of Jekyll’s most intriguing polymediated behaviours, particularly indicative of how music is instrumentalised in identity formation on Jekyll. The online music database and listening history utility last.fm, a self-monitoring system that allows any user to see her or his own listening history, is highly popular with Jekyll

users for tracking and analyzing personal listening patterns. After linking their last.fm account to a user-configurable IRC bot, users are granted access to a number of commands to display personal last.fm information. The most common of these is the ‘.np’ command, which, when entered into the chat, prompts the IRC bot to post the artist and song title of the user’s currently playing track. While idling in the general chat channels, ‘.np’ is among the most common posts, especially when conversation lulls, as this conspicuous display of personal aesthetic preferences frequently generates new avenues of discussion. One form of pleasurable exchange on IRC is therefore the revelation of one’s own musical identity to others through this automated monitoring of listening, a type of self-objectification afforded by the polymedia integration of last.fm and IRC.

The ‘.compare’ command is a further iteration of the .np bot, but oriented to engendering a unique mode of dyadic exchange of musical affinities between participants. A user interested in ascertaining the similarities in taste with a fellow member can enter the compare command, along with the other’s username, and the last.fm API⁴⁴ returns a numerical calculation of shared taste along with a list of artists both users registered in their listening history. The following example from my fieldnotes denotes the format: ‘[User1] and [User2] are 60% compatible! Artists they have in common: A\$AP Ferg, Oneohtrix Point Never, Lil Ugly Mane, Danny Brown, Run the Jewels’. This indicates the continuous undercurrent that social relations should be based on shared musical tastes, a kind of constant search for musical affinities as the basis for

⁴⁴ Short for Application Programming Interface, the Spotify API offered independent developers the ability to access particular aspects of Spotify’s internal database, primarily drawing on the streamable library content or metadata stored about these tracks.

new social relations. This notion of musical ‘compatibility’, imported from the last.fm conceptualization of the social potentials of shared musical interests (see Baym and Ledbetter 2011), was a significant vector in the formation of interpersonal connections, as well as the ‘sizing up’ of new members. On multiple occasions, after I entered into an ongoing discussion about a new music release, or when private messaging an individual user to discuss music, a user would run the `.compare` command, primarily as a way to judge the degree of affinity via shared musical tastes. IRC participants frequently take the musical opinions and recommendations of ‘similar users’ more seriously than those who register low similitude.

The last.fm commands such as these served to ‘musicalise’ discussion, often interlinking aesthetic discourse to otherwise unrelated discussions—e.g., world events, romantic relationship issues, or current technology. For instance, in a January 2014 discussion, the upcoming NFL Super Bowl was the primary topic of conversation. When the halftime performer pop singer Bruno Mars was mentioned, participant YI was derisive, mocking Mars and negatively comparing his artistic integrity to another Super Bowl performer, the funk-rock band The Red Hot Chili Peppers. YI contended that Bruno Mars had uncreatively appropriated the sound and image of Michael Jackson. When another participant responded with a defense of Bruno Mars’ ‘talent’ and performing prowess, YI used the `.np` command to show that he was currently listening to Michael Jackson. YI’s `.np` command was used to express his disapproval of the Super Bowl halftime performers and aligned his own aesthetic affinities with musical works he considered more ‘original’. Furthermore, this aesthetic judgment was interwoven with YI’s larger point about the ‘boring’ nature of the Super Bowl event itself. While this

musicalisation of general discussion occurred elsewhere within the ecology, the prevalence of these two commands led to particularly vibrant modes of musical within IRC, along with searching for musical affinities and for social relationships based on them.

The asynchronous and governed nature of the Jekyll forums is not ideal for containing these freewheeling modes of musical discourse. However, the Jekyll forums are perhaps an even more important space for the expression of musical tastes and knowledge. The ‘genre communities’ I examine in Chapter 6 primarily discuss and curate their collaborative musical projects through the Jekyll forums, with IRC holding their more casual and ephemeral conversations. The forums are the primary space for long-form and thoughtful discussions about music within the Jekyll ecology. This is in part due to the temporalities of synchronous IRC chat: in the time it takes to type out a considered response to a question, the fast-paced conversation of IRC is likely to have switched topics. In contrast, the asynchronous, ‘threaded’ format of the forums, where each topic of conversation is given its own online space within a subforum, allows for conversations to unfold over the course of days, weeks or even years in some cases, with users referencing older threads to inform current discussions.

The asynchronicity of the forums is crucial for understanding the tone and content of forum discourse. IRC conversation is ephemeral, with no archives of discussions unless a member chooses to store logs of the chat on their computer, thus allowing users to express controversial opinions with a lower probability of these words being used against them at a later date. All posts to the Jekyll forums since its inception are viewable, and each user’s post history is accessible through the search function and the

user's profile page. This means that users can be 'held accountable' for the contents of their posts, both in terms of social standing and potential sanctions. If a user in a thread posts contradictory positions in separate posts, another user may 'quote snipe' them, an emic term for posting multiple quotes side by side in order to draw attention to the contradictions or objectionable opinions espoused. Likewise, moderators can punish users who disobey the rules days or weeks after the offending post due to its ongoing presence within the forums.

External Affiliations within the Jekyll Ecology

The Private Facebook Group

The following sections address those social spaces of Jekyll that are not hosted on Jekyll's server, drawing instead on the resources and affordances of multiple social media platforms. The first of these is the private Jekyll Facebook group. Consisting solely of an asynchronous 'feed' of textual posts, links, images, and audio files, the group has born witness to everyday conversation as well as a counterpublic sphere. A key finding about Jekyll members' use of Facebook is that they employ this commercial online space in order to get around or escape the intensive forms of moderation and policing that characterise Jekyll. The importance of this finding warrants a thorough consideration of Facebook usage affiliated with Jekyll.

Private Facebook groups allow members to interact in an access-restricted parallel environment of online identity, where their typical Jekyll 'presence' — their username, user class, and other markers of prestige — are missing, instead associating their 'real

name'⁴⁵ with their online expressions. Admission to the Facebook group is quasi-regulated, though technically 'unofficial' (understood here to mean 'not controlled by a Jekyll staff member').⁴⁶ Jekyll members desiring access to the private group send a Facebook message to the group administrator while simultaneously posting their initials to the 'Facebook group' thread in the forums. The truism that Facebook is used for 'real-life' friendships, as opposed to social relations formed solely through online interactions, is clearly contradicted here. Similarly, while Jekyll sociality is marked by an overarching interest in technological privacy and anonymity, group members are willing to associate their Facebook account with a collective dedicated to discussing file-sharing.

The group is not primarily used for the types of social and musical discussions found on other platforms, such as new releases, upcoming concerts, or more general conversations about current events. The Facebook group's primary functions have evolved to include request filling negotiation, image macro sharing, and debates regarding audio technology and file-sharing culture. Request filling negotiation, referring to the Requests system explained in Chapter 3, is the most common type of post on the Facebook group. The most common style of request negotiation is what I call a 'request highlight', consisting simply of a hyperlink to the user's request in the Jekyll index, as well as conveniently providing a link to buy it from Bandcamp or another online retailer. So-called 'request begging' also involves the user asking others to contribute to the

⁴⁵ As members of Jekyll are primarily known by others by their username, Facebook's 'real-name system', counterintuitively, functions in a manner to a pseudonymous system for Jekyll users: their Jekyll identity remains hidden from all except the group administrator, so antisocial expressions are unlikely to result in account termination.

⁴⁶ Surprisingly, the Facebook group administrator is not Jekyll staff: after changing hands several times, the administrator is an Elite user and highly dedicated to the 'communal' aspects of the tracker, but is otherwise an ordinary member.

bounty, making the request desirable and more likely to be filled. Within the comments on the Facebook post, other Jekyll members will ‘negotiate’ the request by stating the ‘bounty’ value at which they would be willing to fill the request. These types of request negotiations are discouraged on the forums and IRC, leading to their popularity on the Facebook group.

The image macros (e.g., internet ‘memes’ consisting of images with overlaid text) posted to the Facebook group are typically sardonic in tone and mock various aspects of digital music consumption and the lifestyles of self-described music aficionados. The image macros reflect a particular self-deprecating take on Jekyll users’ musical ideologies, depicting themselves as hopelessly elitist consumers of obscure independent music and audio playback equipment, unable to relate to the musical tastes of the general public. These images often mock the pursuit of cultural capital sought simultaneously by those projecting either ‘snobbish’ or ‘omnivorous’ tastes (Peterson and Kern 1996). In Figure 14 below, the depicted individual is standing alone at a party, unable to engage with others due to an obsession with obscure music and music message board culture. The solemn-faced figure is used to self-deprecatingly represent a depressed and/or lonely individual. The image is self-reflexive and self-ironising while also being celebratory and affirmative of the obscure culture of the underground connoisseur. Moreover, this obsessive interest in underground subjectivities is more widely characteristic of Jekyll as well.

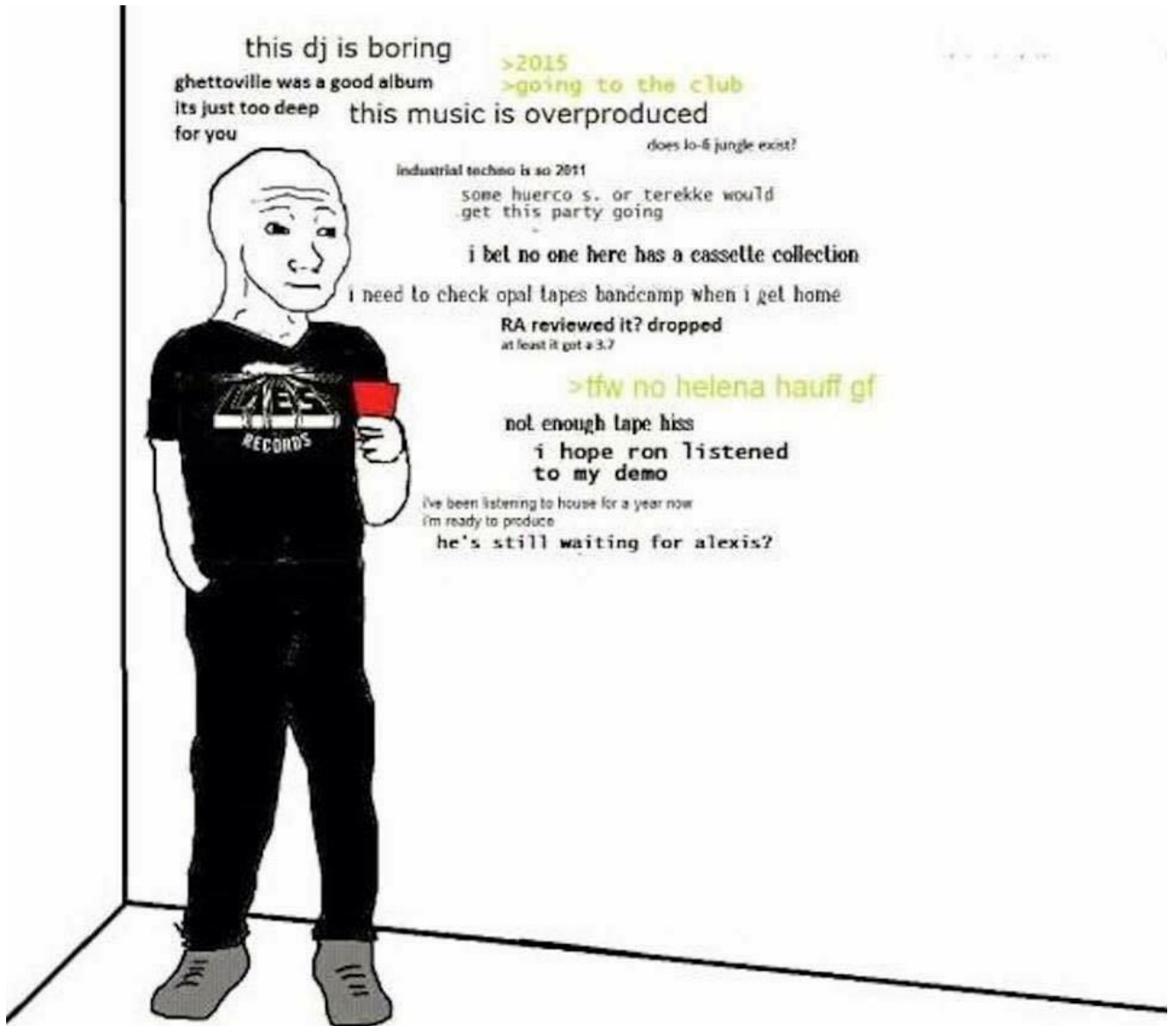


Figure 14: Anonymized submission to Jekyll Facebook group, 2015

Lastly, the discussions regarding music, technology and file-sharing are well-trodden topics throughout the Jekyll ecology, but surprisingly, the general tenor of these debates when brought up in the Facebook group often contains a snarky cynicism and aggressive affectations unmatched elsewhere within Jekyll. The nature of the debates

within the private Facebook group is a key finding for my understanding of Jekyll polymediated culture. The Facebook group is the most likely space within the Jekyll ecosystem to devolve into personal attacks. Here I reproduce several representative comments within a thread (slightly reformatted and modified to preserve anonymity), debating a perceived decline in musical and technical knowledge in the Jekyll community, which quickly devolves into coarse personal attacks.

Jekyll no longer counts as a community founded on technical or digital music encoding knowledge anymore. [Jekyll's primary competitor] is the one of the few communities left. I've been personally attacked here because I said all of you who donate are pathetic. Everyone from my old school who used to mock my music tastes are now Jekyll users. The informed community is gone.

(Anonymized Facebook group member #1, 2014)

Fuck all you people and your negativity, Jekyll and the staff are great.

(Anonymized Facebook group member #2, 2014)

Lol, you're a douche.

(Anonymized Facebook group member #3, 2014)

All these shitty posts are amusing. I don't deny I've contributed, but I still find it funny.

(Anonymized Facebook group member #4, 2014)

What is most surprising about the comparatively contentious social dynamics of the Facebook group is that the association of 'real' identities—i.e., using Facebook accounts, containing given names and personal photographs, which are more closely linked to the broader everyday lifeworlds of individuals—to Jekyll social activity did not make the discourse more civil, as one might expect. 'Trolling' online is often linked to the supposed anonymity, and immunity to personal retribution, afforded by screen names. Judith Donath (1996) has observed that trolling is fundamentally a game of identity deception. However, my findings suggest that Facebook's lack of direct association with a Jekyll username is beneficial for trolls, as their Jekyll pseudonym is their 'real' name within the ecology, not their legal name used in the Facebook group. This is a key point

in understanding Jekyll polymediality: one must situate this abusive discourse relationally, by recognizing how the private Facebook group fits into the broader Jekyll ecology.

The private Facebook group becomes a backchannel for criticism and dissent, in this way approximating something like a counter public sphere for Jekyll.⁴⁷ This group offers affordances that necessarily lead to, or shape, the types of behavior it generates. I contend that several intersecting factors have shaped the discourse, and the technical capabilities of Facebook private groups are only tangentially related to the invective posted above. The first is the complete lack of comment moderation, a unique trait amongst the Jekyll social platforms. Similarly, users who fear being reprimanded on the official platforms use the group as a Jekyll backchannel of sorts, speculating about the financial solvency of Jekyll hosting accounts or speaking openly about discouraged topics. Besides the propensity for unmoderated online spaces giving rise to aggressive behavior, the Facebook group's lack of governance also leads to active users who have been banned or deactivated from the official Jekyll spaces. Consequently, many of these 'inactive' users profess negative feelings regarding the site, and use the group to complain about supposedly unfair treatment by administrators. Subsequently, other users come to imagine Facebook as affording consequence-free speech. These dynamics are not the inevitable result of Facebook's unique technical affordances but only become explicable when its relationship to the rest of the Jekyll ecology is analysed.

⁴⁷ Born's model of music's social mediation (2011b) is helpful in showing how counterpublic imagined communities (second plane) and identity formation (third plane) are mutually constitutive.

Understandings of the function of the Jekyll Facebook group are based on its relationship to the larger ecology, an essential point for my theorization of Jekyll polymedia.

Twitter

Jekyll's presence on Twitter is almost wholly different from the Facebook group, deviating in sociotechnical structure, staff involvement, stated purpose, and member usage. The polymedia utility of Twitter is a top-down announcement dissemination platform, primarily targeting users who do not visit Jekyll daily.

While the private Facebook group is only tangentially affiliated, run by a committed but ordinary user, Jekyll staff manage an official Twitter account, followed by tens of thousands of users, which is used to circulate messages and site updates. These tweets include details about changes to the tracker, special site events, photographs of new merchandise, occasional links to articles related to the file-sharing scene, as well as reminders to log in to the main site for access to other, more 'private' site announcements. One quasi-official account is dedicated specifically to monitoring site, IRC and tracker availability, posting updates when the status changes, particularly useful during server outages. Twitter's most essential offering for Jekyll is a communication channel, conveniently accessible on a smartphone, quite separate from and complementary to Jekyll, which requires a personal computer operating system. However, there is no significant Jekyll communal activity on Twitter. The 'media ideology' (Gershon 2010) of Twitter for Jekyll users is that the 'publicness' of the

platform, which affords the easy dissemination of important announcements, is not sufficiently ‘private’ for engaging in more sensitive Jekyll discourse.⁴⁸

Licensed Streaming Services within Jekyll

Perhaps one of the more surprising findings regarding polymedia musical practices is the frequency with which licensed digital music services are deployed within Jekyll. Of these, the two most prevalent streaming platforms I encountered were Spotify and YouTube, both with a clearly defined purpose within the Jekyll ecology.⁴⁹ I will show that while YouTube represents an inversion of formal Jekyll music circulation, this mainstream platform offers a simple and quickly accessible method for sharing music within Jekyll’s discursive spaces. Similarly, Spotify’s public tools for integrating its streaming catalogue into other websites allows for a Jekyll utility for ‘trying out’ music before downloading. The relational integration of licensed circulation within the Jekyll ecology is strong evidence of the polymedia structure of Jekyll.

YouTube

YouTube links are the standard method of ‘sharing’ music within the Jekyll IRC channels, counter to my expectation that most would link to the release on the Jekyll index. A representative afternoon during fieldwork spent ‘idling’—logged in, but not actively contributing—in the main IRC channel included over 100 YouTube links, and

⁴⁸ This is not to say that Jekyll members exclusively use Twitter for receiving Jekyll announcements. While Twitter’s role within the Jekyll ecology is limited to these functions, Jekyll members may use Twitter as part of their non-Jekyll social media practices.

⁴⁹ The streaming site Soundcloud was also in usage within Jekyll during my fieldwork, but was not systemically integrated with the ecology to the extent that the other two were.

while several of these were videos unrelated to music, the majority of these links led to musical works. These videos contained the audio file, accompanied by either a slideshow of images of the artist, or simply a still photo of the album art.⁵⁰ As was noted frequently by my informants, YouTube is an unorganized platform for the circulation of digital music, as the site lacks a hierarchical catalogue of musical content and artist discographies. The two primary reasons YouTube is used to share songs on IRC are simple: YouTube does not require a user account login to stream content, and it was also the most reliable streaming platform worldwide. Also, it was the least likely platform to suffer from region-specific limitations⁵¹ or have content removed due to takedown requests. Thus, YouTube song sharing is attractive because it offers an inversion of Jekyll: a simple, unmoderated, and highly comprehensive streaming site.

Outside of ‘checking out’ music during IRC discussion, YouTube music circulation is largely nonexistent in the Jekyll ecology. YouTube was frequently described in discussions about file-sharing culture as the antithesis of Jekyll, along three conceptual axes: downloading versus streaming, properly encoded audio versus ‘low quality’ transcodes, meticulous indexing versus non-hierarchical search, and closely

⁵⁰ The overwhelming popularity of album art videos on YouTube is a prime example of musical ‘remediation’ (Bolter and Grusin 1998). The usage of audio files accompanied by still photography directly imitates the UI design of media playback applications such as iTunes, which themselves remediate the material packaging conventions of physical media formats, particularly vinyl records. This evolution in music circulation, in which music files are transcoded into essentially ‘empty’ video files for distribution on a video sharing website, underscores the fact that this is not an artifact of convergence culture or a rational adaptation to YouTube’s unique technical affordance. Rather, YouTube has emerged as the preeminent music streaming platform worldwide due to a complex legal environment that has quashed many of YouTube’s competitors, an account of which exceeds the scope of this thesis and deserves further scholarly inquiry.

⁵¹ The notable exception to YouTube’s accessibility is Germany, due to an ongoing conflict between YouTube and the German performing rights organization GEMA. German IRC participants often humorously disparage their copyright industry when YouTube links are shared, indicating strong disapproval about region-specific licensing restrictions.

regulated participation versus unmoderated participation. YouTube sharing and consumption speaks to an indifference towards ownership of the musical object, and often an indication of the temporality of interest: my informant JS explained that he found YouTube useful for songs he was only interested in hearing for a short period of time, such as a Top 40 pop song, while ‘ownership’ was necessary for an album that demanded repeated engagements. Jekyll users therefore imagine themselves as participating in a ‘high culture’ of music circulation. Jekyll’s exclusions, required literacies, high fidelity audio and intricately-designed index serve to distinguish Jekyll as a rationalized and sophisticated space for circulation, the antithesis of which is thought to be the anarchic, quality-agnostic YouTube. Once more, YouTube’s distinctive and limited role within the Jekyll ecology must be understood in terms of how Jekyll defines itself in relation to mainstream media like YouTube.

Spotify

Spotify’s most prominent role within Jekyll during fieldwork was in connection to several ‘browser extensions’ coded by Jekyll participants. These scripts integrate aspects of Spotify’s public API — an interface allowing programmers to access components of Spotify’s databases — within the Jekyll index. Browser extensions allow for the customization of web pages on the user’s computer, such as changing the appearance of the site, automatically blocking advertisements, or adding new functions to a website. The most popular browser extension within Jekyll, pseudonymised as ‘SpotiJekyll’, automatically activates when a user opens any release webpage within the Jekyll index. The script searches the Spotify catalogue for a matching artist and album ID. If available,

the script creates an embedded 'Play Button' within the empty right-hand column of the browser, offering the user an option to stream the song directly from Spotify without leaving the Jekyll browser window. SpotiJekyll proved so popular that several other participants programmed similar extensions, extending this functionality to other operating systems and web browsers. This functionality is extremely useful for Jekyll users: it allows them the opportunity easily and immediately to sample a song before choosing to download. The ratio system is a significant factor here, as each download carries a 'cost' within the torrent economy (and consequently discourages indiscriminate downloading. This also relates to an inherent restriction of Jekyll, which prescribes full album downloads (as opposed to acquiring a single track from an otherwise unwanted album). The popularity of 'testing' a release on the embedded SpotiJekyll extension speaks, once again, to the fact that Spotify is something distinctive when embedded in Jekyll, and thus to the complementary and relational nature of licensed streaming services within the Jekyll polymedia ecology.

Polymedia and Jekyll

In this section, I return to the literature on polymedia, reading its key contributions alongside the Jekyll ecology, and seeing how music consumption might differ from strictly communicative platforms. Henry Jenkins' definition of 'convergence culture' reads quite similarly to what we might expect a concise definition of a musical polymediatic culture: it is 'the flow of media across multiple platforms, the cooperation between multiple media industries, and the migratory behavior of media audiences who will go almost anywhere in search of the kinds of entertainment experiences they want'

(Jenkins 2006, 2). Jenkins imagines an emergent, immanently participatory culture, one in which ‘prosumer’ (see Ritzer and Jurgenson 2010) audiences dismantle the boundaries of digital capitalism, folding platforms into each other through collaborative and creative efforts. In such an environment, participation becomes unbounded by technical restrictions as content circulates in transmedia, platform-agnostic spaces. Couldry’s critique of Jenkins’ notion of the political potential of new media participation is most strongly expressed in his reminder that ‘convergence culture’ cannot be based solely on the media practices of small subsets of users: ‘for any media object, there is a spectrum of engagement and emotional investment, with each of us differently placed along that spectrum, depending on which object we take’ (Couldry 2011b, 491). Couldry convincingly disputes that high-intensity consumers, many of whom are young and middle-class, represent the vanguard of media consumption.

Despite Jekyll representing a particularly ‘high-intensity’ consumption system, Couldry’s critiques are supported by my ethnographic analysis as well, particularly as relates to the demographics of Jekyll and the extent to which their circulatory practices are emblematic of digital music circulation in the 21st century. The majority of Jekyll members participate in consuming and circulating music without communicating textually with others. Less than 10% of Jekyll’s active membership of 150,000 is materially active in the forums in any given month, and of those, many do not frequent the entirety of the Jekyll ecology, choosing to communicate in only one or two of these spaces.⁵²

⁵² These figures are the result of qualitative observation, and as such are intended only to provide a sense of the scale of user participation. Torrent comment participation is not included in this figure, as they are even more difficult to track.

Ilana Gershon's work on digitally mediated relationships provides a theoretically sound method for analysing polymedia environments. She writes, 'people figure out together how to use different media and often agree on the appropriate social uses of technology by asking advice and sharing stories with each other' (Gershon 2010, 6). This collective determination of the latent emotional context of platforms constitutes a 'media ideology', which she defines as 'a set of beliefs about communicative technologies with which users and designers explain perceived media structure and meaning' (ibid., 3). Madianou and Miller, following Gershon, argue that affordances are secondary to 'appropriateness' for understanding communicatory platform choice. The motivation of platform choice within Jekyll is largely due personal understandings of the capabilities and limitations of technological systems. Put simply, the structure of Jekyll's polymedia ecology is not strictly determined by technical factors, but is influenced by the particular music and media histories of individuals. For IRC musical discourse, YouTube is the expected platform for song sharing, although it is not exclusively capable of quick and simple media sharing. Likewise, many social media platforms offer the ability to create access-restricted groups, but Jekyll's private Facebook group remains the primary backchannel social space, despite its lack of anonymity.

Bryce Renninger's (2015) analysis of 'networked counterpublics' on the microblogging platform tumblr offers further insight into imagined affordances that aligns with my formulation of Jekyll polymedia. Renninger's focus is on the tumblr asexual counterpublic, whose communications are linked together by the use of the #asexual hashtag. While Madianou and Miller's treatment of affordances is primarily concerned with the microsocial and emotional implications of platform choice, drawing

heavily on Gershon's 'media ideologies', Renninger acknowledges that tumblr's identification as an alternative sphere is directly linked to its adoption to discuss issues of sexual identity. He writes, 'while some might not care that a wide variety of Facebook friends see their public post about asexuality, there is reason for many to use a counterpublic address to communicate about asexuality at all' (ibid., 1519). Tumblr's unique sociotechnical infrastructure offers the asexual youth the freedom of a 'safe space' SNS, in a manner distinctly different from other mainstream social media platforms. While Facebook broadcasts posts, comments and shares to the entirety of the user's social network, tumblr's tagging system shares posts only with those who follow the tag. Consequently, tumblr has become synonymous with counterpublic communication. For asexual youth, tumblr is understood to be better at drawing together certain forms of social networks based on shared ideologies, interests, and identities as opposed to interpersonal relationships, which has led to the blossoming of numerous networked counterpublics within the site. Therefore, using tumblr to post about asexuality engenders particular modes of sociality.

We see a similar dynamic within Jekyll, as the platforms that constitute its 'environment of affordances' generate unique forms of sociality. Participants imagine the forums to afford a more elevated and detailed level of musical discourse. Therefore, music discussion threads are more likely to contain long, thoughtful critiques of musical releases, compared to the impulsive reactions participants typically post in IRC discussions about the same release. Likewise, the private Facebook group's 'backchannel' affordances engenders the discussion of topics discouraged or disallowed elsewhere.

Conclusion

This chapter has enriched the ethnographic account of Jekyll sociality by examining the multiple media platforms it is enacted within, as well as the complementary role of licensed streaming services. I have argued that polymediatric integration does not represent the breakdown of the differences between technical platforms, as is suggested in the literature on convergence culture (Jenkins 2006). Rather, it speaks to precisely the opposite, which is that platforms are brought into congruence precisely because distinct and complementary affordances are affiliated with each. Two uses of streaming services within Jekyll are exemplary for showing how multiple criteria are evaluated in participants' media platform decision making. The use of YouTube links within IRC musical discourse and the embedding of a Spotify mini-player in the torrent index to preview tracks are not arbitrary, affordance-agnostic platform choices. YouTube link sharing is understood as 'easy' and 'widely available', while the Spotify API allows for deep levels of 'integration' within other webpages. This offers considerable insight into how polymedia integration functions in everyday life for music consumers. What the theory of polymedia shows when brought to Jekyll is that licensed streaming and extralegal file-sharing are not two antithetically opposed spheres of music circulation. Commercial, royalty-generating music consumption constituted a portion of listening practices of many committed Jekyll users.

The chapter also responds to the polymedia literature by reemphasizing the importance of affordance theory. The asynchronous Jekyll forums, and the affordances its search and history tools offer, engender particular modes of participation and discourse

distinct from the more casual, ephemeral, and synchronous IRC chat. Alternately, Jekyll's private Facebook group shows how affordances shape polymedia ecologies. While its lack of moderation is a genuinely unique aspect within the Jekyll ecology, its emergence as the primary space for counterpublic discourse is striking precisely because of its lack of genuine anonymity. While many other social media platforms offer anonymous comment systems, which one would expect to be important for a counterpublic sphere, the 'real' names associated with Facebook accounts are not thought to be traceable to Jekyll accounts. In this way, we see how affordances shape polymediatic environments, while simultaneously recognizing that each social space within the ecology must be understood relationally. In the next chapter, I turn to the comparative examination of the musically imagined communities of Jekyll.

Chapter Six: The Musicality and Communalities of Jekyll

Social Formations

In this chapter, I address the musical literacies of Jekyll participants, its systems of genre taxonomy, and the musically imagined communities nested within the larger Jekyll social formation, referred to as ‘genre communities’. Genre on Jekyll is shown to involve both top-down and bottom-up processes, eliciting crowdsourced genre classification but requiring participant contributions to conform to a hierarchical taxonomic system. Music itself is shown to be governed on Jekyll, as control is built into the technical structures of music classification. The chapter also demonstrates how smaller musically imagined communities represent Jekyll’s nesting of different levels of sociality. This is informed by Christopher Kelty’s work on ‘recursive publics’, defined as digitally-mediated social formations that are constituted by the very building and maintaining of the social spaces in which relations are formed (Kelty 2008, 28). Jekyll’s amateur music production community — pseudonymised here as ‘HV’ — and genre communities’ collaborative curatorial projects are held up as defining characteristics of Jekyll as a whole. Jekyll’s genre communities show how musical knowledge is involved in online identity formation, both individual and collective. While many of the technological practices around Jekyll appear highly calculating and strikingly unrelated to conventional modes of music appreciation, HV and the genre communities demonstrate the richly musical nature of Jekyll experience for its participants.

The Communal Musicianship of Jekyll

This section focuses on HV, a board on the Jekyll forums focused on the circulation and appreciation of Jekyll musicianship. This section supports my contention that smaller scale social groupings within Jekyll, particularly HV, offer strong social relations, based in part on closer musical affinities and microsocial relations. These intimate social relations recursively inform the social dynamics of the broader member base at large. Despite the mere ‘tacit cooperation’ (Sterne 2012, 2222) that defines some participants’ circulatory practices, the majority of Jekyll members believe that communal social relations exist, best exemplified by HV’s quasi-altruistic, highly participatory community. In this way, HV is synecdotal of Jekyll communality.

Jekyll contains a significant percentage of self-identified musicians, ranging from professional touring artists to amateur producers and hobbyists. Consequently, many users produce and upload their own musical works, despite Jekyll not being originally formulated as a site for musicians to exchange personal compositions. In fact, highly specific rules are in place against ‘unofficial’ releases, such as unauthorized fan compilations, amateur mix CDs, and so forth. HV was created to regulate and legitimize member-affiliated musical releases. Close participant-observation within HV reveals a materially distinct social formation, one in which the dynamics of user class, prestige, and economic governance are notably less prominent. The shared experiences of musicianship serve to restructure the dominant social norms of Jekyll, in ways that more ideally suit the ethics and needs of communal musicianship.

HV has unique guidelines for contributing music, but the moderation is less onerous and restrictive compared to most other Jekyll spaces. Members seeking to submit

their work are instructed to create a new topic in HV forum, with the artist and release name in the title, along with tagging the relevant genres and linking an optional biography. Submitters are instructed to then upload the torrent to Jekyll and provide a direct link to the release page, and are also encouraged to link to any third-party distributors, most commonly Bandcamp or Soundcloud. Moderators approve the submission by marking the torrent ‘Neutral Leech’, an important insight into the ratio system more fully considered in Chapter 8. HV’s ‘Neutral Leech’ setting means that ratio statistics are not monitored on these torrents: no costs or benefits are gained from downloading or uploading HV releases. Other members of HV then post feedback on the release, which is typically constructive in tone and rarely devolves into musical elitism or critical invective often found in discussions of non-HV releases. User class is also mostly irrelevant: new members and infrequent participants see little difference in feedback compared to more established users, as opposed to the hierarchical dynamic of other social spaces within the ecology.

Any hierarchical tendencies that emerge in HV are mostly concerned with ‘production values’ and the relative popularity of the release. HV releases from touring, semi-professional musicians are generally the most widely well received. The genres represented vary, but they broadly match the aesthetic tendencies of the rest of Jekyll: electronica, ambient, hip-hop, and indie rock are among the most prevalent. Most are recorded at home using consumer-grade equipment (often using audio production software downloaded from Jekyll itself), but several HV releases are produced in mid-range professional studios, and feature intricate production and mastering techniques, with close attention to audio fidelity.

Further evidence of the social norms of HV can be found in its most popular discussion thread, dedicated to posting incomplete musical works. Members who want feedback on their ‘work in progress’ are asked to upload a version of the work to a third-party streaming site, and the next user to contribute to the thread is required to include informal yet constructive feedback on the previous track before posting their own work.⁵³

Participants who repeatedly post their own music without reviewing others, or who post feedback deemed inconsequential (such as ‘not really my thing’ or ‘I don’t like it’) are mildly reprimanded by HV regulars, and their work is typically ignored until they also provide helpful feedback regarding others’ work. This expectation of reciprocal feedback is reminiscent of a system of balanced reciprocity as defined by the anthropologist Marshall Sahlins (1972).

Several times a year, a moderator will choose an HV release to ‘feature’, which entails this release being highlighted on Jekyll’s homepage, along with an interview with the artist. These featured releases draw exponentially higher levels of interest, with the torrent typically reaching several thousand snatches, along with hundreds of comments. While this is in part a communal gesture, aimed at highlighting and advancing the career of a single Jekyll artist, it also serves as a governmental process to underscore Jekyll’s

⁵³ Soundcloud is the most common host for files in this thread, while finished works advertised in HV are typically uploaded to both Jekyll and Bandcamp. This is intriguing, as while both Soundcloud and Bandcamp offer streaming and downloading services, Soundcloud is thought to provide an easier, more interactive platform for listening commentary (via its innovative tagging and comment system, which affords the ability to comment on particular ‘moments’ within musical works: for instance, ‘sick breakdown’ or ‘great sample’), while Bandcamp is well-regarded for its high-fidelity, ‘properly’ encoded downloads. This is an exemplary instance of the complementary nature of polymedia analysed in Chapter 5, in that Soundcloud, Bandcamp, and the Jekyll index are used in relation to each other in HV.

communal potential in an attempt to associate Jekyll with the creativity of its participants. Indeed, HV is an integral part of Jekyll's internal efforts to 'brand' itself. Writing on the relationship between corporate branding practices and creative cultures, Sarah Banet-Weiser writes:

Brand culture [. . .] [has] animated a new form of individual entrepreneurship whose profile reveals the current relationship of brand culture, creativity, and advanced capitalism. This relationship involves the means by which contemporary capitalist logic underwrites the discourse of creative economies, and the resulting legitimation of the role of the individual entrepreneur within brand culture.

Banet-Weiser 2012, 97

The presence of active artists within Jekyll and the musical works they circulate is used by Jekyll to establish itself as a community of creative individuals.

Furthermore, HV contributors play a small but notable role in the financial support of the tracker. Jekyll moderators have produced a series of HV compilation albums, derived from individual tracks within HV releases. These compilation albums are then made available for 'Pay Your Own Price' donations through a third-party retailer. These musical contributions become de facto monetary contributions, as HV artists forfeit all royalties for compilation album sales. I address these HV releases further in my examination of the Donor System in Chapter 8.

The Social Formation of Genre: Tags, Genre Communities, and Genre

Introduction Collages

The social formations coalescing around genre within Jekyll offer several theoretical avenues into understanding the social nature of Jekyll participation. It offers clear evidence of the importance of music and musical literacies for engendering

particular forms of social relations and generating imagined communities. First, this section begins with a consideration of how genre is defined—both in terms of the musical characteristics of a genre, and also in regards to how individual musical works are categorized—within Jekyll. Jekyll staff purposefully evades applying specific definitions of genre in favour of an always-ongoing deferral to consensus, relying on the literacies of participants to collectively define the musical affiliations of the index. However, this taxonomic labour occurs within the strictures of immutable metagenres: while further subgenre classification is encouraged, Jekyll staff have delineated 48 ‘official’ metagenres, of which all releases are required to belong to at least one, illuminating Jekyll’s hierarchical theory of genre, in which subgenres, no matter how recombinatory and complex, are always subservient to a higher classification. This administration of genre taxonomy shows how music itself is governed on Jekyll. Next, I comparatively examine three social formations that have become attached to genres—specifically, ambient, indie, and classical—paying particular attention to the varying levels of communal hierarchy and ‘insider’ status, the importance of highly specialized generic literacy, and the role of musical ‘discovery’ and circulation for the maintenance of the community. Last, I use findings from these three examples of genre communities to examine the processes of canonization through the ‘Genre Introduction’ collages that function to reify the tastes and literacies of the communities’ most prestigious users, resulting in the elevation of particular works as exemplars of generic formations.

Genre classification on Jekyll relies on a user-generated tagging system, a common feature of Web 2.0 design and social music services such as Last.fm. During the torrent upload process, the contributor must enter several different metadata fields for the

index, including release year, title, artist, and ‘tags’. Jekyll provides 58 official music tags: 48 genres and 10 decade tags. When unofficial or ‘user’ tags, are used, at least one official tag is also required. For instance, if uploading a dancehall record, users typically use the tags ‘reggae, dancehall’, or ‘world.music, dancehall’. In this example, the official tags ‘reggae’ and ‘world.music’ serve as meta-genres: while not fulfilling the uploaders’ obligation to accurately classify the release, they are used to maintain the hierarchy of the genre tagging systems, classifying dancehall as a subgenre of reggae.

The tagging system on Jekyll is deployed in a manner that recognizes the hybridity of genres themselves. By not restricting the categorization to single genres, the classification practices of contributors become recombinatory and a form of creative judgment. For instance, the 2008 self-titled album by New Zealand musical-comedy duo Flight of the Conchords is tagged ‘rock, parody, world.music, comedy, humor, dancehall, funk, country, folk, synthpop, folk.rock, electronic, soul, pop.rock, hip.hop, pop, humour’. Here, the genre tagging system notes secondary generic characteristics that speak to particular musical elements. Similarly, artists frequently cited as performing across genres, such as Radiohead (a particularly popular group on Jekyll), have as many as 11 tags on a single release: their popular 1997 album *OK Computer* is tagged ‘rock, british, art.rock, britpop, alternative.rock, alternative, acoustic, electronic, progressive.rock, experimental, 1990s’. This is evidence that Jekyll participants believe individual generic markers do not adequately describe certain musical releases.

Conversely, many releases are accepted with only single genre indicators: hip.hop is particularly often encountered as a standalone tag. Hip-hop subgenres that are widely accepted on other online music platforms, such as ‘turntablism’, ‘chopped and screwed’,

and ‘West Coast’, are rarely used tags on Jekyll. Kanye West’s 2013 album *Yeezus*, one of Jekyll’s most downloaded releases of all time, is simply marked ‘2010s, hip.hop’. Despite the diverse range of influences on the album’s production, the lack of subgenre tags on hip-hop music suggests genre-specific divergences in approaches to classification. Further, this is evidence that despite hip-hop’s popularity on Jekyll, there is also a belief that it is somehow generically simpler, and that the ‘hip.hop’ meta-genre is sufficiently precise. Compared to the almost obsessive level of generic classification practices elsewhere on Jekyll, hip-hop’s comparative lack of subgenres on Jekyll is particularly striking.

All users are able to add a suggested tag to a release with the ‘Add Tag’ utility. This enters the genre tag into the ‘tag voting’ system that affords members the option to vote on the appropriateness of each tags. For instance, if the aforementioned Kanye West album is defaced with an inappropriate tag, such as ‘boring’, or an inaccurate tag, such as ‘country’, users can vote against the tag’s placement.⁵⁴ The order in which tags on a release are displayed is derived from the number of votes each tag has received, allowing the community at large to determine the relevance of each classification. This is also a non-specialised type of collective knowledge, as the members voting on genre tags do not necessarily hold high levels of genre knowledge. Jekyll’s tagging system affords a powerful method for browsing and consuming music, as, for example, filtering all torrents marked ‘1970s, electronic, ambient, guitar’ produces much more specific results than a generic search for ‘ambient’. Thus, crowdsourcing is deployed to nuance and qualify the official meta-genre categories.

⁵⁴ Elites and above are always able to edit the index, including the power to remove genre tags entirely.

The most interesting development during fieldwork regarding the tagging system relates to the field of genres referred to as hardcore. Two subgenres, one originating in European rave cultures in the 1990s, the other emerging from punk subcultures in the late 1970s, are both commonly referred to as ‘hardcore’. Jekyll torrent moderators announced that the official tag ‘hardcore’ was no longer permitted, and all new releases were to conform to either ‘hardcore.dance’ or ‘hardcore.punk’. Participants were asked to assist in reviewing and correcting the existing torrents, choosing whether the appropriate tag for the upload was ‘hardcore.dance’, ‘hardcore.punk’, or removing the hardcore designation completely. Several types of criteria were provided to assist in distinguishing between hardcore punk and dance, beginning with accompanying tags. Releases with ‘hardcore’ and ‘gabba’ tags were likely to be marked ‘hardcore.dance’, while ‘hardcore’ and ‘alternative’ almost always fitted within ‘hardcore.punk’. Altogether, somewhere between 20,000 and 30,000 torrents were affected, and at least 3,000 releases required further examination. Participants in the collaborative Editing project were asked to investigate either by researching the release itself— for instance, looking up the record label and the genres with which it was associated, as well as the artist’s classification on music databases Discogs or Allmusic—or by determining its generic relations by aesthetic judgment. This could involve critical listening, looking for instrumentation and vocal stylings unique to the convention of the respective genres, or even considering the album art, as guidelines were provided regarding the respective generic conventions in regards to graphic design, typography and art direction. The project was completed in less than a week and involved the efforts of several dozen members, an incredible

example of the high investments of labour made in collaborative classification and editing projects.

Genre Introduction Collages

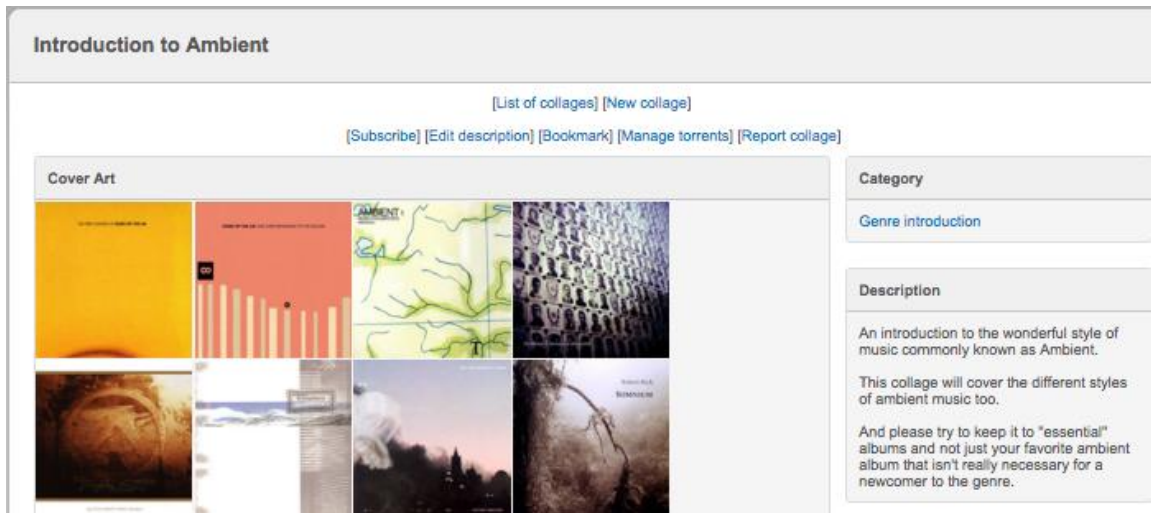


Figure 15. A portion of the Ambient Genre Introduction collage.

Music genres on Jekyll are informally taxonomised within the collage system, a Jekyll utility that offers users the ability to curate and publish a selection of 'related' releases based on particular themes, in many ways reminiscent of a playlist constructed of albums. One kind of collage of particular importance to genre communities are the 'Genre Introduction' collages, which purport to assemble the most 'essential' or representative works for a given genre. This is for the stated purpose of offering outsiders of the connected genre community a simplified path into appreciating and gaining familiarity with an unexplored genre. Any Jekyll member who identifies a genre lacking an Introduction collage is permitted to build a collage and submit it to moderators for

approval. Once a collage is published, it remains the definitive introduction to that genre, and no additional Introduction collages for that genre will be accepted. Figure 15 above shows the first eight selections displayed as a collection of album art icons from the Ambient Genre Introduction collage. These collages exist on a spectrum of scope and comprehensiveness, with no distinctions drawn between subgenres (or so-called ‘microgenres’) and meta-genres. ‘Dirty South Hip-hop’ and ‘Essential Jazz’ are both instances of Genre Introduction collages on Jekyll.

Staff-sanctioned Genre Introduction collages expose a tension between the circulation of musical literacies and processes of canonization, delineating the inherently ‘inessential’ constitutive outside of ‘essential’ music. While the genre tag system was previously described as a deferral to consensus, calculated from a voting utility open to all members, modifying collages is a class-restricted privilege: after a Genre Introduction collage has been staff-approved, only Elites and above may edit it. In practice, typically only the most senior and respected members of a genre community (described in the subsequent section) are involved in selecting the works that are claimed to represent the salient characteristic of any particular genre. Rather than a deferral to consensus, Genre Introduction collages are indicative of a deferral to authority, marked by the prestige economy of the user class system. This acquiescence in the control of genre-based canon formations being in the hands of the tracker's most powerful members has ramifications beyond the hierarchization of musical literacies. Due to these limitations on contribution, Genre Introduction collages are relatively static and unchanging over time, compared to other collaboratively-curated themed collages. Philip Bohlman, considering the repertoires of folk musician communities, writes:

Folk music canons form as a result of the cultural choices of a community or group. These choices communicate the group's aesthetic decisions [. . .] [and] thus emphasizes the internal motivations for cultural expression. [. . .] Canons bear witness to [the group's] values and provide a critical construct for understanding the ways the community sorts out its own musical activities and repertoires. [. . .] Folk music canons therefore articulate cultural values both diachronically and synchronically.

Bohlman 1998, 105; emphasis added

Will Straw's work on the temporalities of music scenes mirrors this sentiment, arguing that 'the "logic" of a particular musical culture is a function of the way in which value is constructed within them relative to the passing of time' (Straw 1991, 374). While the genre tagging system is fluid and open to evolutions in artistic practice or taxonomic conventions (i.e., if a tag no longer suits the artist or release, users can vote to remove it), the rigidity of Genre Introduction collages standardizes canons instead of a more communally negotiated modes of canonization. In this way, Genre Introduction collages directly relate to Antti-Ville Kärjä's reading of popular music canon formation as inherently unequal, involving a processual negotiation of power relations and the elevation of particular tastes, and perspectives over others (Kärjä 2006, 17). Genre tags show the movement between Jekyll's bottom-up and top-down practices and socialities, testifying to the vitality and co-existence of both.

Genre Communities

Over the 7 years of Jekyll's existence, distinct subcultural formations have materialized around particular genres, separate from the genre tag system described above, but involved in the curation of Genre Introduction collages. These 'genre communities' are organized within dedicated IRC channels, forum discussion threads,

and alternative social spaces outside the Jekyll ecology, such as private wikis containing lists of ‘members’ and community history, as well as last.fm groups and group accounts on the now-defunct social listening service turntable.fm. This section focuses on three representative genre communities, namely indie, ambient, and classical, and it presents a comparative account of their social, musical and circulatory characteristics. It also captures the intrinsically musical nature of Jekyll social relations. Georgina Born’s model of music’s social mediation is useful in showing the ‘plural and distributed materiality’ of genre communities (Born 2011b, 377). Born writes: ‘[music’s] multiple simultaneous forms of existence – as sonic trace, discursive exegesis [etc.] – indicate the necessity of conceiving of the musical object as a constellation of mediations’ (ibid.). This section adopts Born’s concept of ‘musically imagined communities’ that ‘generate purely fantasized identifications, or prefigure emergent identity formations by forging novel social alliances’ (ibid., 381). Musically imagined communities are particularly evident in internet-based music socialities, in which music is generative of affect attachments, despite the ‘virtuality’ of online social practices. Following the rich social life of genre communities is suggestive of a constellation of mediations, with various intersections of taste, prestige, and sociality emerging. Genre communities entail vibrant microsocial musical discourse, as well as dyadic and communal exchange. They also offer an opportunity to address the power dynamics of influential community members as tastemakers, which links the genre introduction collages to Born’s ‘institutional forms that provide the grounds for [music’s] production, reproduction and transformation’ (ibid., 378).

Indie

‘Indie’ music, and the social formations its circulation engendered, provides the most exceptional and elaborate example of a genre community. Jekyll’s predecessor, OiNk, was largely oriented towards the distribution of indie, a loosely defined metagenre that no longer refers to the political economy of a music scene; rather, indie is understood as indicative of particular aesthetic realms.⁵⁵ After OiNk’s closure, Jekyll’s early members primarily came from OiNK. These members tended to be interested in indie rock, and the most heavily circulated releases within the first several years of Jekyll’s existence were tagged ‘indie’. Despite the predominance of indie music within Jekyll, a distinctive community emerged within the #indie IRC channel, quickly becoming the most popular genre-specific channel. This is despite the presence of several social spaces for general musical discussion, where one might expect Jekyll’s most popular genre to be discussed.

Between 2007 and 2010, #indie became known within Jekyll as one of its most active social spaces for ‘hanging out’,⁵⁶ as well as the first self-described genre community with a core group of well over one hundred highly involved participants. The indie community produced a collaborative Internet radio programme (primarily broadcasting to its own participants), and a blog to keep members informed of new music

⁵⁵ While it is outside the scope of this thesis to comprehensively analyse what social and aesthetic criteria constitute ‘indie’ within Jekyll, it is important to reiterate that the Indie community is not assembled around an easily definable genre. Its most lauded releases include rock, electronica, pop, and hip-hop. Releases tagged ‘indie’ are associated with a spectrum of cultural industry forces, from obscure independent labels adhering to a DIY sensibility all the way to ‘Big 4’ major labels: even globally mainstream popular artists such as Justin Timberlake are often discussed within the indie community. For a Bourdieuan consideration of symbolic capital and ‘indie’, see Hibbett 2005.

⁵⁶ Much of the early literature on digital socialities and ‘netnographies’ focused on these online spaces for ‘hanging out’ (see Kendall 2002).

recommendations and social events potentially missed while not logged into the IRC channel. The indie community's polymedia presence later grew to include a last.fm group, a tumblr page, and a Twitter account for announcing its communal musical selections and sharing excerpts of discourse from IRC logs. #indie was known for being friendly and less hierarchical than the rest of Jekyll, offering a 'recruitment' thread on the forums and encouraging all Jekyll members to join, even regardless of aesthetic preferences.

Looking at growth over time, the Indie community differs from the other communities, offering compelling insight into the lifespan of genre communities. The indie community's period of highest activity had significantly tapered off by 2013. While indie was the most popular genre subculture in Jekyll's early years, by the time I began fieldwork, Jekyll was much more musically diverse, with hip-hop and electronica being equally as popular on the tracker. Similarly, the Indie community's influence, activity and 'membership' began to dwindle slowly after its peak two to three years after its creation. For a brief period of time, the #indie channel itself was actually disbanded, as its founder went offline for a significant period of time due to 'IRL' concerns, and the IRC server automatically purged #indie from the channel list. Two of the Indie community's most prominent members restarted the channel and contacted past members to gauge interest in continuing their communal activities. The Indie community subsequently reformed as a less active but still notable genre community, reduced in size by roughly half from its peak. Nonetheless, #indie remains the most discursively active genre-focused IRC channel, although the majority of messages posted have little to nothing to do with music. The channel primarily serves as a space for discussing everyday life

between its most dedicated and long-term 30-40 members (with significantly more members contributing occasionally), offering a comparatively congenial environment for participants, some of which had been in contact for many years. The interpersonal connections, ‘insider’ knowledge, and genuine friendships contained within the Indie community are unrivaled by any other space within Jekyll.

Classical

The Classical community is perhaps the most clearly delineated genre community on Jekyll, as the community is quite small but distinctly focused on the curation of musical knowledge. The Classical Community is formed of six to ten ‘senior’ members, approximately twenty ‘regulars’, and occasional contributions and questions from a much larger periphery of less committed participants. The Classical community is almost entirely concerned with cultivating a broadly ‘comprehensive’ catalogue of classical music on Jekyll. An informant and Classical community participant, KF, told me that he believed that Western art music was the most well-organized genre in the Jekyll index, largely due to the efforts of 25 to 30 members.

In addition to the substantial undertaking of uploading many of the tracker’s classical releases — a genre which is represented in over 60,000 torrents — the Classical community is notable for its multiple collaborative projects. These include the composition of long-form (i.e., roughly 5,000 word) written introductions to Classical music for beginners, and a series of several hundred collages, which offer the ability to sort and categorize Classical torrents by style (i.e., ‘Futurism: The Coming of Machinery’, ‘Religious Medieval Monody’), historic period (i.e., ‘In the Long Long Ago:

Ancient Music'), form (i.e., 'Romantic Piano Trios'), arrangement ('The Clarinet Collage'), performers and conductors (i.e., 'Glenn Gould'), composers (i.e., 'Bach and Sons'),⁵⁷ and record label (i.e., 'Teldec/ Telefunken'). Other themed collages focus on specific works, such as collecting performances of Schubert's *Winterreise*, collections of books on the subject of Western art music, or themed criteria such as 'Christmas in Early, Classical and Folk Music'. Undoubtedly, the depth of knowledge required for these collections, as well as the investment of curatorial labour, are among the most impressive and unexpected findings of Jekyll culture, illuminating the extent of the Classical community's commitment to the circulation of music and musical literacy.

Unlike the intimate social relations formed within the Indie community, the Classical community is not discussion-heavy. The Classical community on the forums is devoid of non-musical discussion, and my informant and Classical community participant KF describes the community exclusively in terms of curation. In this sense, this community of interest is closely bound to the shared affinities of participants: all interpersonal relationships are formed through curatorial collaboration.

Ambient

The social formations assembled around ambient music and several affiliated subgenres (primarily drone, downtempo, and ambient techno) are emblematic of the most unplanned type of genre communities on Jekyll. I define the Ambient community here

⁵⁷ It is of interest that composer collages are by far the least common form of collage in the Classical community. This is due to a technical innovation in the Jekyll index codebase, which allows for users uploading classical releases to list the composer, performer(s), and conductor in separate metadata fields, an affordance which OiNk and other earlier trackers did not possess. Jekyll users are thus able to sort the index by composer, mostly negating the need to curate collages for this purpose.

etically, as it, along with several other Jekyll genre communities, does not attempt to identify itself as a community. Unlike the Indie and Classical genre communities, the Ambient community exists entirely within a single forum thread (spanning multiple years and many thousands of posts), along with several collaboratively-edited collages. Despite this lack of signifiers that mark the social formations of other genre communities, the Ambient community exemplifies the potential for communality within a single genre-themed thread on the forums. This also shows how musical discourse on Jekyll animates musically imagined communities.

The Ambient thread, with a start date over two years prior to the commencement of fieldwork, was begun with the primary intention of generating an ‘essential works’ list for the Ambient genre. Canonical ambient works such as Brian Eno – *Ambient 1: Music For Airports* (1978), Aphex Twin – *Selected Ambient Works, Volume II* (1994), and Tangerine Dream – *Phaedra* (1974), were the first to be chosen. Multiple participants contributed additional selections and discussed the relative merits of particular releases, and these choices were soon compiled into a Genre Introduction collage. After the completion of this curatorial project, the focus of the thread shifted from the identification of canonical ambient releases towards discussing new ambient releases, along with a secondary discussion of ambient-oriented record labels. A core group of roughly 30 users (with other occasional contributors) regularly post their most recent discoveries that they consider particularly helpful for ambient music aficionados, as the shared releases are rarely covered by relevant music journalism publications. Blogs such as Headphone Commune regularly cover the genre’s most prominent contemporary artists, such as William Basinski, Max Richter, Tim Hecker, and Steve Roach. However,

the Ambient community's collective tastes drifted from the canonical center of the genre, with particular interests in identifying and promoting unheralded artists, including several ambient artists from Jekyll's own HV collective.

Participants in the Ambient thread constitute a genre community in much the same way as the Indie or Classical communities. The collective discovery, recommendation and discursive practices engender social relations and shape the collective's preference for amateur and underground ambient music production.⁵⁸ In large part due to the multiple years spent discussing common interests, the primary participants in the Ambient community have become closely connected, with discussions weaving together personal details and aesthetic criticism. The community's preference for underground ambient also informs the recommendations circulated among non-Ambient community participants, as many 'outsiders' use the Ambient thread to discover the community's recent favorites.

Genre and the Social

The three genre communities selected for comparison—Indie, Classical and Ambient—were chosen in part because they are three of the most distinctive and active generic social formations, but also because they illustrate a crucial point about the mutual mediation of music and the social. The following quote from Born exemplifies this approach to reading the mutual mediation of music and the social through genre theory:

⁵⁸ I also note aesthetic trends within the Ambient community's most recommended releases. Preferred attributes include bass-heavy drones, field recordings, and noise music and *musique concrete* influences, while minimal neo-classical piano motifs (in the vein of Max Richter and Library Tapes, two widely popular ambient artists) appeared less frequently.

It is by analysing genre as entailing a mutual mediation between two self-organizing historical entities – musical formations (on the one hand) and social identity formations (on the other) – that we can grasp the way that wider social identity formations are refracted in music, and that musical genres entangle themselves in evolving social formations. In this analysis, both musical and social identity formations are conceived as being in process of becoming; both are reliant on the collective production of memory as well as the anticipation of futures. In other words, genre is understood as a radically contingent and material process – one that is, however, oriented to the production of teleology and thus the erasure of its own contingency.

Born 2011b, 384

Genre communities articulate participants' collective understandings of the processual nature of taxonomy that defines genres. The genre tagging system is an exemplary instance of 'genre-in-formation' (Born 2010, 192). Likewise, we can trace the evolution of the Indie community from a collective borne of shared musical affinities to a more intimate sociality, in which 'indie' comes to signify something largely different from its original meaning. This can be contrasted with the static form of Genre Introduction collages, which in most cases are controlled by a single participant: the Ambient Community's collective control over the Ambient Genre Introduction collage is only due to the author's participation in the Ambient community. In most other cases, Genre Introduction collages are curated by a single member, and the sole authorship of these important collages elevate individual taxonomic perspectives over others. Consequently, a significant number of 'alternative canons' (Kärjä 2006) have been produced within Jekyll in the form of 'personal' genre collages, which circumvent individuals' inability to modify the 'official' canon by communicating a different perspective on essential genre releases, and thereby registering their dissent from the 'official' canon.

In addition, each of the three genre communities exhibits certain dominant values, evident in their practices and discourse. Genre communities' priorities, outlined in the

chart below, relate to material features of the musical genres in circulation. In each of these three genre communities, the prioritized communal value is directly linked to the way in which each genre is circulated, consumed, and discussed.

	Indie	Ambient	Classical
Literacy	Least	Medium	Most
Circulation of New Releases	Medium	Most	Least
Communal Sociality	Most	Medium	Least

Figure 16. Hierarchy of Communal Priorities

Within #indie, the social relations between long-term members has become the clear central purpose of the community. Discovering and discussing new ambient releases is of primary importance to the Ambient community. Lastly, the Classical Community is primarily concerned with producing collages and curating musical knowledge. While this formulation is somewhat reductive—there are other qualities that could be contrasted, such as inclusivity, tone, demographics, and so forth—I nonetheless contend that this tells us something of considerable importance about genre and the social within Jekyll.

For the Indie community, the decline in the communal prioritization of music circulation mirrors the gradual decrease in popularity of the indie rock aesthetic that dominated the first several years of Jekyll torrent activity. Similarly, the abundance of music criticism and fan-produced literature regarding indie music, from publications such as Pitchfork, music blog aggregator Hype Machine, and even SNS such as last.fm, negated much of the need for the community to extensively curate guides to indie music.

While interest in indie music itself may have dwindled, the social relations engendered by the practices formed around its circulation have not. While the social behaviors evolved to encompass a range of rituals and inside jokes not directly related to music circulation, #indie is still influenced by its historical beginnings, in which this musically imagined community existed due to the shared musical affinities of its members.

In regards to the Ambient community, its defining attribute is the sheer number of releases its participants have uploaded into circulation on Jekyll. The majority of Jekyll's ambient releases are distributed by small net labels and independent artists, and outside of the Ambient community, there are few resources for ambient music discovery. Moreover, unlike 'indie', ambient remains a very lively and active genre with numerous new releases. As the canonical works of the Ambient genre are relatively well established and uncontested within the Ambient community, its members have focused their communal efforts on discovering and circulating new releases by lesser-known artists.

Lastly, the Classical community prioritizes knowledge dissemination and curation of particular generic characteristics, largely because the dynamics of discovery within the classical music canon is tempered. Musical appreciation is primarily focused on relatively established composers. While the composers and works constituting the classical canon has a prodigious literature from musicology and music criticism, this body of work is mostly unrepresented in file-sharing cultures. The Classical community sees their role as translating the cultural authority of classical musical knowledge into the file-sharing scene, a type of collective pedagogical vocation. In service of this, the Jekyll Classical community has produced the most comprehensive guide to exploring and understanding Western art music that I have encountered within a file-sharing system, certainly

surpassing the classical playlists available on Spotify. The Classical community's pedagogical vocation is reminiscent of Lawrence Levin's (1988) characterization of highbrow connoisseurship in terms of its attempts to extend classical music 'to the masses'.

Conclusion

In this chapter, I have considered the musicality of Jekyll communality, showing how smaller, more intimate and specialized social groupings exist within Jekyll. HV and the genre communities exemplify Born's work on music's social mediations with regards to the animation of musically imagined communities (2011b). These formations are crucial in theorizing the social organization of file-sharing, recognizing that musically imagined communities are formed at multiple scales, are nested within each other, and may overlap each other. With over 150,000 members hailing from dozens of countries with significant cultural differences, Jekyll is too large to exist as a singular community. Nonetheless, this lack of true cohesion is still understood by participants as a unified whole that informants routinely called the 'Jekyll community'. I have shown how the Jekyll imagined community consists of nested, smaller-scale 'communities of interest', oriented around specific aspects of musical experience online. These include the genre communities but also other groupings, such as the interview teams, editing teams, and PU+ classes, along with other, less formalized groupings. Highly involved Jekyll members invariably belonged to and participated in these smaller communities of interest, while more casual informants, who spoke about the site purely in terms of musical acquisition, did not involve themselves in such groups. As such, unpacking the

socialities of Jekyll necessitates parsing out the unique traits of these nested socialities, productively aligning with Kelty's (2008) work on recursive publics. Similarly, Jekyll communality depends on the smaller, constituent communities that exist within Jekyll, which upwardly inform the broader social dynamics of the entire site. Communality is formed through participation in various aspects of the tracker. For my key informant KF, this entailed active participation in several genre communities, editing projects, ongoing forum discussions, and curating collaborative collages.

The social nature of genre on Jekyll also provides evidence for one of the key themes of my research, namely the manner in which networks of music circulation are constructed by participants, while these systems simultaneously enact processes of 'configuring the user' (Woolgar 1990), shaping not only consumption practices but also notions of taste, quality and aesthetic judgment. Genre communities are evidence of the constructive potential of participation, creating new social relations through circulation and shared musical affinities. Nonetheless, genre is also deployed in top-down, prescriptive manners, another aspect of its systematized governance over both musical objects and individual subjects, requiring the aesthetic judgments of users to conform to predefined standards of musical identity and classification. The dictation of 48 'official' genres is the strong way music classification is administered on Jekyll. The 'hardcore' editing project also encapsulates how Jekyll depends on the collective musical knowledge of the community to construct a rational and ordered musical index, yet rejects the expressive or exploratory potential of 'hardcore' as a descriptive modifier of 'other' music. This is one articulation of the formalization of an informal musical economy, something I pursue in greater depth in Chapter 8.

We have now seen that Jekyll contains a web of socialities, existing at different scales and degrees of participation. Across Chapters 3, 5 and 6, we see how social relations are richly interwoven into the overall experience of Jekyll music circulation. The next chapter shifts focus from Jekyll to Spotify, addressing the limited nature of its social features, and contrasting them to the vibrant socialities of Jekyll.

Chapter Seven: Social Formations in an Individuated Music Platform: The Design of Spotify Sociality

In this chapter, I examine how Spotify attempts to simulate the social formations of unlicensed digital circulation within a formal, commercial music consumption system. As a multinational commercial platform proffering individuated, rental-based consumption, the socialities configured by Spotify are more elusive to ethnographically capture than Jekyll's. Spotify's mode of address to consumers is highly individuated via a streaming interface that imitates the personal music library format. In the chapter, the comparison between Spotify and Jekyll becomes important and insightful. In marked contrast to Jekyll, collectivity is not present in Spotify, which marks a shift from the collective to the individuated and dyadic. Indeed, in comparison with Jekyll, reciprocal circulation and the socialities based on musical and curatorial contribution are curtailed. Therefore, much of Spotify's 'social' design is simulated, and the socialities that do exist are reduced in scope. While most of the close ethnographic observations of playlist sociality and exchange will be examined in Chapter 8, the chapter offers an analysis of the social and technical design of Spotify participation.

A core finding of my fieldwork is that this audience contribution—a digital strategy commonly referred to as crowdsourcing (Brabham 2013; Wexler 2011)—along with the socialities engendered around playlist curation and sharing are at once key sources of the pleasure generated by Spotify music consumption. Crowdsourcing is elicited by the platform's design, another form of governance by technical design, which is examined further in Chapter 9. Users' actual engagements with Spotify are diverse and do not always conform to what is expected or encouraged, at times demonstrating the rich

musical literacies and multitude of music consumption practices. Informants often describe their use of Spotify in terms of individual listening, organization of their music collection, or intimate interpersonal communication, sometimes ignoring or attempting to disable all ‘social’ features of the service. Nonetheless, Spotify is invariably deemed by its users to be offering what is called ‘social’ music consumption. The chapter first addresses the social formations of Spotify, finding that audience publics exist in a limited capacity. It also notes the existence of dyadic exchanges, which can become chained through Spotify’s social design. It then addresses the role genre plays on the platform, comparing this to the richly social Jekyll genre communities shown in the previous chapter. It then analyses the platform’s individuated design by examining how Spotify user experience is shaped by technologies of enchantment.

Spotify Musical Publics

In this section, I attempt to illuminate the social components of Spotify towards a more accurate understanding of what these groupings and publics can be said to represent. First, the term ‘musical public’ itself must be qualified. Musical publics here are audience assemblages that constitute themselves around music (Born 2013, 35-37). On Spotify, due to its individuated mode of address, this is most similar to the publics engendered by media consumption, such as a newspaper’s subscribers: these publics are animated ‘by virtue of being addressed’, and do not communicate directly (Warner 2002, 67).⁵⁹ However, the participatory dynamics of Spotify music consumption, particularly as found in the public playlist system, means that Spotify’s users may engage in limited

⁵⁹ For more on audiences and publics, see Livingstone 2005; Ochoa Gautier 2012.

forms of musical expression that are shared with ‘strangers’ within the platform. Nonetheless, these public musical practices do not constitute ‘affective alliances’ (Straw 1991, 374) and can be contrasted with the rich musically imagined communities found within Jekyll in Chapter 6. Jekyll is not a musical public primarily because it is richly interactive and allows for multipolar connections: any Jekyll participant can address the totality and can be addressed in return. Spotify’s publics, as I will show, primarily consist of webs of dyadic exchanges and microsocial relations, and limit the ability of participants to collectively define themselves.

Spotify does generate a limited and regulated set of characteristic socialities because music-based social interactions are designed into the platform. This is achieved by integrating elements of external commercial SNSs—notably Facebook—into the platform.⁶⁰ Unlike most SNSs, which encourage individuals to expand their virtual ‘social network’ through snowballing existing connections, Spotify favours dyadic relationships in which users interact with existing friends, enabled by the alliance with Facebook. Likewise, Spotify also encourages ‘following’ users with shared musical interests, thus incorporating features of ‘taste-based SNSs’ like last.fm (Baym and Ledbetter 2009). The new virtual musical friendships orchestrated by Spotify are developed through users’ creation and consumption of publicly shared, online playlists. Playlists are an implementation of a ‘user-generated content’ model in which customers are invited to participate in the curation and ‘creation’ of the very commodities they are subscribing to consume (Jenkins 2006; van Dijck 2009). Indeed, the curation of

⁶⁰ Social network sites (SNS) can be defined as ‘web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system’ (boyd and Ellison 2007; 211).

playlists—whether assembled collaboratively with friends, curated individually for public consumption, or developed for private use—is simultaneously the primary genesis of Spotify socialities, a key practice in Spotify’s devolved organisation and circulation of both music and musical knowledge, and the main driver for its configuration of audience labour.

Next, I advance a definition of Spotify’s model of musical-social networking as a ‘second-order’ social networking site in order to highlight the function of social relations on the platform. Here, I define second-order SNS in relation to conventional, ‘first-order’ SNS (i.e., Facebook, Twitter), in which social relations are of primary importance, and the sharing of digital objects are a mechanism by which these social relations are animated. In second-order SNS like Spotify, social features play a complementary role, supporting an experience that is primarily not about connecting with friends.⁶¹

Facebook’s social networking affordances are advertised on its login page, offering the user the opportunity to ‘connect with friends and the world around you on Facebook’ (see Fuchs 2014 for further examples). Spotify has published multiple public relations statements and advertising materials that describe the platform as offering musical experiences enriched by the presence of others. The mission statement as of 2014, ‘Music for Everyone’, along with the Spotify Social banner ad ‘Music Brings Us Together’ shown in Chapter 3, implies Spotify’s totalizing aspirations, as well as the engendering of musical publics through the platform.

⁶¹ This conception of ‘second-order’ SNS is broadly applicable to ‘social web’ services that depend on ‘first-order’ SNS integration. These range from news organizations that use Facebook Connect to handle comment sections, to media content providers such as BuzzFeed that rely on SNS to circulate their content.

Despite these suggestions of a communal music experience, it is difficult to form musically imagined communities within the platform. In contrast to Jekyll, no functions allow for groups of individuals to define themselves as a collective. Spotify's defunct music chat room service Soundrop (addressed in Chapter 3), which afforded communal listening and music discourse, was discontinued during fieldwork. Soundrop's removal is of particular interest because it appeared to be the clearest 'social space' within the Spotify platform: it not only offered a space for musical discourse, but also allowed participants to collectively decide the music 'tracklist' for the chat room. The discussions I observed were often richly social, with participants addressing one another by name and weaving together everyday and musical discussion. These findings can be directly compared to Jekyll musical discourse in IRC chat, where music leads to affective alliances and close social relations. Without any such social features in Spotify now, it must be fully considered a second-order SNS. Social networking sites typically '[. . .] function as social venues in which many different communities may form', but it is doubtful that Spotify fits this description of social media (Parks 2011, 105). I turn now to the literature on social networking sites for insight into the nature of the social formations within Spotify.

Nancy Baym's *Personal Connections in the Digital Age* (2010) offers several productive routes into unpacking the group formations of SNS. Baym identifies five 'communal' qualities of online socialities: 'sense of space', 'shared practices', 'shared resources and support', 'shared identities', and 'interpersonal relationships' (Baym 2010, 75). As a proprietary platform, Spotify is a bounded space. Spotify musical practices are limited to this space, unlike unlicensed file-sharing, in which music files can be moved

between platforms and remediated. To the extent that users say ‘I am on Spotify’, Spotify is indeed a sociomusical ‘place’ of sorts. ‘Shared resources and practices’ are the primary indicators of Spotify sociality. Spotify sociality is animated by relations formed over shared ‘resources’ (i.e., playlist creation and circulation), as well as ‘practices’ (i.e., curation, library organization, music discovery methods, etc.). The musical publics animated by these practices, as described in Chapter 3, are the most ‘social’ aspects of music circulation on Spotify, but ‘shared identities’ and ‘interpersonal relationships’ are also both present in Spotify. The connection of Facebook accounts to Spotify leads to music consumption being directly linked to identity formation on Facebook (see Kant 2015). Interpersonal relationships are also enacted through the private messaging of music and collaborative curation of playlists. Music consumption on Spotify is social in these ways, yet throughout fieldwork I did not find forms of sociality or collectivity comparable to Jekyll’s.

Two of Baym’s seven points for comparing digital media are also useful for the comparative analysis of Spotify and Jekyll communality, namely interactivity and temporal structure (2010, 51). Interactivity here can be understood as technological malleability, referring to the manner in which the platform is open to user adaptation, feedback and control. The level of interactive control is a powerful point of contrast between Spotify and Jekyll. Spotify’s individuated experience offers the appearance of control and personalization, but the platform itself is of closed-source design and is not adaptable by its users. Jekyll, on the other hand, may be a highly governed platform, but its own members nonetheless generate it. Individuals’ sense of personal investment in the creation and maintenance of the platform is integral in creating communality, a point

further argued in Chapter 11. The temporal structure also offers a useful point of comparison. Spotify's 'on-demand' streaming system reduces the temporal gap between musical choice and listening experience to a synchronous experience. Jekyll's more complex torrent indexing service is markedly slower, as music playback occurs outside the tracker platform, leading to an asynchronous music listening experience. However, both platforms contain multiple synchronous and asynchronous social functions, complicating analysis of their temporal structure. These include both the Jekyll and Spotify Community forums (asynchronous), Jekyll IRC chat (synchronous), Spotify private messages (asynchronous), and the 'Friend Feed' (synchronous). Nonetheless, in its primary function as a music consumption platform, Spotify offers synchronous listening. However, there is no public, synchronous commenting system, a feature that has engendered communality in one of Spotify's primary competitors, Soundcloud (Reed 2017). This notable absence in Spotify's social features offers evidence that Spotify lacks equivalent socialities.

Along with public playlists, the Friend Feed is the most important feature engendering musical publics within the Spotify platform. The Friend Feed, appearing in the right-hand column of the desktop application, displays a list of friends currently online as well as the song they are listening to at that moment. Whether unknowingly or not, Spotify users are broadcasting their music consumption habits via the Friend Feed. In general, my fieldwork showed that users often forget that their friends can view their currently playing music, and that this can lead to unwitting expressions of musical affinities that users may want to remain private (see Kant 2015). This is exemplified by a conversation I had with informant BL in 2016. I saw from my Friend Feed that BL was

listening to the George Benson song ‘Durham’s Turn’, so I messaged him on Facebook to comment on the title’s inclusion of my last name. BL’s response indicated that he was not pleased with my observation of this listening session, as he was unaware that Friend Feed was ‘on’ at this time. Additionally, he noted that he was listening to a Spotify radio station, which meant he was not selecting the actual songs that were appearing in Friend Feed. He suggested that Friend Feed should only broadcast current listening choices when the user themselves has selected the music.

Friend Feed generates a particular mode of circulation, where users observe their friend’s discoveries, subsequently listen to them, and themselves go on to broadcast this work to other audiences. This chain of dyadic exchanges is similar to what is commonly referred to as ‘networked publics’ in SNS studies (boyd 2008). I nuance this by focusing on the microsocialities existing within these publics, which are continually merging, in transition and crossing over into one other. An anecdotal example of how this functions comes from a discussion with Spotify informant MH. User A (MH) added a song to her library, enjoyed it, and subsequently placed it in a ‘New Finds’ public playlist. A close friend, User B, subscribed to her ‘New Finds’ playlist, and was therefore notified that the playlist has been updated. He clicked the notification, was directed to the ‘New Finds’ playlist, and streamed the newest track. User B’s acquaintance, User C, saw from Friend Feed that User B was listening to an unknown song by a familiar artist, which informed him that the artist has released a new work. He clicked the track title and was taken to the album page, which he immediately added to his library.

This example is representative of multiple social encounters I observed, participated in, and learned about from informant interviews. While the exchange might

be said to be a form of networked exchange between A and C, with B serving as an intermediary, this is not how informants understand the experience. Here, User C felt that he learned about this release from B, even though he was not attempting to inform others about the release. User C felt no connection to User A, despite her role in the chain of circulation. Several informants spoke about discovering new music through the Friend Feed as comparable to a dyadic ‘copresent’ listening session, learning about new music or rediscovering old favorites at the same time as their friends. I contend that shared affinities serve as a form of ‘propinquity’, reasserting each other’s similar interests (Baker 2008). In this way, Spotify consists of a multitude of dyadic exchanges and influences that circulate musical literacies and practices. Nonetheless, this is limited in scope, due to the inability for users to articulate musical discourse beyond the broadcasting of currently playing songs.

Genre on Spotify

In this section, I address how genre is instrumentalised in the formatting of Spotify music circulation. As explored above, Spotify experience is shaped by the practices of other users, yet does not offer resources to facilitate the formation of genre communities. However, social relations formed through similarities in consumption habits do exist, and the webs of social relations built within it revolve primarily around concepts of listener similarity. Similar to Jekyll participants, Spotify users form bonds with others with shared affinities. However, these bonds are often transient and functional, and are less rich than the Jekyll genre communities shown in Chapter 6. Furthermore, Spotify’s categorization of music listening sessions has evolved, with

contextual ‘Moods’, such as ‘Party’, ‘Focus’, and ‘Chill’, supplementing conventional genre categories (see Hagen 2015). Still, genre remains an important analytical route into the interpretation of circulation and consumption practices in Spotify.

I begin with an examination of how genre is built into Spotify. The platform’s limited access to search result filtering, in particular genre filters, suggests a lack of interest in conventional genre browsing utilities. Searching a genre name generates results that match the search term within the song, album, artist name, and playlist title field. Of these, the playlist results (including Spotify-controlled, advertiser-promoted, and user-created) are typically the most relevant to the actual genre searched. The ‘Browse’ system, revamped multiple times through the course of fieldwork, offers the ability to explore music by mood or genre, but the result of choosing a genre is simply a selection of Spotify-curated playlists. Similarly, informants often complained about the lack of variety and ‘adventurousness’ in the ‘genre stations’ within Spotify Radio compared to competing streaming services. Public playlists, especially those whose titles specified the specific genres it contains, are frequently described as the primary form of genre exploration. The breadth of music curation accessible through public playlists is indeed impressive, and is without question one of my informant’s most highly regarded aspects of Spotify service.

The users assembling these ‘genre playlists’ are performing curatorial labour (examined in the following chapter) as folk taxonomists and tastemakers, each putting forward alternate definitions and understandings of particular genres, drawing on and departing from Spotify’s own classifications. This is directly comparable with Jekyll’s ‘official’ and ‘unofficial’ Genre Introduction collages described in Chapter 6, in that both

platforms are involved in defining genres in certain spaces while also leaving open spaces for user-generated curatorial work. My informant EW is representative of influential tastemakers on Spotify. As an avid Spotify user, EW has assembled hundreds of playlists, including dozens of genre playlists, titling each in the format ‘Genre: [x]’ in order to be found easily by search. His personal Spotify account is followed by over five thousand users, and his most popular genre playlist, covering ambient and drone music, is followed by nearly ten thousand listeners. Speaking to EW about his Spotify practices, he explained that he did not intend to become a tastemaker. His genre playlists were originally designed to better organize his library for personal consumption, what he referred to as his ‘organizational breakthroughs’. His popularity on Spotify partially came from his participation in Reddit, the popular social media aggregation site. EW attributed many of his followers to his long-term activity in several electronic music Reddit boards on which he would share relevant playlists within threads about particular artists or genres. Subsequently, as more users followed his playlists, the playlists themselves were more likely to appear as relevant search results within Spotify. EW noted that the primary marker of prestige for tastemakers is the number of followers on their playlists. Although he downplayed the importance of this to his curatorial motivations, his point remains that wide circulation of personal playlists is considered desirable within the platform. This is also a strong polymedia finding, showing how Spotify music circulation is supplemented through the use of other complementary media platforms.

Another informant, HG, is a useful example of a genre tastemaker with a much smaller scope of influence within the Eurodance genre ‘hands up’. HG curates multiple playlists dedicated to this genre and primarily uses Spotify social and discovery features

to seek out new hands up tracks for his playlist. Due to the highly focused nature of his consumption practice, HG's social experience of Spotify is quite different than most others I interviewed. His social relations with other Spotify users were primarily formed with other 'hands up' listeners who followed his playlists to learn about new releases. HG considered himself friends with multiple users with whom he exchanged music and enjoyed these 'social' methods of discovering new music. The primary difference between HG's 'hands up' friends and a genre community is that these 'hands up' socialities are entirely dyadic, where in contrast, genre communities are group formations.

Lastly, we might consider the shaping of platform design by genre. I find that an individual's Spotify consumption practices are often inflected by the historical distribution conventions of their preferred genres. For example, with EDM, the album format is typically of secondary interest and is often eschewed entirely by producers in favour of digitally released singles, a release convention particularly well suited for the playlist format. Spotify VP of Content and Distribution Sachin Doshi stated in an interview that early adopters of Spotify are significantly more likely to listen to EDM, a genre whose demographic makeup broadly coincides with that of technological early adopters (Canon 2014; see also Pedersen 2005, Laukkanen and Pasanen 2008). Listeners of genres where the album format remains the irreducible 'work of art', such as progressive rock and metal, are more likely to create 'album playlists' (i.e., playlists containing full albums), as opposed to mixed playlists, in order to enable the uninterrupted playback of the album. Multiple informants, including key Jekyll informants KF and JS, believe that Spotify was designed with particular modes of

listening in mind, and with emphasis on certain genres, particularly electronica. For these informants, Spotify's focus on playlist curation amounted to the exclusion and denigration of genres focused on long-form albums.⁶²

Social Platforms and Individuated Experience

In this section, I address my usage of the term 'individuation', clarifying its meaning within philosophical discourse in relation to its common usage in media studies. For Nietzsche, the *principium individuationis* is defined as the distinction of one thing from other things, in reference to the boundaries between the individual and the broader world (Nietzsche 1872). The term entered broad usage in psychology due to its fundamental importance to the work of Carl Jung, who defined it as 'the process by which individual beings are being formed and differentiated, [. . .] as a being distinct from the general (Jung 1953, 561). Bernard Stiegler, drawing on the work of Kittler and Gilbert Simondon, considers the technological mediation of individuation, or 'mnemotechnologies', in regards to the mass digitization of information affording an expansion and externalization of memory (Langlois 2014). In each case, individuation casts the nature of subjectivity in relational terms, seeking to understand how individual beings emerge from the collective.

However, the term 'individuated' in media studies often refers to media platforms that are primarily focused on the personalization of content, such that each user's experience of the platform is distinct (see Miller 2009). The meanings of 'individuated'

⁶² During fieldwork, Spotify implemented the 'Your Music' feature, which offers the ability to assemble and arrange a personal collection by Song, Artist, or Album. This reflects my informants' desire for Spotify to better accommodate 'album-oriented' listening.

and ‘individualized’ are conflated here, in that personalization seeks to hide the presence of unwanted content from users. This coincides with an evolution in new media away from conventional market segmentation, which understands (and subsequently casts) consumers into homogenous subgroups, which are targeted as a collective. Individuated approaches, exemplified by video streaming service Netflix, purport to recommend more relevant and apposite media choices for consumers, as the platform learns about each individual’s actual tastes and desires (Bush and Hunt 2011, 221). Individuated design, however, actually entails an intensification of market segmentation, in that recommendation systems calculate what is known about the user against what is known about other yet similar users. In this way, individualized media platforms are individuated by virtue of the relational nature of recommendation systems, wherein personalization is merely a façade obscuring the social entanglements of media design. Jeremy Morris and Devon Power argue that the pursuit of personalization within streaming platforms inevitably leads to further sociological reductionism:

[T]he stream, despite attempts by providers to position it as ever flowing and always on, is just as often an opportunity to separate, segment and differentiate among different levels of consumers, and different groupings of music consumption activities.

Morris and Powers 2015, 13

Individuated consumption is thus relationally defined, with media platforms crafting individual experiences out of the collective, and with individual consumption shaping the recommendations and experiences of others (see Morris 2015; Seaver 2012).

The Formatting of Consumption: Design as Enchantment

With this understanding of individuated experience, I examine the specific design of Spotify individuation further, drawing out further how Spotify can be said to be both

simultaneously *social* and *individuated*. I contend that, due to Spotify's lack of spaces for the assembling of genuine musically imagined communities, the socialities it contains are largely ersatz. Due to this shortcoming, Spotify's technical design contains elements of mystification and enchantment through its cyclical production of 'socially-oriented' musical utilities. Furthermore, Spotify's business model requires that users move from its advertisement-supported 'Free' tier to its 'Premium' subscription and remain long-term renters, leading to development cycles that I characterise as technological 'enchantment'.

To begin, a methodological difficulty of my research speaks to an important challenge in studying digital culture, particularly corporate-backed online platforms. Technologies are constantly in flux, with flows of users joining and leaving, features being implemented and discontinued, modifications to the user interface, and so forth. This can be compared with Spotify, which did have a team of members working on improvements to the site, but remained mostly stable throughout fieldwork. While Jekyll saw small modifications to its design, Spotify saw much more significant change. The company has continued to introduce and discontinue new features, particularly related to modes of musical discovery and organization, not to mention a significant overhaul to the user interface and branding materials. Some of the most intriguing elements of Spotify at the beginning of my research, including the burgeoning availability of third-party applications using Spotify's API, as well as a robust peer-to-peer architecture for reducing internal server load and improving streaming response time, were discontinued as of 2015. In my attempts to capture the specificity of Spotify experience, each change has tended to disrupt my interpretation of the platform.

Informants made frequent reference to how the Spotify user experience changes frequently. MD, a 28 year old administrative assistant who primarily listens to Spotify's algorithmically-generated Radio stations while working or exercising, explains that her satisfaction with Spotify is evaluated based on its ability to offer 'newness': 'when I'm listening to a station, I want it to be consistent [in terms of] genre, but what keeps me engaged is when it consistently offers new experiences. Normally this means playing songs that are new to me. I sometimes feel like [the tracklists] gets too repetitive.' MD finds musical repetition particularly undesirable, as songs that repeatedly play in her stations become too familiar, and thus distracting from the work she is performing. In this way, continually evolving Radio stations afford the 'soundtracking' of everyday life.

Discover Weekly, Spotify's most popular algorithmic recommendation feature, produces a unique thirty-track playlist once a week, based on a sophisticated calculation of recent individual listening trends along with comparable tracks from the listening histories of 'similar listeners' (Popper 2015). Informants often praise Discover Weekly as the most advanced and individualized music recommendation system available. For informant BL, Discover Weekly's cyclical updating cycle represents a key point of pleasure in using Spotify: 'most Monday mornings, I open up Spotify, because I know I'll probably find at least two new songs that I really like from [Discover Weekly]'. The predetermined release schedule of new music recommendations encourages BL to return to the app at particular moments in his weekly routine. However, the platform's frequent design updates represented a point of confusion for him. He explains, 'It feels like just about every time I open [Spotify], there's a blue dot telling me to update. And when I do, I don't necessarily see the changes. Or then sometimes I'll notice that something is

moved, or that a new gray bar is now at the top of the window, and I don't know why they do that'. BL's experience with Spotify's product update cycles suggests that the efficacy of Spotify's technological captivation is not uniform, with some updates inspiring increased usage of the platform, and others leading to apathy or even dissatisfaction.

Another example from fieldwork concerns 'Your Year in Music', the listening data visualization utility described in Chapter 3. My informant MS was fascinated by its results when launched in 2014. The utility, which was only available in December, produced several images displaying the user's key listening statistics. This included the total number of minutes spent listening to music on Spotify and the user's most frequently listened tracks of the year, which could be shared on social media. MS explained that he enjoyed seeing detailed information about his music consumption practices, and throughout 2015, he eagerly anticipated seeing the utility's results. This also affected his music listening choices: as the EDM artists Zedd and Galantis are his two favorite artists, he decided to almost exclusively listen to these two artists throughout November, in order to ensure that their music would be represented on his 'Top Tracks of the Year' image, as seen in Figure 17 below. As an obsessive music listener, MS was particularly prone to being captivated by Spotify's design, expressing strong approval when new features were released. He also was among the most disappointed informants when features were removed, such as the rarely-used 'Touch Preview' feature on mobile phones.

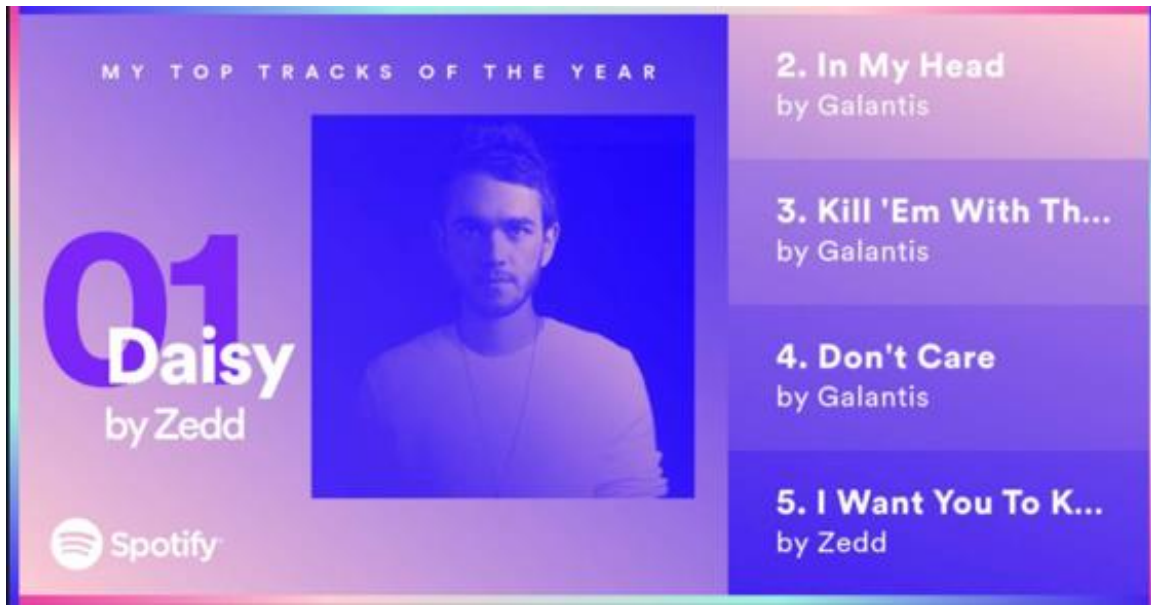


Figure 17. MS's 'Your Year in Music' infographic

These examples of Spotify's constant state of flux point to a key aspect of Spotify's user experience, which I call the 'captivation by novelty', drawing on anthropologist Nick Seaver's work on understanding algorithmic recommendation systems as traps (Seaver 2015). This can be defined as a strategic approach to technological development that prioritizes constant, incremental updates, offering minor shifts in listening experiences as a strategy for brand differentiation in the highly competitive digital music streaming industry. Seaver's model of captivity is based on the work of Alfred Gell (Gell 1992), whose anthropological theory of art casts art and technology as intimately connected to magic. Gell's description of an intricate glue-and-matchstick model of the Salisbury Cathedral, which captivated his younger self, is perhaps his most lucid explication of the relation between technologies of enchantment and the enchantment of technology:

[t]he matchstick model, functioning essentially as an advertisement, is part of a technology of enchantment, but it achieves its effect via the enchantment cast by

its technical means, the manner of its coming into being, or rather, the idea which one forms of its coming into being...

Gell 1992, 47

For Gell, the power of art objects, and by extension technical objects, to enchant viewers or users is based in part on the mystery behind its production. An inability to fully comprehend the processes by which the technical object is formed or how it functions engenders a fascination, or ‘enchantment’, with the object. In Spotify, enchantment comes about through both the ability to curate an individualized experience out of a seemingly infinite library of content. Looking at the trajectory of Spotify’s design, it now positions itself a mediator of musical experiences, moving away from its beginnings as a passive intermediary of digital music distribution. While Spotify launched in 2008 as a ‘lean-forward’ platform of music consumption, offering access to a large streaming library that required active user input to in the form of curating personal playlists, Spotify increasingly focuses on ‘lean-back’ features that automate curatorial labour. New lean-back features include Running, which automatically detects the physical pace of exercise through the sensors in the user’s smartphone and adjusts the song’s tempo to align with the user’s steps, exemplifying the strategy of captivation by novelty. ‘Lean-back’ features are highlighted not because the musical experiences they offer are genuinely novel; rather, they are a part of a branding effort to establish Spotify as a ‘context aware’ technology.

The end goal of contextual awareness is explained by Spotify’s Director of Developer Platform Paul Lamere as what he call the ‘Zero UI’ Project (Lamere 2014). This is an imagined music recommendation system that automatically selects appropriate music based on so-called ‘implicit signals’—data such as track skips, volume

adjustments, and search queries derived from previous listening sessions—that respond to the current context and activity of the listener. Some of the contexts Lamere names as important musical moments in users’ everyday lives include exercising, driving, and studying. The project proposes fully eliminating the need for listener input, envisioning a fully automated music consumption platform. Framed as a solution to the abundance of choice problem, the Zero UI Project is also an effort to reconfigure concepts of individual agency in music circulation. Here, contextual awareness amounts to a fully enchanting technology, one whose powers of inference and selection are so well tuned that the spell over the captivated user is never broken. Natasha Dow Schüll’s (2012) ethnographic account of video poker machines explores the research that goes into developing a technology designed to ‘enchant’ its users. The gambling industry’s shift away from focus group research to usage monitoring and data analysis was driven by the demand for systems that could maintain customer loyalty. The industry had previously attempted to make slot machine gaming more aesthetically engrossing, adding new storyboards, images, and sounds to the gaming experience. With insights derived from usage data analysis, the payout algorithms were adjusted to award small payouts more frequently, which offered the emotional response of success while users still lost money over time on the machine. Schüll quotes an industry informant, who explains that ‘[t]echnology’s role was to “lend a rational analysis of what’s going on in this complicated matrix of choice.”’ (Schüll 2012; 143). Gambling and streaming music industries share an underlying motive: namely, the importance in retaining customers long-term, as profitability in the rentier subscription business model requires low subscriber attrition rate. There are striking similarities to Spotify in Schüll’s account of technological enchantment. Not only

are the user interfaces of both slot machines and Spotify designed with the intention of maximizing user attention, but both are created in dialogue with the ‘streams’ of data derived from user tracking, what Jonathan Crary calls ‘a continuous process of feedback and adjustment’ (Crary 1999, 76, in Schüll 2012).

Following from this, the individuation of consumption is achieved through the systematic and involuntary extraction and use of data derived from users’ listening practices. This form of consumer surveillance amounts to Spotify’s main implementation of Music Information Retrieval (MIR) methodologies, a burgeoning area of applied scientific research that encompasses the automation and systematisation of listening data to feed into music recommendation algorithms.⁶³ It is a governmental technique akin to what Mark Andrejevic has called ‘the work of being watched’ (Andrejevic 2002). Andrejevic examines the labour dynamics of digital market research, where value is captured from monitoring consumer behaviour, and where user accounts function as virtual commodities in the ongoing monetised exchange of marketing data.⁶⁴ The social relations designed by Spotify exploit the same techniques, such that continuous monitoring of users’ listening practices—their affective musical experience—drives the platform’s governance of consumption. In addition to the Friend Feed, the ‘Top Tracks in Your Network’ feature generates an automatically-updated playlist constructed of the

⁶³ MIR research, originally developed in academic music and computer science departments, has grown increasing alliances with commercial interests. Working at the intersection of industry and the neoliberal university, leading research outfits include such bodies as The Centre for Digital Music at Queen Mary, University of London, and music database company Gracenote.

⁶⁴ Indeed, Andrejevic’s prescient view that Napster would have economic value for the music industries because, as a crowdsourced platform, it offered a ready means for monitoring music consumption strikingly prefigures the later contours of Spotify’s design (Andrejevic 2002: 243).

most popular tracks within a user's 'social network'.⁶⁵ These examples of users' enforced participation in the 'socialised' recommendation of music, and thus its intensified circulation and value generation, show how the instrumentalisation of consumption and the platform's socialities are central to Spotify's user experience. Spotify's commercial operations therefore depend on extracting exchange value from the recursive analysis of listening habits and demographic profiles in two ways: most obviously, by targeting advertisements, but also by using new features to accelerate music's circulation among users' now-instrumentalised online social networks.

Spotify's tactics of enchantment resemble a microcosm of rentier capitalism's maintenance of the *status quo* itself, which strives to '[. . .] mak[e] mere modifications appear to promise eventual newness (a tactic that comes to the fore in the ideology of late-capitalism, whose noisily marketed "perpetual revolution" is really just an instance of the cliché "the more things change, the more they stay the same")' (Johnston 2007, 24). Rapid product development cycles—in this case, Spotify's endless production, promotion, and deprecation of 'new' modes of discovery, exchange, and consumption—and the production of 'socially-oriented' newness can also be understood as a technique of planned obsolescence. Here, obsolescence in reference to technological design can be defined as 'the mechanism of changing product style as a way to manipulate consumers into repetitive buying' (Slade 2009, 5). Spotify revamps itself continually to encourage continued subscription. The result of this is that the platform never fully feels 'discovered'. There must always be something 'new' in terms of music consumption or

⁶⁵ This feature was quietly removed in 2016, further evidence of how Spotify design is in flux.

discovery, something not fully figured out before it is changed, and the captivation/development cycle begins anew.

Individuation and enchantment are thus two of Spotify's chief tactics in its pursuit of profitability. The three primary metrics for predicting profitability in 'freemium' subscription services such as Spotify are customer acquisition costs (how much the company spends in marketing in order to attract each new user), conversion rate (how many free users eventually subscribe to the service), and churn rate (the frequency at which subscribers cancel the service) (Murray 2015). Spotify CEO Daniel Ek has repeatedly linked high levels of usage of Spotify to customer engagement, arguing that users who stream their music eventually become long-term subscribers: 'this shows that our conversion rate is working [. . .] we're proving the more people play, the more they'll pay' (Adegoke 2014). A quote from Spotify's Artist Relation webpage reinforces this finding:

'The real measure of Spotify's success is our progress in 1) convincing music fans around the World to pay for music again (by converting millions of pirates into monetized users on our platform), and 2) increasing the total money spent by paying listeners by graduating them to a much more valuable form of consumption (away from free listening on YouTube and other services to Spotify[. . .])'

Spotify 2015

Spotify's 'success' and 'valuable consumption' are here defined entirely in terms of financial benefits to the cultural industries, not the users who constitute its musical publics. Spotify's social features are designed to draw users away from unlicensed platforms like Jekyll, which are more likely to animate musically imagined communities. Individuated experiences are designed to keep users engaged and therefore, maintain active paying subscriptions. Spotify user practices, such as the exchange and curatorial

labour arrangements I analyse in the next chapter, must be considered in light of the fundamentally rentier arrangement between Spotify, the cultural industries, and streaming music consumers.

Conclusion

In this chapter, I have centered my analysis of Spotify sociality on its musical publics within an individuated platform. The chapter suggests that, on one hand, Spotify's individuation of music consumption does offer new and sometimes exciting modes of musical experience and discovery, triangulating personalized and contextual data with broader consumption trends. Similarly, chains of dyadic exchanges and influences do circulate shared musical affinities within the platform, and the musical publics generated by the public playlist system represent an important component of Spotify's user experience.

Nonetheless, we must consider the significant pitfalls of individuated media experiences. Natalie Fenton and Veronica Barassi argue that 'self-centered media production practices promoted by social media can represent a challenge to the construction and dissemination of political messages that are born out of the efforts and negotiations of a collective' (Fenton and Barassi 2014, 183), highlighting the precarious relationship between the individual and the collective in SNS. Fenton and Barassi attribute this, at least in part, to the design of social media's discursive logics, which encourage participation above all else. Their findings suggest that the carefully worded political protests of collectives are drowned out by the dissent of individualistic commenters. Applying this argument to Spotify, I suggest that genuine collectivity is

inherently prevented by individuated design. As the Jekyll genre communities show, communality is achieved only through collective practices, such as collaborating on curatorial projects.

Spotify's rapid development cycles and the ongoing state of sociotechnical flux shows how the socialities of streaming are fluid and often transient. Social components that once assembled together groups of users, such as the Soundrop chat rooms, are now deprecated, and such platform-dependent relations are easily severed. This lack of user control over the platform's social spaces points to the simulated nature of Spotify sociality. Furthermore, the experiences of MD, BL, and MS speak to the varying user experiences of captivation by newness. MD's satisfaction with Spotify is dependent on its ability to generate a continual stream of 'fresh' music selections; BL enjoys receiving consistently useful music recommendations from Discover Weekly, but dislikes how frequently the rest of the platform is updated; MS is strongly driven by technological enchantment, to the extent that his music consumption practices are self-consciously shaped by his desire to shape the output of Your Year in Music. These examples, which are broadly representative of many users' engagement with the platform, show how 'newness' is a key aspect of Spotify user experience.

Furthermore, this research shows the importance of polymedia integration for how users overcome Spotify's social limitations. Beyond Spotify's reliance on Facebook as a second-tier SNS, my tastemaker informant EW's use of Reddit to popularize his playlists exemplifies this finding. Spotify and Reddit are interconnected in EW's sociomusical practices, as his Reddit participation increases his follower count on

Spotify, which elevates his prestige. This speaks to a broader point about how technical design is experienced, resisted, and circumvented, examined in Chapter 9.

Spotify individuation ultimately depends on the curatorial labour of its users, connecting this analysis of individuation to the examination of circulatory labour in the chapter which follows. Spotify senior product designer for music discovery Matthew Ogle confirms this finding, stating, ‘our secret weapon is the fact that we have so many passionate music lovers on the service for so many years, [. . .] [which] means that the next generation of people trying out Spotify can benefit from all of that curation and usage’ (Titlow 2015). In the following chapter, I further examine the exchange and labour practices of Jekyll and Spotify participants.

Chapter Eight: Exchange, Labour, and the Formalisation of Informality

This chapter responds to two broad areas of theory often overlooked in existing studies of music circulation, which conceptualize the economic characteristics of file-sharing systems either as gift-like or as subsumed by market economics.⁶⁶ In addressing the two platforms I position the chapter in relation, first, to recent debates about free and precarious labour. Secondly, I link this analysis to anthropological theories of exchange and ownership. Previous research has rarely considered the sizable commitment of labour mobilised by file-sharing systems and has failed to engage seriously with economic anthropology when theorizing the exchange practices that generate music's online circulation.

The first contribution made by the chapter is to bring the literatures on labour and exchange, which have largely developed independently, into articulation. It does this by highlighting a number of ways in which the dynamics of labour and exchange characteristic of online practices are interrelated. Previous debates about the participatory dynamics of online communities have tended to present them either as manifesting the precarious labour conditions of late capitalism, or as offering vibrant examples of non-capitalist creative production and exchange which are antithetical to monetized economies. My analysis attempts to transcend the sterile dualism played out in the two positions.

⁶⁶ On file-sharing as a form of resistance, see Cammaerts 2011a, 2011b; Caraway 2011; Dawdy and Bonni 2012; Jones 2002; Sinnreich 2013. On participant perspectives and ethics, see Andersson 2012a; Burkart 2014b; Giesler and Pohlmann 2003; Kibby 2000; Lysloff 2003; O'Reilly and Doherty 2006.

The tenor of these debates is a legacy of two papers often considered foundational in theorising the nature of digital economies: Richard Barbrook's (1998) essay on 'high tech gift economies' and Tiziana Terranova's (2000) account of 'free labor'. Barbrook's depiction of the gift economy mechanisms of the internet in the 20th century, which he portrays as manifestations of 'really existing anarcho-communism' (133), inspired a significant body of work in which online participatory movements are characterised as gift cultures, especially in their open-source software and file-sharing manifestations (e.g. Giesler 2006; Raymond 2001). The internet is portrayed in this work as a mixed economy in which fully industrial sectors operate alongside gift subcultures, where individuals freely engage in non-market exchange. Barbrook recognises that online gift economies are distinct from those described in economic anthropology since these 'gifts' do not carry the same sorts of obligations as in classic gift-based societies, nor are they embedded in ongoing social relations. At the same time, he portrays the free labour expended in online gifting not as exploitative but participatory. In contrast, Terranova—in part responding critically to Barbrook—develops an autonomist Marxist-influenced analysis in which online free or unpaid labour is portrayed as 'a trait of the [digital] cultural economy at large' and as indicative of what she calls the 'social factory' (Terranova 2000: 33), wherein capitalist exploitation extends beyond the workplace into leisure spaces. Terranova contends, moreover, that since online communities' existence and activities are nested within wider capitalist formations, this necessarily implies that such online subcultural production should be theorised as a type of labour even when participants do not recognize it as such. Arguing against the 'glamorization of digital

labor’, she charts its ‘continuities with the modern sweatshop’ along with the ‘increasing degradation of knowledge work’ (ibid).

In the wake of these contributions, both of which fuelled continuing debates (see Ritzer and Jurgenson 2010; Scholz 2013; Skågeby 2010), subsequent studies of online communities typically frame the modes of participation at stake in terms either of exchange or of digital or ‘fan’ labour.⁶⁷ They rarely consider labour and exchange as interdependent components of online social formations, as I will propose.⁶⁸ The comparative ethnography presented in this chapter therefore overcomes the earlier dualism by arguing that the dynamics of circulatory participation in online music formations are only discernible by addressing both labour and exchange and their interrelations. Indeed, the ethnographic materials make clear that labour is required for the perpetuation of music’s online circulation, a process I describe as ‘circulatory maintenance’. For without ongoing commitments from users to sustain through their

⁶⁷ There is an underlying ethical imperative evident in the literature on free and precarious labour. David Hesmondhalgh (2010) provocatively examines one of the key underlying assumptions in the debate over free labour: what is ‘good work’, and how does it fit into concepts of a ‘good life’? Mark Andrejevic notes that ‘it is a sign of a certain kind of material luxury to be able to be exploited online—to have the leisure time and resources to engage in the activities that are monitored and tracked’ (Andrejevic 2013; 162). The forms of free labour exploitation considered in this chapter are unequivocally different from the modes of existence Neilson and Rossiter 2005 terms ‘precarity’. Nonetheless, this should not discourage research into the instrumentalisation of audience participation.

⁶⁸ See Baym and Burnett 2009 and Baym 2011. These two articles address the productive aspects of free fan labour as something other than exploitation. Perhaps most strikingly, the pleasures fans derive from their production are not written off as a form of ‘false consciousness’, as is implied in many critiques of participatory culture and free labour (see Jarrett 2008; Ross in Scholtz 2013, for example). While it is important that fan labour is differentiated from the forms of labour conducted by musicians, it is essential to note that the affective pleasures gained from these case studies of participatory culture highlights the mutual mediation of music and social relations. While the framing of these engagements as constituting ‘gift cultures’ does not align with my analysis of musical exchange, this literature offers several important insights. Musicians and audiences can interact in mutually beneficial and meaningful ways (and music itself is essential in forming these relations), and free labour here is not inherently linked to precarity and inequality.

labour the musical, social, technical, financial, and regulatory components of both Spotify and Jekyll, the exchange relations of the networks simply cease to exist. I will show that circulatory labour is therefore required by and in service to the materialities and socialities of digital music exchange, while participants' willingness to contribute their labour derives in part from the socialities engendered by exchange. At the same time, it is the systematic shaping of consumption practices by the design and governance of the two platforms that in turn necessitates participation—and thus labour.

A final theoretical thread running through the chapter concerns the distinctive forms of exchange and sociality animated by Spotify and Jekyll. Here I bring new media debates into dialogue with anthropological theories of exchange, contributing to the momentum created by a series of key texts (Humphrey and Hugh-Jones 1992, Hann 1998, Humphrey and Verdery 2004, Strang and Busse 2011). I offer three contributions in this regard. First, I contribute to the ongoing clarification of major categories of exchange—sharing, reciprocity and redistribution (Sahlins 1972, Price 1975, Woodburn 1998)—by disentangling the kinds of reciprocity manifest in the two music platforms. Second, I pursue Strang and Busse's interest in the labour involved in construing both possession and the circulation of goods, as well as their insight into the fluidity of ownership and possession as 'social actions rather than... legal categories' and as entailing 'ongoing processes of symbolic communication and negotiation' (2011, 4).

Third, I continue to unpack the complex socialities engendered by music's online circulation and the particularities of each platform's modes of exchange, building upon my earlier examination of circulatory socialities in Chapters 3, 5, 6, and 7. If it has long been recognised that property relations are social relations (Hann 1998: 4) or amount to a

‘network of social relations’ (Hoebel 1966: 424), then it is surprising that analysis of the social relations immanent in particular modes of exchange has not been more to the fore. My route into this question is the innovative discussion by Caroline Humphrey and Stephen Hugh-Jones (1992) of barter in relation to other forms of exchange. The authors are intent on dispelling any idea that barter is a secondary type of exchange in comparison to gift and commodity systems, which are often depicted as a dominant binary pair (Gregory 1982). Instead, they emphasise how various forms of exchange invariably coexist: thus, ‘barter should be seen as one mode of exchange among others’, intermingling with ‘gift exchange, money transactions, formalised trading etc’, such that ‘strategies and obligations in one sphere will spill across into others’ (1992, 6). In a further move, Humphrey and Hugh-Jones dwell on the significance of the particular social relations created by barter, contrasting them with those engendered by gift and commodity exchange. If ‘in gift exchange, inalienable objects... pass between people already bound together by social ties,... in commodity exchange, alienable objects... pass between people acting as free agents’. Their main insight, however, stems from the contrast between gift exchange and barter. ‘Both the gift and barter are modes of non-monetary exchange which derive from, and create, relationships... What differentiates them is the compulsion and “contrived asymmetry” of the gift, as opposed to the relative freedom and balance of barter’ (ibid., 18). If ‘the compulsion of the gift... lies in forcing [the recipients] to enter into debt’, they argue, ‘the presence of desire [for the objects exchanged] in barter... suggests its own solution—the exchange—which nullifies demand’ (ibid). ‘

My conviction is that the socialities of particular modes of exchange are fundamentally central to both the experience of and the value derived from participation in circulation. As previously argued, perhaps the most striking feature of this ethnography here is how the two online music platforms embody distinctive types of sociality. These socialities amount to fundamental elements of the experience of the online music consumption systems, and they stem largely from the different ways that exchange is configured in the two platforms, not least by their materialities—which are immanently involved in the genesis of social relations. Particular forms of exchange and sociality are, then, configured by the design of the two platforms, as I have shown in Chapters 3, 5, 6 and 7. Moreover, labour is elicited by both platforms, and users' willingness to contribute their labour is largely derived from the socialities engendered by each system.

Designing Participation: Hybridity, Reciprocity and Ownership

A common feature of Spotify and Jekyll is how both platforms elicit a staggering diversity of participatory practices devoted to music's circulation and consumption, effecting a multiplication of modes of labour and exchange. In this section I analyse comparatively the nature of circulatory participation in both Jekyll and Spotify, unpacking in particular the distinctive kind of rationalisation of online music exchange entailed in each.

Jekyll: The Ratio System, Requests, and Reciprocities

In contrast to earlier public P2P file-sharing trackers, reciprocity in Jekyll is not voluntary but made compulsory through the platform's socio-technical design. Jekyll's

approach to the enforcement of reciprocity throws light on the particularities of private tracker economies, while revealing how the platform's architecture embodies a response to previous paradigms of online music circulation. As described in Chapter 3, the primary mechanism for enforcing reciprocity in Jekyll is the implementation of a 'ratio system', described in computer science literature as an 'asynchronous incentive paradigm' (Liu et al. 2010). The motive behind Jekyll's ratio system can be traced to attempts to discourage what are known as 'free-riding' behaviours, a pervasive problem in earlier informal P2P networks that drove the emergence and widespread adoption of the BitTorrent protocol. Early P2P networks, such as Gnutella and Napster, are widely acknowledged to have suffered network inefficiencies due to downloaders disabling their own upload capabilities, in effect obtaining music from the network without contributing or distributing it to others (Saroju et al. 2002). BitTorrent was designed to avoid this problem: it incentivizes synchronous reciprocity, since a user's download speed is suppressed if her or his upload bandwidth is limited or disabled, in this way technically combating the free rider problem. Free-riding behavior, however, also includes failing to contribute an equal amount of music to the amount downloaded, which the original BitTorrent protocol did not address. Ratio systems such as Jekyll innovate by extending the logic of technically-prescribed reciprocity so as to enforce a minimum statistical ratio of uploading (i.e., 'seeding') to downloading (i.e., 'leeching' and 'snatching') on all torrents. It does this by monitoring and metricizing each byte of uploaded and downloaded content for all users. To illustrate: a user who snatches 10 gigabytes of data but only seeds 1 gigabyte

back would have a ratio of 0.1.⁶⁹ In Jekyll, the prescribed minimum ratio is progressive, growing more onerous as the user downloads more music.

The anthropologist Marshall Sahlins' (1972) classification of schemes of reciprocity in gift-based societies is useful in unpacking the ratio system, and also confirms that Jekyll does not constitute a classic gift economy. Sahlins describes three basic forms of reciprocity: generalized, balanced, and negative. Generalized reciprocity refers to gifts granted without immediate expectation or compulsion to reciprocate; balanced reciprocity entails the immediate exchange of equivalent goods; and negative reciprocity refers to the direct exchange of goods such that the parties involved attempt to maximize profits while giving back as little as possible. Early P2P systems such as Napster embodied a socio-technical ethos akin to generalized reciprocity, in that participants were allowed to download music without any expectation of reciprocal uploading. Unlike gift-based societies, however, where socially inscribed norms oblige recipients to reciprocate in future, earlier P2P file-sharing systems suffered from the 'free-riding' behaviour described earlier, which is broadly akin to negative reciprocity. In contrast, the original BitTorrent architecture established a different exchange paradigm, including an incentivising scheme that resembles balanced reciprocity. In this paradigm, in order to obtain music from the network, music has to be redistributed back, with the formal obligation to 'seed' ending at the conclusion of the transaction.

Jekyll's ratio system represents a third stage in the evolution of types of reciprocity in online music exchange, introducing novel temporal elements. On the one hand, users' exchange statistics are monitored across the entire lifetime of their account,

⁶⁹ For an early example of the analysis of technically prescribed exchange ratios in file-sharing, see Slater 1998: 2.

with ratio statistics being measured in terms of aggregate snatching and seeding, creating ongoing obligations to engage in reciprocal practices. On the other hand, calculations are updated roughly every 30 minutes, and the member's current ratio is displayed on the Jekyll website's header. However, each download does not need to be matched by an equivalent upload as long as other torrents are seeded proportionally by each individual user in order to maintain the minimum required ratio, thus creating a system in which certain musical objects may be circulated many times over, while others remain mostly inactive. Users who do not seed enough to meet the required ratio are placed on 'ratio watch': a two-week period in which they are warned that they must balance their ratio to maintain their download privileges. If the required ratio is not met during this period, the member's download capacity is revoked. David Graeber suggests that the analysis of exchange relations such as these should be nuanced in terms of relative degrees of openness or closure: the extent to which the exchange either engenders ongoing social relations, including those of obligation or indebtedness, or does not produce ongoing relations (Graeber 2001: 220). If the tit-for-tat design of the original BitTorrent protocol terminates obligations at the completion of the initial exchange—a quintessentially 'closed' system—Jekyll's ratio system innovates by 'opening up' and prolonging the nature of obligations over time, while at the same time rationalising, speeding up and intensifying the reckoning of users' ratio metric as a kind of continuous disciplinary monitoring. If in gift-based societies the gift and its return must be separated by an interval of time, with the socialities created by such reciprocity being 'intrinsically linked to a mode of temporality that is heterogeneous, contextual and immune to any uniform standard of measurement' (Lee and LiPuma 2002: 202), then Jekyll's ratio system

combines an incessant, standardised temporality of reckoning with the extended temporal arc of the global ‘lifetime’ of the account, the latter effectively rendering Jekyll as a form of imagined social totality.

The ratio system is therefore one of the chief mechanisms by which Jekyll governs reciprocity in music exchange, and thus circulation. But it is also a crucial indicator of the hybrid nature of exchange in such file-sharing platforms. On the one hand, the standardisation and rationalisation of circulatory practices wrought by the ratio scheme speaks to a pseudo-commodification of the torrent economy, casting digital music files as interchangeable and alienable commodities whose ‘cost’ is directly correlated with the size of the digital file—in effect treating bandwidth statistics as a form of currency.⁷⁰ On the other hand, the ratio system’s approach to measuring overall uploads and downloads resembles a ‘pooling’ scheme, which Sahlins argues constitutes ‘a system of reciprocities’ (Sahlins 1972; 188). Here, reciprocity is reckoned in terms not of dyadic exchanges but of users’ relations to the torrent community at large, in the guise of total amount of music received versus total amount given back. This aspect of the platform effectively constitutes Jekyll as a form of public, one produced through a rationalised hybrid of generalized and balanced reciprocity that is itself sanctioned as a public good. The obligations incurred by downloading a particular track, then, are not to the originator of the torrent, nor to each individual participating in the swarm, but to the system itself and by extension the entire Jekyll ‘community’.⁷¹

⁷⁰ And indeed, a significant portion of the literature addressing private trackers with ratio systems considers ratios to be a form of currency: see Cohen 2003; Cuevas et al. 2010; Hales et al. 2009; Kash et al. 2012.

⁷¹ Balázs Bodó notes in this regard that the social formations of private file-sharing services directly impact the dynamics of exchange, arguing that ‘the community, its rules, its governance

Further insight into Jekyll's exchange relations come from the Requests system, another elaborate exchange mechanism akin to a marketplace, but one that is designed to incentivise users to contribute new music to the archive. According to Jekyll guidelines, requests are explicitly designed as a reward structure to assist others in acquiring new music and as an incentive to expand the tracker's archive. Users who desire a particular unavailable musical object, and whose ratio is sufficiently positive, may add the track to the requests index. This index lists all music currently requested by Jekyll members along with the bonus it will award to the first user to upload the requested release. Those who wish to see a particular request fulfilled 'vote' by contributing a portion of their available total data uploaded statistic (referred to as 'buffer') to the request page, while the total amount of reward offered by all those supporting the request is referred to as the 'bounty'. For example, a user who has uploaded 100GB of music and downloaded 20GB would be said to have a ratio of 5.0, and a buffer of 80GB: if she were to create a request and put a 10GB bounty on it, her buffer would be reduced to 70GB. Each individual request page contains the track's desired source medium (such as vinyl or web), required digital format (e.g., lossless FLAC, particular MP3 bitrates, etc.), and often further metadata and paratextual information. Once a member obtains the requested music release and uploads the files to Jekyll, the request is marked as 'filled' and the bounty is immediately transferred to the successful uploader's account, often drastically improving their ratio and allowing them to download more music.

mechanisms, its opinion leaders, its discussions, its collective identity is what can ensure the long-term survival of not only the commons in question, but also the practices that sustain these commons' (Bodó 2014; 256).

In one light the requests system appears surprisingly akin to an autonomous market economy in which ratio, buffer and bounty are components of currency, and where forces of supply and demand dictate the pricing and purchasing strategies of those making the request as well as those filling it. Yet closer examination of actual exchanges in the request forum reveals a spectrum of dispositions towards exchange, none of which are completely subsumed by orthodox market logics. Perhaps the clearest criterion for classifying requests is the desired track's wider availability in licensed distribution networks: it rests on a distinction between easily procurable and less easily obtained, or obscure, requests. Regarding the former, requests often occur for music on sale from licensed sources such as iTunes, Bandcamp and the secondhand vinyl marketplace Discogs.⁷² Informal norms in Jekyll dictate that requests involving a purchase should carry an appropriate bounty: for a \$10 release, a bounty of at least 10GB is usually obligatory for it to be filled. Consequently, members often discuss socially appropriate 'exchange rates' before posting requests, a clear indicator of mimetic market discourse in which the ratio system and individual buffers are imagined as units of currency.

However, when considering less easily obtainable music, such as out-of-print recordings and unreleased tracks, the notion of appropriate exchange rates is not invoked. Instead, the request bounty becomes less an instrument for incentivizing those who may fill the request and more akin to a symbolic indicator of the communal value placed on the request by all those interested in having access to this music. In particular, PU+ members will often contribute their 'spare' buffer to the bounty offered for obscure

⁷² While file-sharers might be expected only to use extralegal sources of music, the majority of music available on Jekyll is uploaded by users who have purchased the release, either as a digital download or as a physical copy.

recordings, even when they have no personal interest in them, in the higher service of expanding Jekyll's archive. For obscure but highly valued musics, then, Jekyll's moral economy comes to the fore: requests for rare recordings can be filled for minimal reward, and no direct correlation exists between the size of bounty and the rate at which such requests are filled.

The disparity between easily accessible and obscure requests points to the symbolic capital accruing to obscure recordings and those uploading them, as well as to the socialities engendered by the request system. If some requests resemble commodity exchange—in that payment is made, and obligation discharged, by the market-like transfer of the bounty—requests for obscure musics generate above all ongoing socialities. In practice, then, the reward for filling a request is not reducible to individual ratio gains, for when filling long-standing and difficult to locate requests, it is prestige that is at stake. In these cases, requesters often make new social connections with and express gratitude to request fillers, exploring common musical interests and strategies for sourcing additional releases. Moreover, the sociality engendered by such requests spreads beyond requester and filler to include others interested in the desired release. Indeed, in some cases the filler of a highly-anticipated release may receive hundreds of messages of gratitude—and corresponding amounts of symbolic capital. An informant active in the request system, KF, opined that he rarely considered the bounty sufficient incentive to engage in filling requests; rather, the social and normative dimensions of Jekyll manifest in expressions of goodwill, enhanced reputation and admiration for filling valued requests were the primary motives for uploading.

What is remarkable, then, is how Jekyll simultaneously mimics the logics of both market and non-market exchange, drawing together complex forms of reciprocity with currency-like mechanisms, as well as market-like equivalences with an economy of symbolic capital. Against Barbrook's depiction of the internet as a vast 'mixed economy' composed of bounded sectors—public, gift-like and commercial—I suggest that Jekyll is neither a gift nor a market economy, but a hybrid (see Scaraboto 2015). There are no components of the Jekyll system that are either wholly commodified or entirely gift-like: the requests system is simultaneously a marketplace—complete with internal currency and mechanisms for negotiation—and an aspirational 'wishlist' where members collaboratively seek out rare tracks, not for individual gain but to enhance Jekyll's musical commons. Similarly, the forms of reciprocity mandated by the ratio system combine aspects of generalised and balanced reciprocity. The ratio system, finally, represents both the pseudo-marketization of the torrent economy and a rationalisation of reciprocities, one that inventively shifts the nature of exchange obligations from the dyadic to the communal. It is this entanglement of seemingly contradictory ideologies and practices that constitutes the irreducible hybridity of Jekyll's exchange system.

Spotify: Curation as Simulated 'Exchange', Ownership and Possession

In this section, I address through Spotify the alternative hybridization of exchange and labour that has arisen with the growth of licensed streaming services. As previously argued, Spotify's mode of address to consumers is highly individuated via a streaming interface that imitates the personal music library format. In marked contrast to Jekyll, exchange relations and modes of reciprocity are not central to Spotify's socio-technical

design, which effects a shift from the communal to the individuated and dyadic. Indeed, in comparison with Jekyll and previous P2P platforms, exchange, reciprocity and the socialities they engender are severely reduced and curtailed. But in order to socialise and enrich the nature of its interface, so making it appear closer to the prevalent nature of online musical experience, Spotify appropriates—by simulating—features of informal P2P music circulation. Its hybridization therefore takes the form of the simulation of aspects of informal P2P exchange within a formal, commercial music consumption system. In Spotify's exchange and labour practices, it is the instrumentalisation and individuation of consumption that is to the fore (cf. Virno 2004: 76-80).

The clearest appearance of exchange relations in Spotify occurs through its elicitation of the practice of public playlist curation among its users. This represents an appropriation-simulation of the curatorial practices of unlicensed P2P music communities, while in parallel Spotify restricts the flows of musical objects that would otherwise engender exchange relations. Thus, while the architecture of Spotify allows music's paratexts and user-generated playlists to circulate freely on the platform, generating a certain delimited field of circulation and exchange, access to discrete music files—that is, to the 'music itself'—is centrally controlled and restricted. Users cannot exchange files between them, dyadically or more widely, nor can they contribute or add uncatalogued releases to Spotify-sanctioned playlists. The inability to expand Spotify's catalogue through user contribution, a feature called 'cloud files' by competing music streaming service Google Play Music, was a frequent point of conversation brought up by Spotify users and informants. This radical enclosure of the circuits of digital music flows is necessitated by Spotify's rentier model, which depends on the privatisation of musical

sound and monitors and monetises each ‘listen’. Spotify thus oversees a drastic reduction of exchange relations in music’s online circulation accompanied by the simulation of such exchange relations via playlist curation.

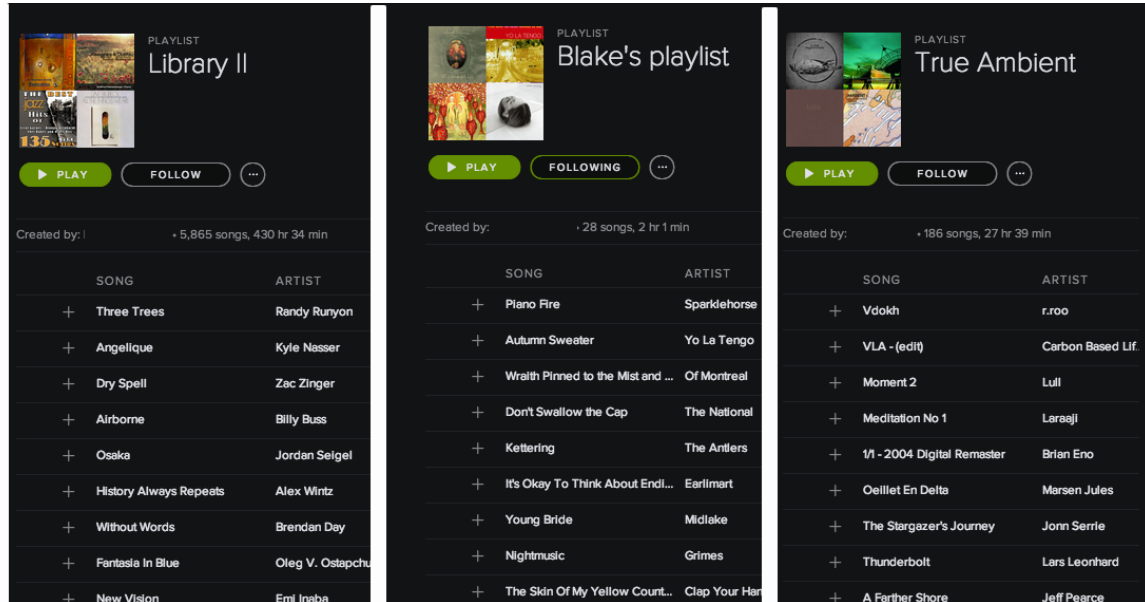


Figure 18. Three examples of individually-curated public Spotify playlists.

As introduced in Chapter 7, the creation of playlists is the most common way to organise musical ‘content’ in Spotify, both for private consumption and as publicly-searchable collections curated by users and staff. Playlist curation is a key means for users to manage the music that they stream, but when made public or ‘shared’, such playlists also embody Spotify’s core strategy for devolving the organisation of its over 30 million track catalogue (see Drew 2005). Playlist curation is, then, central to the mutual value creation that is the putative objective of Spotify crowdsourcing strategies—a conduit for transforming cognitive and affective value into exchange value. Clearly, it amounts to a type of free labour, exemplifying Terranova’s analysis of labour practices that ‘have developed in relation to the expansion of the cultural industries and [that] are

part of a process of economic experimentation with the creation of monetary value out of knowledge/culture/affect' (Terranova 2000; 38).

While playlist creation practices vary widely, the case of one advanced Spotify user illustrates the demanding labour involved in assembling a personal collection. MF, an avid digital music collector and amateur musician, possesses an MP3 library of several terabytes, some 175,000 'songs', in addition to his Spotify account that numbers over thirty thousand tracks. MF explained that Spotify now accounts for almost all his personal listening, but demanded a substantial investment of time and creativity when he first joined five years prior. Deciding to use Spotify in place of his MP3 collection required him to completely reconstruct his 'essential' personal music library, which was accompanied by the constant addition of newly discovered music. He continues to add full albums to a series of nested 'library playlists', which are intended not for listening but as a means of adding the files into his personal Spotify collection from which new playlists could easily be constructed. This can be understood as a reconstruction of the hierarchical desktop directory system embodied by Microsoft Windows folders: as MF's older music library was assembled and sorted within hierarchical folders (following the format 'My Music Folder' – [genre] – [artist name] – [release name]), he adapted the Spotify playlist folder system to afford a similar logic of musical organization.

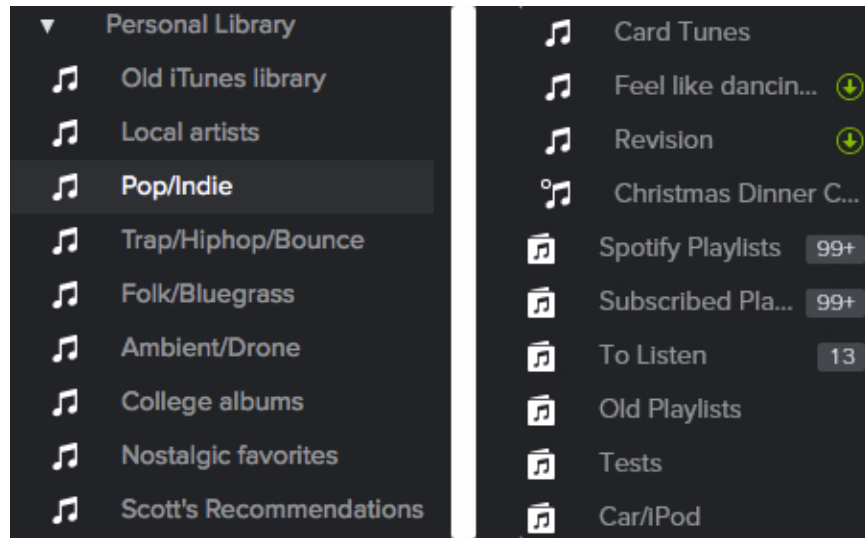


Figure 19. Two characteristic examples of the use of playlists and playlist folders as an informal library. The left example includes playlists curated by genre, affect, personal recommendations, and time periods in the user's life. The right example, a portion of key informant PD's library, is primarily curated by functionalist criteria.

At the same time, the curatorial labour of playlist creation is a key source of the socialities enlivened by Spotify participation. MF is again illustrative: his playlists vary in theme and are organized around conceptual, aesthetic, generic or functional as well as personal criteria. Many are named after friends and curated as a musical rendering of a friend's personality and tastes. These personalized playlists are occasionally shared with friends by email, but more commonly shared by face-to-face, co-present listening to a playlist together. Indeed, MF's organization of his Spotify account is pointedly designed with other listeners in mind; he spoke fervently of the importance of 'listening with friends', and of the musical-and-social relations produced through browsing friends' collections (e.g., discussing shared musical interests, learning about new artists, making new connections). For MF, the significant investment of time and labour in assembling a coherent collection in Spotify is not considered work: it affords a mode of music consumption unlike previous platforms, and the expenditure of time and effort is

experienced as a rewarding act of creative self-expression. Similarly, the exchange relations of ‘sharing’ were not emically interrogated: playlists were not understood as either gifts or commodities, but as sociomusical objects affording a range of musical practices.

More generally, Spotify use depends on customers like MF contributing their curatorial labour to programme listening sessions, putting users’ creative participation to work while simultaneously adding value. In turn, not all Spotify users curate personal playlists or assemble personal collections, relying instead on the playlists of others. Another informant, MM, uses Spotify solely at work to listen to a playlist of ambient music imported from iTunes. At home, in contrast, she selects music, depending on the event or mood, from her mixed physical-and-digital collection consisting of CDs, MP3s, vinyl records and cassette tapes. For MM, the time required to recreate her personal collection within Spotify—by manually searching and saving each album to her account—is not worth the effort, so she engages in a very limited capacity with the platform.

Both cases tellingly point to questions of ownership, illuminating how playlists and tracks saved to personal Spotify accounts intermingle with other media and modes of music consumption. Strikingly, both MF and MM do not use Spotify to discover new music, but for listening to music they already know and that they mainly own in alternative formats. They diverge, however, in their approach to their cross-platform consumption practices. For MM, Spotify is effectively a ‘workplace iTunes’, an extension of her previously-established consumption practices into new environments; while MF’s Spotify collection has been tightly calibrated to duplicate his earlier

collections and, despite its streamed ‘immateriality’, is marked by personal, social and affective resonances that resemble the residual traces of meaning attributed to physical collections (Benjamin 1968). What is clear is how earlier paradigms of music ownership, including collections of physical recordings and digital libraries of MP3s, appear to mediate users’ understandings of their Spotify music collections. Informants consistently compared their Spotify experience with other forms of music consumption, often noting their stronger affective attachments to musical objects believed to be fully owned (see Keightley 1996; Straw 1997).

The extent to which users understand their Spotify accounts as a personally-owned collection is illuminated by the much-reported distressing experience of ‘loss’ when their collection is modified beyond their control by Spotify governance. NT, a vinyl music collector who briefly tried Spotify, chose to discontinue his use of the service upon recognizing that songs are often unexpectedly removed from the platform. Such removal occurs because of the multiple multinational legal environments in which Spotify operates, resulting in convoluted licensing schemes, as well as challenges to Spotify’s regime by rights holders.⁷³ As a result, popular releases are commonly unavailable in particular regions, with no easily-accessible method for users to monitor their availability; and indeed the Spotify catalogue exists in a state of constant flux, with music frequently being re-released, removed or otherwise disappearing from users’ libraries. Given the intimate affective connections that consumers have with their music collections, in both physical and digital formats (Burkart 2008; Hennion 2001; Kibby

⁷³ A now infamous example is when the British recording artist Thom Yorke removed the discography of his solo career as well as the band Atoms for Peace from Spotify in July 2013, arguing that the Spotify business model favours major record labels and is detrimental to unestablished and independent artists (Arthur 2013).

2009; Marshall 2014; Shuker 2004; Sterne 2009), it is unsurprising that informants are often upset when speaking about the involuntary loss of music that has been removed from the platform. The ability of Spotify and its partner rights holders to withdraw music from circulation is indicative of the imperious, sometimes coercive governmentality of streaming services when compared to previous forms of music distribution and ownership, which lack such mechanisms for revoking ownership or ‘repossessing’ transacted musical objects once they are owned. It points to the radical shift in the nature of ownership inaugurated by rentier musical capitalism through services like Spotify: in Spotify, the alienable nature of music as a commodity is greatly intensified.

The unsteady nature of musical ownership on Spotify has theoretical implications: for whether collectively or individually held, musical and other objects in online circulation are conventionally understood to be *possessable*—if not necessarily in the terms of classical liberal conceptions of property. Indeed, the three informants portrayed previously exemplify a spectrum of positions on the nature of ownership and possession in relation to Spotify personal collections. In the case of MF, his curation of hundreds of playlists serves as an investment of affectively-imbued labour in the platform, and the resulting library is experienced as a highly personal, individualized collection. Here, music streamed by Spotify comes to be fully ‘possessed’ through the work of curation. In turn, NT understands Spotify and other streaming services as transient because immaterial, inherently at odds with his ethos of collection. For NT, genuine possession depends on the musical object’s material permanence: physical record collections—under the collector’s control, resistant to being ‘repossessed’, and offering the pleasure of tactile stimulation and the companionship of enduring co-presence—offer musical-and-affective

experiences vastly superior to those of Spotify. Whereas for MM, her Spotify library is understood as a cross-platform secondary embodiment of an existing music collection, affording access to a personal archive in alternative spaces and times. For her, the songs saved to a Spotify account do not constitute a form of ownership, but the songs themselves are thought to be owned, in as much as they are (fully) possessed in physical and digital formats elsewhere. In each case, then, her/his affective attachment to and sense of possession of a Spotify streamed collection is profoundly mediated by a relational experience of music's material forms (Keightley 1996; Kibby 2000; Straw 2009).

Circulatory Maintenance: A Comparative Analysis

One of the clearest ways in which the users of platforms like Spotify and Jekyll are configured as participants is through the time and labour they are enjoined to commit to the functioning of both platforms. Drawing on Nancy Baym's account of the relational labour of musicians and their audiences (Baym 2014), I conceptualize these diverse forms of upkeep and management as *circulatory maintenance*: necessary labour concerned with perpetuating the platforms' musical, technical and social functioning, without which the circulation of music would cease to occur. In Jekyll, while uploading music is the most obvious mode of participatory labour, the platform depends also on a host of other competencies and contributions from its users to maintain its various features. Similarly, Spotify expends effort not only on attracting new users and expanding the licensed catalogue, but encourages users themselves to engage in maintaining the platform and its socio-technical relations. In both platforms, then, participation responds not only to creative energies, but to the need for digital forms of upkeep: correcting

errors, preserving torrents, reporting bugs, preventing abuses and rule violations and so on. In what follows, I probe the distinctive types of free labour devoted to maintaining both platforms as socio-technical-musical assemblages.

Spotify, Crowdsourced Technical Support, and the Instrumentalisation of ‘Community’

In Spotify, it is the enlisting of user labour to fulfil customer service needs and requests that most clearly illustrates the demands of circulatory maintenance and the hybridity of labour practices: that is, the formalisation of informal work. In this light, the initial point of contact for users in need of technical help or other customer services is the ‘Spotify Community’ discussion forum. In marketing in general, and particularly in the service industries, the concept of ‘customer relationship marketing’ (CRM) has been coined to indicate an increasing focus not on attracting new customers or selling products, but on the perpetuation of existing client relationships.⁷⁴ Spotify’s ‘freemium’ model amplifies the corporate need to cement long-term client relationships, since retaining users and converting them from advertisement-supported to paid subscription packages are key measures of Spotify’s economic strength (Page 2013). In this light, it is particularly surprising that Spotify users are enrolled to answer the questions and concerns of other users: a crowdsourced approach to circulatory maintenance in which participants are expected, in effect, to repair others’ relations to the Spotify brand by resolving any technical and operational problems that arise. Drawing on the lineage of

⁷⁴ According to Buttle, ‘relationship marketing’ implies an approach that is ‘progressively more concerned with the development and maintenance of mutually satisfying long-term relationships with customers’ (1996: 1).

internet message boards and forums, as well as expectations of communality and peer-to-peer support (Ridings and Gefen 2000), Spotify instrumentalises the ‘community’ forum model through its implementation of the CRM platform Lithium, vesting a great deal of first-line technical support not in paid employees but in unpaid Spotify users. Close attention to this fieldwork material demonstrates the circulatory maintenance unique to subscription-dependent streaming platforms. If ‘seeding’ is the primary mode of circulatory maintenance on Jekyll, Spotify’s most crucial maintenance need is user retention, an always-ongoing process of incentivizing its most loyal users to pacify other subscribers.

Customer service for Spotify is available through three platforms: On Twitter, by tweeting at @SpotifyCares⁷⁵; by an email-based ‘contact form’, and by an online forum, called the Spotify Community. The Community is based on the Lithium platform, a product referred to as ‘social customer experience management software’ by software development company Lithium Technologies. The Spotify Community serves as a form of frontline customer service, technical support, quality assurance feedback, and market research. The forums are directed by Community Managers – employees who control its social and technical environment. While Spotify employees do oversee the forums and are available to answer certain sensitive requests, the Super Users— a staff-selected user class denoting the most active and involved members—are expected to handle the majority of technical support needs.

⁷⁵ Much like the implied social dynamics inherent in calling the Spotify forums a ‘Community’, Spotify’s customer service Twitter account name itself serves as an apt indication of the affective labour required of customer service representatives.

The dozen subforums that make up the Spotify Community Forums cover multiple domains of circulatory maintenance, including spaces for open feedback, feature requests, musical discussion, playlist sharing, and official Spotify announcements.⁷⁶ However, ‘Help’ forums are the most relevant to this discussion, and also cover the majority of all forum posts. These forums are split by platforms, as the Spotify client and its features differ significantly based on the platform or device. The help forum, along with the documentation and Frequent Asked Questions pages on Spotify’s support website, is the primary source of Spotify technical support. Requests for tech support sent via the email contact form are almost always directed to the forums by an automatically generated email response.

The Spotify Rock Star program is a formalized user class system to incentivize and reward the most active and helpful forum members. Introduced in 2013 as a rebranding and refinement of the Lithium Super User system—notably drawing on the vernacular of commercial musicianship to denote hierarchies of membership—Rock Stars are an invite-only user class that offers moderator-level forum privileges, access to private forums, and the potential to earn forum-specific and material rewards, ranging from Spotify Premium e-gift cards to Spotify memorabilia, such as Spotify-branded hoodies or sunglasses. 1-month Premium prepaid subscription codes are the most frequently distributed award to Super Users, given out weekly to individual members awarded with the ‘Post of the Week’ and also periodically distributed to frequent contributors. These rewards are one of the primary drivers of Rock Star activity. Despite

⁷⁶ The existence of ‘off-topic’ and music discussion forums further support my contention that the Spotify Community genealogically simulates informal music socialities, as these functions do not directly facilitate any customer support functions.

not constituting formal employment, Rock Stars are to a certain extent managed and trained for the purpose of providing accurate and efficient support: guidelines regarding proper responses are distributed to new members to the program, and several tutorials exist to guide user participation.

The Gamification of Circulatory Maintenance

Lithium Technologies hosts several blogs to offer advice to their clients such as Spotify on how to manage support forums, often drawing on business management literature to analyse data harvested from activity on their platform. A brief consideration of this literature connects crowdsourced customer service and circulatory maintenance to the broader arguments of this thesis regarding the systemic shaping of user participation.

The structure of the Rock Stars program is marked by the influence of one of these blogs, titled the ‘Science of Social’, written by Lithium Chief Scientist Dr. Michael Wu. Wu’s analysis of Super User incentivisation revolves heavily around the notion of ‘gamification’, defined by Kai Huotari and Juho Hamari in the context of service marketing as ‘a process of enhancing a service with affordances for gameful experiences in order to support users’ overall value creation’ (Huotari and Hamari 2012; 20). ‘Gameful’, in this usage, suggests that the service is not simply reminiscent of a game, but actually offers an experience comparable to that of conventional gaming activities. In a multi-part series on super users and their incentivisation, Wu writes on the mentality behind user participation in corporate cultures and forms of productivity that are also experienced as rewarding or pleasurable. Drawing on the notion of ‘flow’ in behavioral psychology (Csikszentmihalyi 1996; 2003), Wu notes the particular forms of

concentration that occur with tasks that are neither challenging or boring: individuals get in ‘flow’ when tasks meet but do not exceed their abilities. Forum contribution, he explains, can be incentivized and shaped to induce flow. Natasha Schüll, writing on slot machine design and addiction, notes that Csikszentmihalyi distinguishes between ‘escape forward’ and ‘escape backwards’ flow, with motivated individuals seeking self-actualization through the activity comprising the former, and those seeking escapes representing the latter (Schüll 2012). Difficulty must also gradually respond to changes in the individual’s capabilities: while positive feedback must be achieved frequently in the learning stages of work, individuals quickly become disengaged if future rewards are as easily obtained. Similarly, video game design often relies on intermittent reinforcement reward structures to encourage long-term play, which have been linked to addiction-prone behaviors (Nardi 2010). Video game consumers, Wu notes, often achieve a state of flow, and attributes the propensity of gamers towards addiction to be related to the pleasures that video game flow arouses. Lithium Technologies draws on their legacy in the gaming industry in the design of their platform in order to attract and retain super users.

Following from these insights, the Rock Star Program is designed with multiple levels of ‘achievements’, offering super users new goals and markers of prestige at each level of involvement. The units of measuring Rock Star performance involve three primary types of social activity: Post Count, Kudos, and Solutions, each of which simulates the more naturally-occurring social dynamics of non-commercial online forums. Kudos is akin to the ‘Like’ button in social media platforms, as it used to signal agreement with a high-quality post. Solutions are the most important forum action to give

or receive: the creator (or any Super User or moderator) of a topic can mark it as ‘Solved’, which links the original post to the post containing a satisfactory answer to the question. Inasmuch as ‘flow’ can be said to be achievable within online forum usage, it occurs when users are able to answer questions briskly and accurately: Rock Stars typically post multiple times within a short timeframe, minimizing the amount of idle time spent browsing the forums. Kudos and Solutions are not necessarily awarded for each post, representing a form of intermittent reinforcement: frequent and high-quality posting is incentivized by the inability to know ahead of time which posts will be given Kudos or marked as a Solution. Ultimately, while Spotify’s gamification of customer support attempts in certain ways to implement fun and rewarding measures for its most valuable contributors, it is in the service of ensuring the continued productivity of participants.⁷⁷

While proponents of gamification suggest that it may be used to improve the experience and conditions of workers, its implementation in the Spotify customer service realm is characteristic of the instrumentalisation of fan labour. Nonetheless, each Super User I spoke to was happy to contribute their time and effort to Spotify, and for various reasons: one individual told me that he disliked being idle, and he answered questions in his downtime from schoolwork, comparing it to watching a television program and relaxing after a day of work. Another was a software developer, who began posting

⁷⁷ While the Spotify Community forums are perhaps the most pervasively-gamified aspect of the service, both Jekyll and Spotify carry particular traits of gamefulness: the user class system of Jekyll rewards users for contribution. Similarly, the social nature of the Spotify platform contains aspects of gamification: the ‘follower’ count is prominently displayed on both user profiles and public playlists, and users compete for the prestige of having highly-followed playlists, often posting requests for follows on other social media sites. Each instance follows a similar logic of gamification, where user contribution is rewarded systematically as well as socially.

inquiries in the forums while developing utilities based on the Spotify API as a hobby⁷⁸, and enjoyed participating in the Community to the extent that he continued to do so long after his questions were answered. The appropriation and instrumentalisation of leisure time is not always experienced as exploitation, and regarding my informants' involvement with Spotify as a form of false consciousness negates the experience of individuals, as well as my own participant-observation. Some users find personal satisfaction in helping others solve problems or in improving the Spotify platform by managing customer feedback: if it is not strictly speaking fully altruistic, it is also certainly not opportunistic. In conclusion, unlike in Jekyll, where exchange and labour practices themselves engender ongoing musico-social relations, in Spotify the propensity for online discussion forums to stimulate participatory socialities is leveraged towards devolving circulatory maintenance to the platform's own customer base. By replacing paid support staff with flexible, mainly uncompensated users, Spotify informalizes the work of customer service through crowdsourcing. As a result, Spotify community forum practices take a hybrid form somewhere between informal employment and regulated participation.

Seeding and the Moral Economy of Jekyll

If customer servicing points to Spotify's appropriation of participatory labour, in Jekyll the most common type of circulatory maintenance is 'seeding': the onerous work of uploading content through a BitTorrent client. But the labour does not end with the initial upload; for due to the design of private trackers, once a release has been uploaded

⁷⁸ Strikingly, these user-contributed extensions to the Spotify ecology constitute another form of uncompensated labour.

to Jekyll at least one member of the swarm must actively maintain support for the torrent on their server to prevent it being purged from the index. Indeed, in its introduction to new users, Jekyll is described as a ‘community’ that promotes ‘sharing’ through seeding. Since the labour of seeding involves users’ own computers, making music available requires constant human attention. Many users explained that because of the demands placed by seeding on their hard drive or bandwidth, their involvement in Jekyll necessitates frequent interventions in the form of deleting unnecessary files, transferring content to external drives, or judging which torrents require long-term seeding—where ‘long-term’ can mean continuous uploading for three months or longer.⁷⁹ The motivation for long-term seeding, however, is not merely technical: it is also encouraged as a social good, mutually benefitting the seeder and Jekyll at large. The social good is perceived to stem from superior download speeds—a notable benefit of strong BitTorrent swarms—as well as from preventing the deletion of tracks, so maintaining a rich archive and supporting the continued availability of a range of musics. The participatory labour of long-term seeding therefore embodies Jekyll’s archivist moral sensibility. And indeed, Jekyll presents itself in the private tracker scene as a ‘well-seeded’ tracker, positioning itself against trackers that often suffer from having few participants willing to seed long-term.

⁷⁹ The temporal economy of seeding varies: an initial upload—how long it takes to distribute a single track to another peer—depends on the size of the release and participants’ available bandwidth, but ranges from several seconds to a few hours. The task of maintaining the availability of a track on a torrent is, however, far more time-consuming because at least one seeder has to be seeding a track throughout its life on the platform; the task can shift between participants, but some seeders have been seeding particular tracks for years. The situation also results in some seeders feeling obliged to maintain a track by seeding it even when they no longer themselves want it on their computer.

A corollary of these processes is that, as mentioned before, torrents that are not seeded by any swarm member for two weeks are automatically purged from Jekyll. A rough estimate places the number of torrents removed due to inactivity since 2008 at half a million. This loss of often obscure and otherwise difficult to obtain music from the platform deeply disturbed informant KF. In an interview he reflected ruefully:

‘The only torrents that are absolutely safe from being pruned for inactivity are the ones that are extremely popular and well-distributed in the [physical] world as well [. . .] [But in] terms of wildlife preservation, those are the albums that belong in the “least concern” category.’

For KF and other users, the inactivity purges on Jekyll induce a melancholic sense of cultural erosion; as a result he commented on the ‘data and culture transfer’ that Jekyll might ideally have enabled but which could no longer take place. KF responded to the tendency to evaluate torrents on the basis of their popularity by highlighting the archival importance of maintaining obscure works. Popular works, he opined, are easily obtainable through other means, such as public trackers, and as such should not be the primary concern of Jekyll. Jekyll is well suited to such archivist sensibilities, and, as we have seen, the requests service rewards the circulation and preservation of obscure releases. The necessity continually to seed, and preferably long-term, is therefore elevated by Jekyll to something resembling a moral principle: it is at once designed technically into the BitTorrent protocol, enforced by Jekyll’s ratio system, and expected of Jekyll participants as an inherent good—one that supports a rich musical ecology, including rare musics. Continual seeding, embodied in combined technical, musical and social labour, and the responsibilities to the common musical good it is envisaged as

serving, amounts to the crux of Jekyll's musical moral economy, highlighting the moral dimensions of digital music exchange (Cheal 1988; Giesler 2006; cf. Scott 1976).

In their distinctive design of circulatory maintenance, Spotify and Jekyll manifest their labour relations at their clearest: Spotify imitating and instrumentalising the participatory socialities of crowdsourcing on P2P networks in order to enhance commercial profitability; while in Jekyll, the participatory labour of long-term seeding is seen as a necessity to rectify the market failures of its quasi-formalized economy, while also being valorised as a core expression of commitment to the common social good.

Money and the Jekyll Social Economy

One of the principal ironies of the study of extralegal, apparently non-monetary exchange systems such as Jekyll is the fundamental necessity of monetary expenses dedicated to maintaining the technical infrastructure of the ecology. Aside from the financial investments users make in their consumption practices, including the acquisition of recorded music commodities and audio playback technologies, this section analyses the financial operations of Jekyll and the systems by which administrators elicit financial support from their user base, considered also as an essential form of circulatory maintenance. The monetary flows of Jekyll donations are some of the clearest expressions of the enduring connections of Jekyll sociality: they at once afford the continued operation of the tracker while also demonstrating the deep levels of commitment musically-mediated socialities engender. It also is an apposite subject for unpacking how capitalist exchange systems encompass and penetrate file-sharing spaces that espouse non-commodity exchange.

Jekyll is entirely supported by user and staff ‘donations’, as no advertisements are integrated into the site, nor are memberships purchasable, unlike some private trackers⁸⁰. The financial burden of running a tracker with over 150,000 active users is sizable. While exact figures are closely held secrets, based on the scale of Jekyll’s tracker and bandwidth usage, a conservative estimate of its server costs is still several thousand dollars a month.⁸¹ The financial situation of Jekyll – how much is taken in, and how much money per month is necessary to maintain service – is one of the most closely guarded secrets held by staff. Staff members have explained that the financial arrangements of the site are legally contentious, and while some site participants have called for greater transparency and accountability—mirroring vaguely neoliberal rhetoric regarding governments’ responsibilities to its constituents—administrators have consistently enforced a strict policy of disclosing as little information as possible about server costs, hosting locations, bank account locations, administrative control, and so forth. Informants occasionally referred to a scandal involving a former staff member who stole a significant sum of money intended for the purchase of new server equipment during one of Jekyll’s first years of existence; afterwards, Jekyll staff instituted a more rigorous security protocol for handling finances. As a general rule throughout the private tracker scene, financing a site of this magnitude is a precarious and difficult

⁸⁰ ‘Pay-to-leech’ and the sale of memberships are anathema on Jekyll and in most of the loosely affiliated sites in the private tracker scene: communal norms within the scene dictate that the financing of server costs must be met through donations or through the sale of ornamental and prestige objects. That is to say, Jekyll members consider sites that allow ratio system forgiveness through donations to be highly unethical.

⁸¹ Based on figures published by the defunct tracker StN in 2009, a private tracker servicing 6,000 active users (~4% of the user base of Jekyll) carried monthly costs of \$1,200 a month (Enigmax 2009). However, Jekyll’s development projects, GLIDER and ORION, lead to substantial gains in computational efficiency. Therefore, one can assume that the monthly costs of Jekyll are proportionally much lower than that of StN.

process: a significant percentage of all major private trackers no longer exist after running out of funds, and many still-existing notable trackers have had donation accounts on sites such as Paypal and GoFundMe frozen, on suspicion of facilitating illegal activity. In this context, it is not surprising that Jekyll's finances were difficult to account for.

During fieldwork, Jekyll unveiled a new financial support incentivisation scheme, called the 'Donor Tier System'.⁸² This donor system casts new light on the political economy of Jekyll, showing how Jekyll's lack of traditional sources of funding generates alternative modes of extracting financial support from its members. In order to reward and acknowledge the dedicated donors who supported the site, a new Donor system was unveiled, which explicitly mirrored the ratio-based User Class system described earlier. In short, each donation or merchandise purchase included a specific number of 'Donor Points', and as a user acquired more Donor Points, their placement in the Donor Tier system would rise with five achievable classes announced at launch. Each tier requires a certain number of Donor Points, which disappear over time to incentivize scheduled, ongoing donations. Staff insisted that this did not represent a 'pay-to-play' or 'pay-to-leech' ('P2L') system, which typically refers to an offering within a private tracker where memberships or exemptions from the ratio rules are available in reward for 'donations'.⁸³ The Donor Tier System is explicitly symbolic, rewarding donors with prestige digital objects to highlight their contributions to the community at large. Rewards include a

⁸² In these official announcements to the user base, administrators reiterated that they do not draw a salary or profit from the site's proceedings in any way, and revealed that funds had been precariously low in past years and were bolstered by the personal contributions of staff members.

⁸³ Receiving an account in return for a 'donation' is clearly a commodity transaction, and therefore the term 'donation' is analytically inappropriate for these forms of exchanges. Informants echoed this sentence, arguing that private trackers that employ this scheme are fundamentally compromised, and often expressed their decision to disassociate themselves from trackers that introduced these schemes.

small heart emoticon next to donor usernames on the forums and customized ‘user titles’ on user profile pages. I estimate that the top donor contributed over two thousand Euros, and that the amount donated by at least ten other contributors equaled roughly one thousand Euros each. The Donor System clearly functions as an incentivisation scheme, charting and comparing donations for the purpose of producing competitive benefaction. Further to this point, ongoing small contributions of £5 or more are prioritized over occasional large sums in the calculation of Donor Points, recreating an ersatz ‘subscription’ model of sorts. In the initial administrative announcement of the Donor System, its purpose as a mechanism for soliciting reliable, ongoing contributions is baldly stated: Jekyll administrators explained that previous ‘donation drives’, where messages were sent to the user base requesting support to keep the servers online, were successful in raising several months of operating expenses at once, but donations trailed off significantly between donation drives. By systematizing the donation markers of prestige, Jekyll administration aimed to establish a sustainable model for funding and maintaining the tracker, which, by their account in a later announcement, led to the some of the most financially stable months of the site.⁸⁴

Jekyll monetary contributions, while all classified as ‘donations’ include the ability to purchase Jekyll merchandise. Jekyll has partnered with an independent music merchandising company, here pseudonymised as ToneStore. ToneStore markets itself as a full-service supplier and distributor merchandise for independent labels and artists, including a digital downloads distribution platform, custom screen-printed apparel,

⁸⁴ A surprisingly high proportion of Jekyll’s user base has donated to the site since the formation of the Donor Class System: by my evaluation, approximately 20,000 individuals have contributed \$5 or more, which represents over 7% of registered users.

stickers, drinkware, posters, and other similarly customized products. ToneStore independently handles all logistical necessities, including product creation, order fulfillment, customer service management, and so forth, only leaving content submission up to artists, such as the apparel design to be printed. Jekyll's entrepreneurial approach to funding the tracker has included the sale of surprisingly popular Jekyll-themed t-shirts, hooded jackets, and stickers depicting the site's de facto mascot, a cartoon face made to resemble a vinyl record. The sale of digital downloads of the previously-mentioned HV compilation album was also added. Crucially, Jekyll-contributed music *can* be sold, but is not necessarily the *object* of the exchange: in a strange transformation of the logics of gift exchange, digital commodities are purchased despite being freely available elsewhere on the site, in order to encourage a new type of donation to the site.

Yet even the most seemingly conventional commodity exchanges are marked by the ethos of non-profit donation, and purchases were explained by informants primarily as a method to give back to the tracker while also getting a small reward in turn. Each item for sale on Jekyll's ToneStore is 'worth' a specific number of Donor Points, further linking the sale of Jekyll merchandise to the Donor system. This evidences how Jekyll systematically encourages small but ongoing contributions, creating an ersatz 'subscription' model for Jekyll's circulatory maintenance, an example of how the licensed and unlicensed spheres of music circulation are mutually mediating, a point I return to in the Conclusion of the thesis.

The Donor Tier System, then is representative of the broader contours of Jekyll sociality: it is characterized by systemic shaping of individual behavior and technically-prescribed governance while also generative of powerful social connections and affective

notions of belonging. The ‘heart’ emoticon, which appears next to donors’ usernames to indicate their support, has also come to signify gratitude—users often post heart emoticons on filled requests to express appreciation and on administrative announcements to indicate their support of staff decisions—or communal goodwill. This is to say, despite the rationalisation of financial maintenance Jekyll requests of its users, the Donor System is nonetheless a meaningful social assemblage, consisting of altruistic giving, self-interested consumption (i.e., ensuring that the Jekyll index remains online), and prestige economy competition.

Conclusion

The ethnography of Jekyll and Spotify illuminates the two platforms as contrasting hybrid assemblages. Both platforms, I have shown, involve marked transformations of the file-sharing and distributed computing lineages in which they participate. Jekyll marks a radical enclosure, rationalisation and pseudo-marketisation of the erstwhile open, public architectures and musical ‘commons’ of earlier P2P file-sharing and BitTorrent systems. Spotify, alternatively, nests its simulation of peer-to-peer file-sharing within an individuated, rentier platform. An unexpected fluidity between formal and informal online music economies characterizes both platforms. In the case of Jekyll, hybrid reciprocities, quasi-commodity exchange, and regulative class systems are themselves hybridized to generate the distinctive social formations of the private music tracker. Spotify, in contrast, combines the appropriation-simulation of informal user-generated practices with rigid individuating governance in the service of a rentier economy. In each case, my portrayal of the interrelations between the materialities and

socialities of exchange demonstrates their critical importance for analysing the ‘politics of platforms’ (Gillespie 2010). These are politics that move across scales: Spotify and Jekyll’s capacities to shape music consumption derives both from their invention of novel forms of rentier musical capitalism and musical moral economy, respectively.

Contributing to the anthropology of exchange, I propose that the participatory socialities created by both platforms amount to compelling and rewarding elements of users’ experience, and that these socialities should not be conceived merely as instrumental conduits for an overriding telos of musical possession. Rather, any explanation of the intensity of users’ engagements must look beyond ‘the music itself’ to the particular qualities of online experience proffered by these platforms. Prime among these qualities, I suggest, are the stimulus and solace created by the diverse socialities engendered by online engagement,⁸⁵ as well as—in Jekyll—the sense of higher social purpose animated by the pursuit of music as a common ideal and an ideal commons. This is the case even, or perhaps particularly, when participatory online music platforms like Jekyll make such onerous and exacting demands that they may provoke obsessive investment from participants. Moreover, I join recent anthropological work in stressing how, in both platforms, a variety of types of exchange coexist. For the participatory socialities configured by both platforms are plural: if Jekyll formally orchestrates unequal and competitive ‘class’ relations that may appear to vitiate the pleasures of virtual socialities, these unequal relations coexist with alternative socialities that counteract the ‘class’ system—through practices poised somewhere between generalized and balanced reciprocity that embody the more equal and cooperative socialities of the commons, and

⁸⁵ These online socialities are a manifestation of Born’s first plane musical socialities.

through the lively competition for prestige and other symbolic rewards. In the case of user class relations, we find Born's third and first planes (2010b), as the hierarchical dynamics (third plane) contrast with and are compensated by the cooperative socialities of the commons (first plane). In Jekyll, then, the 'contradictory cartographies of the social' (Latour 2005, 34) are experienced by participants as drawing them to online exchange. Despite the hierarchical core of Jekyll socio-technical design, the fascinations of internet-mediated and musically-mediated socialities survive.

In comparison, although Spotify uncontestedly offers its consumers musical pleasures and affords access to unprecedented catalogues of recorded music, its highly individualised, rentier-based design occludes the modes of P2P exchange and attendant socialities that have come to characterize online music consumption. Consequently, although Spotify purports to offer a fully 'social' listening environment, the platform lacks meaningful characteristics of circulatory sociality. Communal reciprocities and the distributed dynamics of the P2P 'commons' are effectively non-existent in its functioning. At base, this is attributable to the platform's rentier strategies stemming music ownership. Spotify users' inability to fully possess musical objects, and therefore to exchange them, results in weak social relations. In contrast to Jekyll, the socialities formed through music's curation and circulation (via playlists) on Spotify are mostly limited to dyadic acts of exchange, forcefully circumscribed by the platform's centralised design.

In analysing Spotify, I have further developed throughout this chapter the concept of rentier music capitalism. This contributes to the theorisation of capitalism as having multiple forms, acknowledging not only how it transforms music but how it is itself

mediated by music (Born 2013). In invoking rentier capitalism, I draw on general arguments that the previous 30 years have seen ‘increasing uncertainty and volatility in the macroeconomic environment... [which,] when combined with higher returns in the financial sectors, may encourage rentier-type financial investments at the expense of real investment projects’ (Demir 2007, 353). Earlier, I cited Pasquinelli’s analysis of the ‘cognitive rent’ extracted by Google through controls over ‘knowledge enclosures’, which he links to the pervasive global pressures to strengthen intellectual property regimes, in as much as copyright amounts to the extension of rent to culture with the intent ‘to expropriate the cultural commons and reintroduce artificial scarcity’ (Pasquinelli 2009, 8). I find these arguments persuasive, and I draw connections to Andrejevic’s account, mentioned before, of the intensification of value extraction through the automated mining of data on consumer behaviour. I contend that Spotify’s rentier model depends on the intensifying of these processes through the recursive analysis of listening practices and consumer demographics, fuelled by the instrumentalisation of consumption and of users’ online social networks—derived as they are from users’ free, affective labour practices. The next chapter brings the governmentality of circulation to the fore, looking at the technologies of circulation and how they engender unique modes of engagement, conformity and resistance.

Chapter Nine: Circulatory Governance and Technical Cultures

This chapter examines the techniques of governance that regulate and supervise practices of music circulation and consumption and the formation of technical cultures within Spotify and Jekyll. The novel, accelerated modes of music circulation and consumption engendered by both private BitTorrent trackers and streaming are subject to onerous if distinctive modes of governance, enacted and intensified by the technophilic values of both platforms.

On both Jekyll and Spotify, technologies are deployed to enact diffuse, non-state modes of governance. Andrew Barry argues that governance should be understood as fields of practices in which power relations are negotiated (Barry 2001, 4-10). This follows from Foucault, who writes: ‘to govern [. . .] is to control the possible field of action of others’ (Foucault 2002, 341).⁸⁶ I take this understanding of governance further to show, in detailed ways, how forms of governance are designed or built into the technological systems of Jekyll and Spotify in terms of the forms of conduct they project, afford or anticipate. In this way, I respond to the current literature on technological regulation through design (see Yeung 2017). Madeline Akrich’s (1992) seminal account of how technical design prescribes particular forms of usage, thus envisaging ‘projected users’, is of particular importance here. Following Akrich, the chapter details

⁸⁶ A profusion of widely influential literature has been informed by the late Foucauldian interest in biopolitics (see Barry 2001, Burchell et al 1991, Guilbault 2007, Rose 1999), which extends beyond the scope of this chapter.

ethnographically both the ‘projected users’ afforded by the technical design and the ‘actual users’ of both platforms, tracing how they encounter and embody these modes of governance, and also how they work around or resist them. I extend Akrich’s insights through a dialectical formulation of circumvention technologies, showing how technologies of governance and actual users’ responses to these restrictions evolve in counterpoint to one another. After Akrich, I pose the following questions in the chapter: to what extent do these technologies create envisaged users? How much do they project usage, and what are the actual user practices that emerge in relation to these technically-prescribed forms of governance?

Within Jekyll and Spotify, social, musical and aesthetic questions are thought to be most efficiently addressed through technological solutions. In my formulation of Jekyll and Spotify’s technical cultures,⁸⁷ I draw on Andrew Barry’s concept of a ‘technological society’,⁸⁸ in the sense that ‘specific technologies dominate our sense of the kinds of problems that government [. . .] must address, and the solutions that we adopt’ (Barry 2001, 2). A key trait of technological socialities are the normative requirements of technical literacy of their constituents, intensifying ‘the need to possess and develop one’s knowledge and skill’ with new technologies (ibid., 3). I consider how the social imaginaries of digital music circulation cohere around the understanding of

⁸⁷ This formulation of technical cultures is also informed by Kristen Haring’s work on identity formation and Ham radio operators. Haring writes, ‘Adopting a particular technical identity can produce social categorizations, just as ethnic, class, religious, and national identities produce social categorizations. The *technical culture* developed by radio hobbyists, for instance, united hams as a group at the same time that it distinguished them from non-hams. In this way, pursuing a technical hobby led to membership in a separate, technically defined community’ (Haring 2007, 8; emphasis added). The ‘tinkerer’ impulse depicted by Haring resonates strongly with the technical cultures of both Jekyll and ‘advanced’ Spotify users.

⁸⁸ Henceforth I adapt Barry’s terminology to ‘socialities’, in order to more closely align with my formulation of circulatory social relations.

technologies as the primary means by which issues and challenges can be solved, and how usage of these platforms, particularly in Jekyll, depends on the requirement to first develop requisite technical skills.⁸⁹ I demonstrate that these technological socialities evince a disproportionate interest in the tools of circulation compared to the musical objects in circulation, and that a key component of circulatory labour lies in the incitement to contribute to the existing infrastructure of circulation. Indeed, the technologies of circulation come to represent an indispensable facet of music's materiality on both Spotify and Jekyll. The chapter is also informed by Born's 1995 monograph on the institutional politics of IRCAM, particularly in regards to music's technical cultures. Born shows how technological change came to stand in for specifically musical innovation, so that the technological and scientific discourses and practices in IRCAM culture displaced musical discourse (Born 1995, 325). Additionally, Born's account of music's systematisation and the governmental approaches to inducing ideological consent (*ibid.*, 143-163) are refracted here, particularly in the section on standardisation.

In comparing the governance of both platforms, it is important to note the differing political economies of Spotify and Jekyll. The innovations of Spotify technical design take place within a corporate environment tasked with improving profitability and subscriber retention, which strongly differs from Jekyll's looser coalition of uncompensated administrative staff members. While I showed in Chapter 4 that the design of each of these platforms is entangled in the other's genealogy, their differing articulations of control show how both platforms have different projected users. While

⁸⁹ For a recent consideration of the rise in 'technological solutionism', see Morozov 2014.

Spotify increasingly envisages passive consumers of ‘lean-back’ music listening modalities, Jekyll governance shapes a wider range of conduct, most strongly demonstrated in the section on temperance.

The chapter offers an important methodological contribution to the study of technical cultures by weaving together the ethnography of technical design with the practices of actual users. This follows from Akrich, building upon her insights by providing rich empirical evidence of the complexity of actual user practices. Through this comparative analysis, we see how compliance with governance occurs along a spectrum. Certain governmental restrictions on Jekyll and Spotify inspire counter-practices and techniques of circumvention, particularly evident in the seedboxes and ad blocking sections that follow, while others are mostly complied with, most strongly articulated in the sections on Jekyll temperance and the governance of contribution.

I begin by first showing how Jekyll participants are expected to self-regulate their consumption relative to their standing in the user class system. Next, I examine how the qualities of musical sound are themselves energetically governed on Jekyll, examining the contentious debates around high fidelity audio formats within Jekyll, as well as the standardisation of music contribution that shapes how music is formatted for circulation on the tracker. I then show how aspects of Jekyll music circulation and consumption practices can be automated, as well as how governance is brought into the design of both platforms themselves through automated bots and algorithmic listening modalities. I conclude with an examination of a number of circumvention technologies on both platforms, showing how bottom-up approaches to defeating regulation and governance are characteristic of widespread user practices on both platforms.

Governmentality, Ratio and Temperance

In this section, I unpack the complex governmental techniques within Jekyll regarding ‘proper’ consumption. I characterise the normative restraints on downloading as a temperance movement, which is influenced by the hierarchies inscribed by the ratio and user class systems. This section also demonstrates how Jekyll’s techniques of governance extends beyond top-down regulation, informed by Foucault’s work on governmentality (Foucault 1982).

The ratio system, described in the previous chapter, is the primary technical mechanism by which Jekyll subjects are taught to self-regulate. A document purporting to teach those struggling with the ratio system, found within the user-contributed ‘Tutorials’ section of the forum, is indicative of the moralistically inflected self-regulation required to maintain proper social standing within the tracker.

Stop Downloading. Seriously. Cut it out. That’s how you got yourself into this mess in the first place. Unless you have a very impressive connection it probably isn't helping and if you do have a very good connection your ratio is probably fine. Just wait. Is there really no where [sic] else you can get that CD you want? Is it really worth your account here? Take a breather and worry about seeding what you've already got. Not downloading new torrents. Go slow on number of torrents you download at a time and always keep an eye on your ratio. Develop patience and always wait until you have built some "buffer" (an upload amount that you can give up against future downloads). Be especially [sic] mindful of crossing download barriers. The required ratio here changes as you download more. Don't cross a line until you are ready for the new requirements.
[. . .]

Challenge yourself to become a Power User within a specific period of time (depending on the upload speed of your Internet connection). This will keep you watching all the necessary things all the time.

Collaboratively authored document, first published 2008

Similar accounts of the onerous demands of the ratio system were commonplace among my informants, including several former members who abandoned their account

after being placed on ‘ratio watch’, the probation system defined in Chapter 3. My informant APD, a New Orleans-based electronica musician, described the overwhelming excitement he felt when he first joined Jekyll in late 2014. His roommate was a Jekyll member and occasionally allowed APD to browse the index and download releases, which appeared to APD as a nearly limitless library of music and potential samples for his creative practice. Once he joined, however, APD found the demands of the ratio system and the governmental limitations on new member’s consumption to be confusing, arduous, and not worthy of the necessary investment of time and labour. After only downloading a few dozens releases, he allowed his account to lapse into activity and was disabled after less than a year of membership. During fieldwork, I encountered dozens of perspectives mirroring APD’s experience, yet PU+ members were often dismissive of these complaints. In a response to a new user’s complaint about the ratio system, the VIP member XA (belonging to the most prestigious level of the user class system) commented ‘Torrent sites are all about sharing, not taking’. XA often attempts to teach ‘proper’ file-sharing behaviour to newcomers, asserting the importance of restraint in downloading.

The ethos of the ratio system can be compared to the Platonic conception of temperance. In *The Republic*, temperance is described in terms of moral and intellectual self-regulation. A temperate individual is one who knows his ‘place’ in relation to authority and class, and one who controls his ‘appetite’ through the application of reason (Young 1988, 541).⁹⁰ Temperance movements in history have regularly occurred in response to periods of ‘overconsumption’, or a perceived societal lack of rigour and self-

⁹⁰ On temperance and governmentality, see also Eves 2011.

control (Shely 2013, 2). Temperance within Jekyll stands in opposition to the supposed ‘dematerialization’ and abundance of freely available digital music online (see Magaudda 2011, Whelan 2010). In the face of a multitude of ‘public’ platforms for unlimited digital music consumption, Jekyll’s metered approach to downloading attempts to reinscribe the inherent ‘value’ of music within a model of consumption driven by the artificial production of scarcity. These imperatives of temperance are emically held to be necessary in instructing subjects about the necessity of reciprocity, as most new members have never participated in a file-sharing community that mandates individual contribution. As members build up ratio credit and ascend user classes, there is also an expectation on PU+ users with large buffers to avoid both ‘hoarding’ and ‘overconsuming’ – one must download neither too much nor too little. This is a key facet of the dynamics of Jekyll’s hierarchical sociality. The governmental instruction is not simply to ‘consume less’, or to treat each musical object as inherently valuable, it is to ensure that new users ‘know their place’ within the torrent economy so that they do not draw more from more from communal resources than is deemed acceptable. In contrast, senior members are expected to maintain a high level of consumption to avoid hoarding ratio credit. The gradual relaxation of temperance is evidenced by the changing societal standards within the user class system.

A focus on ‘conduct’ distinguishes ‘governmentality’ from the rest of Foucault’s work on governance and power. Bal Sokhi-Bulley writes that in ‘governmentalized space, tactics – and not laws – are what is important to observe the relations of power that produce governor/governed identities’ (Sokhi-Bulley 2014). Here we find a similar concern with the conduct of Jekyll members, which goes beyond the platform’s highly

restrictive system of rules. Consuming the ‘right’ amount of music on Jekyll is a matter of self-regulation, unlike the automated governance of IRC discourse described earlier in the chapter. Furthermore, this analysis productively aligns with the consideration of balanced reciprocity in Chapter 8. The coercive practices of designing participation described there firmly support this chapter’s argument of a ‘class’-based governance of reciprocity and the governmentality of temperate consumption.

Standardisation and the Governance of Auality

This section addresses the process of standardisation in Jekyll, in regards to the governance of uploading and digital audio formats. Audio formats are the most frequently debated topic on Jekyll, and the guidelines covering encoding, uploading, and detecting ‘improperly’ encoded audio encompass the vast majority of Jekyll’s rules. First, I examine the long-running ‘hi-res’ debate between two ideological camps of Jekyll participants, exploring the values of Jekyll’s technical socialities and how permissible audio formats become standardized. Second, I unpack Jekyll’s standardisation of uploading and of permissible formats, noting how these administrative regulations conflate technical and aesthetic judgments in speaking about musical ‘quality’. Both sections provide further insight into the facets of music circulation and consumption practices that are governed within Jekyll.

The analysis of uploading practices is closely tied to my account of user labour in Chapter 8, further detailing the technical specificities of circulatory contribution. Contributing music to Jekyll can be compared to aqueous tributary systems, by noting how drainage systems consist of the cumulative contributions of hundreds or thousands

of smaller rivers. In much the same way, Jekyll's catalogue is assembled through the individual contributions of its participants, ranging from members who contribute a single release, to those who have individually uploaded over 20,000 torrents. As a concern with audio quality is the defining characteristic of Jekyll, uploading is the most tightly regulated domain of practice in Jekyll. Andrew Barry's work on technological societies helps unpack this governmental control over contribution. He finds that 'standardisation is critical to the formation of what I have called technological zones, and the generation of new spaces of political rule' (Barry 2001, 63). Administrative control over permissible modes of contribution strengthens staff members' ability to wield control over music circulation. Additionally, Barry argues that standardisation is processual and ongoing, as new technologies threaten to destabilise existing sociotechnical arrangements (see also Higgins and Lerner 2010). Similarly, the debates over permissible audio formats, particularly in relation to so-called 'high-res' formats, shows how emerging technologies are evaluated and governed through standardisation norms within Jekyll.

'Audiophilia' vs. 'Rationalism': The Standardisation of High-Resolution Audio

One of the longest-running debates within Jekyll concerns what could be called 'auditory epistemology', or the extent to which sound reproduction's mediations of recorded sound are audible, detectable, or otherwise knowable.⁹¹ While this has taken the form of discourse over technologies, techniques, media, genres, and disciplines, the debate over 'high-res' lossless digital audio formats is exemplary for unpacking the

⁹¹ See Sterne 2003, 218-220.

ideologies and dispositions operating within Jekyll's technical cultures.

In response to the increasing popularity of the online 'high-definition music' digital download store HDTracks and the vocal endorsement of 'hi-res' audio by singer-songwriter Neil Young, Jekyll participants began debating in 2011 how these releases should be regulated. HDTracks releases are distributed in FLAC format, at 24bit depth and a sampling rate of 192kHz, compared to 'Redbook standard' (i.e., 'CD-quality' 16bit depth, 44.1kHz sampling rate) FLACs. As Redbook standard FLACs had previously been considered the 'highest standard' for lossless audio on the tracker, participants considered how the new, putatively higher-quality format would integrate into the platform.⁹² As the debate evolved and grew more contentious, participants roughly aligned into two camps, which I (etically) call the 'Rationalists' and 'Audiophiles'. The Rationalist's central argument held that 24bit/192khz FLAC offered no practical, archival, or audible advantages over Redbook FLAC, and therefore should be banned from the site; Audiophiles, arguing from several different perspectives, believed that hi-res audio should be explicitly permitted within Jekyll rules, as some members found value in high-resolution audio.

The principal figure in the Rationalist camp was the enigmatic PU+ member JWD, whose posting history of several thousand comments was almost exclusively

⁹² Understanding why this was of significant concern to the general operating practices of the site requires an explanation of Jekyll's labyrinthine guidelines on 'trumping'. Trumping refers to a process by which a member can replace a lower-quality torrent with an 'improved' version. Valid reasons for trumping include improper album art file size, metadata errors, or, most importantly, the availability of a higher fidelity encode. As 24bit/192kHz FLAC makes claims of capturing ultrasonic frequencies and dynamic ranges excluded from Redbook FLAC, a legalistic understanding of the trumping guidelines suggests that high-def audio could replace the entirety of Jekyll's indexed lossless music.

concerned with debating against audiophiles, arguing strictly from the viewpoint of ‘maths’ and ‘rationality’. JWD described himself as a ‘recovered’ audiophile and an amateur enthusiast of psychoacoustics research. His posts on the topic often ran into the thousands of words each, typically containing citations of scientific research and frequent reference to the anti-audiophile arguments of pioneering digital audio engineer James Johnston. JWD’s central argument was that hi-res audio is not audibly distinct from Redbook audio, but its file sizes are many times larger, making it inefficient and not worthy of inclusion on the tracker. Fellow Rationalists generally relied on JWD’s authority, with many simply signaling their agreement with his arguments.

Audiophiles, on the other hand, represented a range of perspectives on hi-res audio. This included archivists, who argued that all music, no matter the fidelity, should be permitted, in order to further their goal of preserving culture; ‘phenomenologists’,⁹³ who held that they could discern an audible difference between Redbook and hi-res FLAC; and lastly, ‘deregulators’, who argued that Jekyll administration disallows too many legitimate options, and that the ‘free market’ of the torrent economy should decide if hi-res audio is valuable. These three stances were not discrete, with most archivists also believing that hi-res audio is worth archiving because it contains additional audible content and is therefore distinct from Redbook FLAC releases. The archivist position also crossed over with the phenomenologist stance with their concern for so-called ‘studio-grade’ files. The term ‘studio-grade’ suggests that HDTracks releases are exact copies received from the mastering studio, and are not subsequently re-encoded by a third-party digital distributor. Both archivists and phenomenologists understood re-encoding as a

⁹³ These names are my interpretation of the different camps held within the debate.

degenerative process, further separating the listener from the original studio 'performance' (see Rothenbuhler and Peters 1997; Shuker 2010). In debates over hi-res audio's viability, phenomenologists did cite testimonials from notable figures in the audiophile scene, but they ultimately relied on personal experience to justify the format's desirability. The phrase 'it sounds good on my system' encapsulated the core phenomenological argument, as the justification for hi-res audio circulation on Jekyll depends mostly on the unique musical pleasures these participants claimed to experience. This recourse to subjective experience was challenged by Rationalists as unscientific, and they often called for double-blind 'ABX' listening tests (see Sterne 2012) to remove bias, arguing that psychoacoustic research has shown hi-res audio to be audibly indistinguishable from standard Redbook FLAC lossless audio.

This contentious debate continued on Jekyll for almost three years until an administrative decision was finally reached in mid-2014. Jekyll's official response, authored by one of the most senior staff members, IW, is revealing of how Jekyll governance is enacted.

The phrase "relentless pursuit of perfection" is a touchstone statement of [Jekyll's] goals and standards. [. . .] Is there a limit to the practicality of ever-increasing bit depth and sampling rates? [. . .] But what is the purpose of music, and who is it for? Music is not something we as humans pursue to entertain computers, we use it to entertain ourselves, to enrich our own lives, to express ourselves, to engage meaningfully in both the narrower realm of pop culture and the wider realm of society. The music we enjoy and create helps us express who we are, discover truths about ourselves, to explore possibilities. It's a very human endeavor.

Humans, as it turns out, are fragile creatures which are limited in many ways, and one of those ways is how we process audio data. There are pitches past which we cannot hear, sampling rates which surpass the ability to encode that limited range of pitch, and bit depths which can express differences in volume past our ability to detect it ourselves, *though our computers are at hand to show us what we cannot see and cannot hear.*

What is the top-end of audio fidelity that humans can actually discern a difference between in blind tests? The good news is that it is below properly encoded 24-bit, 192 kHz audio. There is enough 24-bit, 192 kHz content uploaded (over 30,000 torrents, a bit under 2% of the site's torrents) that *determining whether or not this upper limit of practical fidelity can be captured*

below 24-bits or below 192 kHz isn't really so much about quality but whether or not we want to alienate specific sections of our community, and whether or not the educational aspect of such a rule change outweighs its moderation considerations. It's clear that the answers to these questions are "no": 24-bit, 192 kHz content is safe. Furthermore, a reasonable case can be made for those people who wish to use this content in other media (remixing, mashups, video) that a higher-than-discernible quality is useful for content which will be re-compressed. Studios have a good use case for 24-bit, 192 kHz audio, after all.

Those practical considerations start breaking down shortly after this, though. At some point, a retailer or web store charging for high-resolution high-bit-depth content is not engaged in audio preservation nor even pandering to an audiophile minority so much as deliberately misleading the public about what it can and can't hear [. . .]

The new ceiling for [Jekyll] uploads is 24-bit, 192 kHz. This isn't to say anything positive or negative about the various arguments for and against 24-bit, 192 kHz audio, but rather to draw a line in the sand and say something much clearer: there is no purpose to [Jekyll] offering 32-bit content at sampling rates of 384 kHz and above.

IW 2014; emphasis added

This explanation of the administrative decision-making process illuminates what is at stake in the governance of audio formats. First, it demonstrates the process of standardisation at work, and also how standard-setting becomes a vector of circulatory governance. In this official response, IW engages with the question of which qualities of audio formats should be used in Jekyll standardisation. Despite his acceptance of the overall inefficiency of hi-res audio, IW determines that the format's current popularity is sufficient for making it an acceptable standard. IW's acknowledgment of how rule changes could potentially 'alienate specific sections of our community' show how the social implications of Jekyll standardisation outweigh even musical and audio quality considerations. Secondly, the reference to the 'educational aspects' of Jekyll standardisation evidences the difficulty of governing a sociality that contains fundamental disagreements about the nature of digital audio. IW implies that the epistemological disagreements between the Rationalists and Audiophiles are insurmountable, and does not attempt to contradict the central arguments put forward by the Rationalists.

Standardizing 24-bit, 192 kHz FLAC as the ‘highest’ permissible format is a compromise position, in which neither side fully accepts as ideal. For phenomenologists, enforcing a ‘ceiling’ on high-resolution audio formats excludes newer releases in aimed at the audiophile market. Conversely, rationalists believe that high-res audio is inherently inefficient and should never be allowed. The rationalist position holds that standardisation equals an implicit endorsement of the format, and Jekyll’s uploading rules should to be used to ‘teach’ its members that HDTracks offer no audible differences from Redbook audio. IW’s post indicates how Jekyll administration recognizes the importance of the ‘public good’, eloquently pointing to the need to reach consensus. The tenor of this debates show how ‘media ideologies’ (Gershon 2010) are performed, as well as dramatising how platform governance shapes circulation practices.

Governing Contribution: Ripping, Encoding and Uploading Practices

In this section, I explore the how musical objects enter into circulation on Jekyll. I examine three most common types of media from which Jekyll uploads are sourced: digitally-distributed audio files, which are called ‘WEB rips’; audio from compact discs, ‘CD rips’; and audio encoded from a phonograph record, ‘vinyl rips’. Analysing participants’ understandings of media affordances show how technical literacy and labour-intensive uploading practices generate prestige within Jekyll. Furthermore, the close regulation of contribution and the fidelity standards around audio fidelity shows how music itself is governed on Jekyll.

WEB rips are the most commonplace source medium, and contributing these releases is fairly straightforward.⁹⁴ The required process of uploading WEB releases is as follows: first, the uploader acquires lossless FLAC files from either a licensed digital distributor or an alternative extralegal platform. Next, the uploader is required to analyse the files with specialized software to confirm that the release is not a ‘lossy’ transcode. A file is considered ‘lossy’ if it has been transcoded from a lossless format (e.g., wave or FLAC) to a lossy format (e.g., MP3), then back to lossless, significantly lowering the fidelity of the audio.⁹⁵ The uploader then manually adjusts the metadata to match Jekyll specifications. She then typically transcodes the release into 3 lossy formations, MP3 CBR 320, MP3 V0, and MP3 V2, generates torrent files for each of the four format types, and uploads each torrent to the tracker.

CD rips, while declining in popularity, still represents the second most common format type. While the uploading process includes the same metadata and formatting requirements as the previously-described WEB rips, further layers of regulation govern CD transcoding processes. On Jekyll, transcoding relates to what Jonathan Sterne refers to as the ‘dream of verisimilitude’ (Sterne 2012, 31): the pursuit of aural equivalency between media and reality. In the case of Jekyll, this dream is not an imagined lack of

⁹⁴ While CD rips are more common than WEB rips in terms of the total Jekyll archive (CD rips represented approximately 55% of torrents as of March 2016, with WEB at approximately 30%), new releases are much more likely to be WEB sourced than from a CD, due to the sharp decline in commercially distributed CDs.

⁹⁵ As preventing improperly-encoded audio from circulating is one of Jekyll’s ‘golden’ rules, one of the strongest governmental impulses for contribution is to preemptively screen all uploads for signs of bad ‘transcodes’. The primary way this is performed is to run audio files through a spectral analysis utility, and the Jekyll wiki contains sample screenshots of ‘true’ lossless spectral outputs versus ‘lossy’. While determining if a release is a bad transcode is putatively objective, in practice it is a matter of auditory and technical judgment, with potential uploaders frequently employing the help of other Jekyll members to determine the quality of their contribution before moving forward with the upload.

translation between media and reality, but rather, defines physical formats as an instantiation of musical reality. As music's source medium is taken as a reality to be replicated exactly, Jekyll uploading guidelines espouse a musical ontology of the recording as 'the real'. Jekyll contribution regulations require uploaders to 'exactly' replicate the CD audio throughout the transcoding process. Contributors use specified audio encoding applications, most commonly Exact Audio Copy, to produce 'log' files that document the encoding process, check for errors, and report the 'accuracy' of the rip. On Jekyll, any CD rip that does not include a '100% log' (denoting a rip that matches bit-for-bit the PCM audio encoded on the CD) can be replaced by a new, 'exact' rip. A second required file, called the 'cue', contains disc information, such as the order of tracks and the length of silence between them, so that downloaders can burn their own CDs that precisely resemble the data structure of the retail copy.

Vinyl rips, the least common of the three primary source formats, presents the most complex technical challenges during the ripping and uploading process. Unlike with CD rips, where log files quantify verisimilitude, vinyl rips are judged through audition. With the shift from technological to auditory analysis, 'golden ears' tropes of audiophile culture come to the fore (Perlman 2004). The quality of a rip is determined by various subjective criteria, including its dynamic range, frequency spectrum, and the minimization of surface noise, such as glitches, pops and clicks. The rip's 'lineage', a text file documenting the ripping process, is equally important for judging the acceptability of a vinyl rip. Necessary information includes the physical condition of the record; the stylus, cartridge, turntable, and the condition of each; the phono stage or preamp; the digital sound card connected to the preamp; the software used to capture audio; any

issues encountered during the ripping process; and a list of all post-production techniques, which includes high-pass filters, denoise processes, fades, click removal, and normalization. Vinyl lineages are understood as a genealogy of the transcoding process. When reading a lineage, participants follow the entire process of the rip through the lineage notes: one 'reads along' while listening and evaluating.

```

1. Cleaned with KAB EV-1
2. Lyra Delos Cartridge
3. JMW-10.5i Tonearm
4. VPI Classic 1 Turntable
5. Denon AU-300LC Step-Up Transformer
6. Pioneer SA-7500 Preamp
7. Recorded with Audacity
8. ClickRepair 3.4.1 in manual mode
9.
10. =====
11. foobar2000 1.2.3 / Dynamic Range Meter 1.1.1
12. log date: 2013-04-13 12:00:00
13.
14. -----
15. Analyzed: Godspeed You! Black Emperor / 'Alleluiah! Don't Bend! Ascend!
16. -----
17.
18. DR          Peak          RMS          Duration Track
19. -----
20. DR11        -2.18 dB     -16.38 dB     19:51 01-Mladic
21. DR10        -1.24 dB     -15.14 dB     6:26 02-Their Helicopters' Sing
22. DR11        -1.15 dB     -16.67 dB     19:54 03-We Drift Like Worried Fire
23. DR11        -2.73 dB     -19.34 dB     6:25 04-Strung Like Lights at Thee Printemps
    Erable
24. -----
25.

```

Figure 20. An example vinyl rip lineage file.

The varying degrees of governance and prestige associated with uploading standards powerfully demonstrate the values of Jekyll's technological socialities. These uploads are, on one hand, comparable objects exchanged within a torrent economy based

on balanced reciprocity, which attempts to treat all circulated content as equal and reducible to its file size within the ratio system. Yet, at the same time there is a clear hierarchization of sourcing on Jekyll. ‘Good’ vinyl rips are the most difficult to produce. They require elaborate analogue-to-digital technical assemblages, advanced digital audio mastering knowledge, and are subject to the highest level of scrutiny from staff and participants. As a result, vinyl is the most desirable upload format, granting significant prestige to the most famous and ‘skilled’ vinyl rippers. CD rips, when accompanied by documents ‘proving’ verisimilitude, are considered the most ‘accurate’ source. WEB rips, lastly, offer the lowest degree of lineage documentation, as any DRM or digital watermarks are required to be removed before uploading. Therefore, WEB rips are the most commonplace and ‘uninteresting’ medium, gaining the lowest level of prestige for their contribution.

In regards to source media, Jekyll has formulated ‘media ideologies’ (Gershon 2010) for vinyl, CD and WEB formats, assigning value to uploads based on technical as opposed to musical attributes, which subsequently shape the Jekyll catalogue. The prestige of vinyl generates an ‘inflationary cycle’ (Born 1995, 91), in which participants decide to rip vinyl records in pursuit of prestige, reinforcing the hierarchical position of the vinyl medium on Jekyll. The insistence on ‘lineage’ is quite clearly an exclusionary tactic. Much of the digital music circulated elsewhere online has no clear markers of origination, and the fidelity of others’ encodes are not easily measured. Furthermore, the punishment for uploading ‘bad rips’ is severe, including the possibility of losing upload privileges or even account termination. Due to this, most users are unwilling to contribute missing releases — including extremely rare objects — without definitive knowledge of

the file's lineage, evidencing the lengths to which Jekyll enforces its ideologies of 'fidelity' and 'quality'.

In the following section, I offer a comparative analysis of automated governance in both field sites, noting how governmental technologies reinscribe the social imaginaries of these platforms as technical cultures, wherein technicity and technological literacy are highly valorized.

Automation and Technical Prescriptions of Governance

Administrative Governance by Technical Design: The 'Bots' of Jekyll

This section begins the examination of Jekyll's governance through technical design by considering the governmental responsibilities of Jekyll's 'bots'. The term bot here can be understood as complex scripts written to automate aspects of managing, governing and maintaining the social and exchange systems of a given platform. Bots vary in purpose, complexity, and interactive capacity, so this analysis focuses on the most significant and influential bots for Jekyll usage, beginning with Drone.

Drone is in actuality not a singular entity. Several different functions are carried out under the name Drone, and staff members occasionally take control of Drone's communications capabilities to make announcements or perform governmental tasks. Drone's primary responsibilities are to regulate IRC behaviour; gatekeep access to protected channels on the IRC server; 'announce' newly uploaded torrents; govern the advancements, demotions and restrictions assigned by the user class system; and to

monitor and report BitTorrent swarm statistics to staff members.⁹⁶ These represent several of the key responsibilities of circulatory management on Jekyll. The tracker would not properly function without Drone, demonstrating the administrative reliance on automated governance. I will focus on two of Drone's tasks to draw out how automated governance in the form of the Drone bot shapes the everyday experience of Jekyll participants.

Within the private tracker scene, a restricted access IRC server is commonplace, necessitating a rigorous but automated gatekeeping function. The very concept underpinning Jekyll's 'privacy' is that the platform's circulation, discourse and its collaboratively assembled index must be closed off to non-members; otherwise, Jekyll would be classified as a 'public' tracker. Yet, a conventional, password-protected IRC server is not sufficiently flexible for Jekyll's social functionality. Members could distribute the password to non-members, and there are legitimate reasons for non-members to access certain channels on the IRC server. Namely, prospective members use IRC to interview to join the site, and inactive, disabled, or 'locked out' (i.e., users who have forgotten their login details) members use a dedicated IRC channel to request restored access to their account. Therefore, channel-specific automated gatekeeping is necessary, one that can track account status and user class level, and award appropriate access. One of the first actions newly registered Jekyll members take is configuring Drone access, linking their temporary IRC handle (created during the interview process) to their new account ID number and passkey, which then authorizes the member to access

⁹⁶ Numerous other automated backend scripts have been introduced into Jekyll's architecture. These functions include periodically disabling inactive users (thereby freeing up resources to serve new and active members) and purging inactive torrents. Non-staff members do not see these functions carried out.

class-appropriate channels. These channels include the social spaces described in Chapters 3, 5 and 6, along with several essential site functions, such as general chat, technical assistance, and torrent announcements. Each login to Jekyll's IRC requires connecting to the IRC server, then private messaging Drone the user ID and passkey, which 'authorizes' the member and opens access to his or her permitted channels.

IRC bots like Drone are also involved in the everyday governance of acceptable sociotechnical behaviour, including restrictions on 'spamming' and flooding'. One of the most notorious events in the history of Jekyll is instructive here. In late 2012, a former member, ZO, joined the publicly accessible IRC help channel, requesting administrative assistance in reactivating his lost account. An administrator explained that no account had ever been active under his requested username, and as such, they would be unable to assist him. ZO subsequently began a denial-of-service attack⁹⁷ on the primary website's IP, preventing the entire user base from accessing the index. Discussions of the DoS dominated the next several hours of IRC activity, with ZO continuing to escalate threats and promising to keep the site offline for an extended period of time. After hours of ignoring ZO's threats and investigating options for mitigating the DoS, one of the administrators, AA, began to repeatedly post an 'emoticon', a representation of a face using punctuation marks, meant to indicate a particular emotion. The emoticon AA used represents a look of disapproval. A relevant portion of the (pseudonymised) chat log is reproduced below:

<[AA]> ಠ_ಠ

<[User1]> [ZO] you aren't the first person to try this fyi [for your information]

⁹⁷ A denial-of-service attack is a common cyberattack method that attempts to overwhelm an internet resource by flooding it with requests, and is examined further in Chapter 10.

<[ZO]> AA, instead of doing these stupid ๓_๓
<[AA]> ๓_๓
<[ZO]> start thinking what to do
[. . .]
<[AA]> ๓_๓
<[AA]> ๓_๓
<[ZO]> YOU KIDS
<[User2]> ๓_๓
<[AA]> ๓_๓
<[User3]> ๓_๓
<[AA]> ๓_๓
<[ZO]> STOP THESE ๓_๓
<[User4]> ๓_๓
<[AA]> ๓_๓
<[User2]> ๓_๓
<[> ๓_๓
<[User5]> ๓_๓
<[User6]> ๓_๓
<[AA]> ๓_๓
<[User3]> ๓_๓
<[AA]> ๓_๓
< [AA] > ๓_๓
<[User1]> ๓_๓
<[User7]> ๓_๓
<[User5]> ๓_๓
<[AA]> ๓_๓
<[AA]> ๓_๓
* Drone: irc.[jekyll]-network.net has kicked [AA] from #[jekyll]-help (Channel flood triggered (limit is 7 lines in 3 secs))

Drone’s automated discourse moderation demonstrates what sorts of behaviours are captured and governed automatically. Here, although ZO is disrupting access to the site and threatening individual users with ‘hacks’ and other forms of online aggression,

the rapid, repetitive comments (called ‘flooding’, here defined as 7 lines of the same text in under 3 seconds) posted by one of Jekyll’s own administrators is interpreted by Drone as antisocial and worthy of removal. Flooding is considered a form of ‘spam’, an inherently contingent and relative behaviour, defined only as messages containing undesirable, disruptive, repetitive or unrelated content. This vignette evidences the limitations of automating the governance of antisocial conduct. In this case, flooding the chat with the ‘look of disapproval’ emoticon was intended to ‘drown’ out the actually antisocial behaviour of ZO.

A closely related incident from my fieldwork observation also evinces the limitations of governmental automation. In August 2013, a friendly discussion regarding an optical illusion shared in the chat by member VY became quickly hostile when a second member, FT, accused the original poster of being pretentious, uninteresting and disruptive. After a long and heated exchange, a third user, MZ, began flooding the ‘.np’ command (which is normally used to request the last.fm bot to post the user’s currently playing song, one of the most common bot actions on the channel), putatively to ‘hide’ the discussion from his client’s feed. In his own words, he began flooding ‘to get the quite frankly, rude conversation gone’. A fourth user pinged one of the moderators, who subsequently took control of the channel, removed posting abilities for everyone else, instructed all members to cease arguing and flooding or face further consequences, and then reopened the channel for chatting after a ‘cooling off period’.

The necessity of administrative intervention here suggests two points of interest. First, MZ’s circumvention of automoderator controls — spamming a bot command instead of typing conversational text to avoid triggering the anti-flood detection script —

is an inventive example of bottom-up circumvention. Knowing that circumventing automoderator restrictions would bring staff attention to the chat, MZ behaved ‘antisocially’ in the hopes that a staff member would restore order to the chat and terminate the unpleasant discussions. Secondly, the simplicity of MZ’s circumvention is indicative of both the limitations of bot-based governance and the constant necessity of human intervention in the technical administration of Jekyll.

Spotify and the Automation of Taste

In this section, I examine several components of Spotify’s algorithmic recommendations, expanding on my consideration of Spotify’s individuated design in Chapter 7, and setting up productive points of comparison with Jekyll’s modes of automated governance. By considering several popular listening modalities within Spotify, we see that Spotify’s design inscribes projected users, governmentally shaping how music is consumed on the platform.

The previous section’s focus on Jekyll’s automated governance of discourse in its IRC server is striking when compared to Spotify, in that there is no similar mode of synchronous communication to be regulated within the Spotify platform. Indeed, Spotify users’ ability to engage in musical discourse within the platform is highly curtailed. The automated governance of Spotify users mostly takes the form of inscribing projected users into the design of the platform. With Spotify’s current focus on shaping individuated experiences, the most popular listening modalities within the platform decrease individual choice, instead emphasizing context-aware, automatically-generated consumptions. This includes the ‘Now’ menu (Spotify’s default mode upon opening the

application), which analyses individual listening habits in relation to daily routines (e.g., morning commute, late night, etc.) and proffers quick links to the user's most frequently listened to albums, artists and playlists within that setting; 'Party Mode', which creates beat-matched and cross-faded playlists based on the user's chosen genre and mood, automating the creative labour of DJs; and most significantly, the Discover Weekly and Fresh Finds playlists, two algorithmically curated playlists that I will examine further.

Discover Weekly, Spotify's most popular individuated listening modality, generates a thirty song playlist each Monday for every Spotify user account. This is assembled from recommendations based on the user's taste profile – the map of individual aesthetic preferences based on aggregate data from the user's recent listening history (Pasick 2015). The Discover Weekly algorithm examines the taste profile, finds 'tastemaker' users (the users described in Chapter 6 whose playlists have many followers) who have listened to some of the same songs, and combs these tastemakers' playlists for related songs. Discover Weekly uses this data to assemble each week's Discover Weekly playlist, even reusing the track order from tastemakers' playlists in order to emulate the 'flow' of human curated playlists.

Discover Weekly's algorithmic recommendations have proven so popular that some users have begun exploring alternative modes of circulating its selections. One informant, MH, explained that she and her circle of friends (mostly urbanites employed in the tech sector, and self-styled 'eclectic listeners' in their early 30s) followed each other's Discover Weekly playlists, as their shared musical affinities musical taste were articulated through similar music selections by the Discover Weekly algorithm. This automated and individuated playlist generator, whose output is here redistributed to other

user accounts, is one of the most striking examples of the entanglement of human curation and automated agents within Spotify. For this group, MH's personal Discover Weekly is emblematic of her current interests, and following each other's Discover Weekly playlist affords a socially-imbued method of music discovery. Here, the individuated Discover Weekly playlists become socially circulated objects, carrying inalienable markers of each user's musical identity. Reminiscent of MZ's bottom-up manipulation of automated moderation in the previous chapter, MH and her friends have reworked the individuated experiences of the algorithmically-generated Discover Weekly playlist.

Automated curation utilities are also used for curating many of Spotify's other playlists, which purports to offer users access to the listening trends of the platform. Fresh Finds, which is described as identifying 'up and coming' new music before the artists are widely known, crawls music blogs to identify emerging artists. Next, it locates the users on Spotify who are already listening to these artists, and then marks these users as trendsetters, inferring that their early awareness of 'trending' music means they are adept at identifying nascent artists (Pasick 2016). The newly released, not-yet-popular music these trendsetters discover each week is compiled by Spotify staff into 5 genre-delineated playlists and released each week as the 'Fresh Finds'. Notably, each subscriber to Fresh Finds receives the same playlists, as opposed to the individualized Discover Weekly system.

Fresh Finds exemplifies how Spotify inscribes projected usage into its design.⁹⁸ ‘Freshness’ and ‘discovering new music’ have become so heavily emphasized by Spotify’s design that alternative approaches to music consumption appear to be discouraged. In general, many informants felt that Spotify was best used for ‘discovery’ listening modalities. As mentioned in Chapter 4, my Jekyll informant SP primarily used Spotify to find new music, and would download his favorite discoveries through Jekyll. Viewed in light of Akrich, I interpret his polymedia practice as not only indicative of the relational affordances of each, but also as indicative of Spotify’s ‘projected users’. SP felt that Spotify restricted his ability to repeatedly listen to particular musics by deprioritizing ‘old’ music in the design of the platform: older playlists become ‘lost’ by being pushed further down in the playlist menu, and algorithmically generated playlists like Discover Weekly and Fresh Finds are refreshed weekly, permanently deleting the last week’s suggestions. SP’s belief that Jekyll was better suited to ‘long-term listening’ reflects the governmental inducements of both platforms: if Spotify encourages lean-back absorption of individuated recommendations, Jekyll equally persuades its members to conform to particular modes of consumption, which I examine in the next section.

Spotify’s valorization of technical solutions, symptomatic of technological socialities, is reminiscent of what Born calls the ‘recourse to technology’ (Born 1995, 15). With this shift in emphasis from a massive, searchable library of streamable content to an algorithmic system of passive playback, Spotify technologically rationalises

⁹⁸ Additional, Fresh Finds continues to perpetuate ‘tastemaking’ as an activity carried out by specialized curators, except here they are unremunerated listeners, rather than music critics. This also strengthens Chapter 8’s arguments regarding Spotify’s appropriations of users’ curatorial labour.

consumption, a mode of governmentality concerned with ‘configuring the user’ (Woolgar 1990) to produce ideal subscribers. Although Woolgar argues that all technologies configure the user, Spotify goes further than earlier digital music platforms in its intensification of the rationalisation of musical affinities. As Spotify Director of Developer Platform Paul Lamere writes in regards to his Zero-UI project, ‘The goal is to create a music player that knows the best next song to play for you given your current context. No button pressing required’ (Lamere 2014). Framed as a solution to capturing the attention of otherwise indifferent music consumers, it is also an effort to subsume individual choice and agency, governmentally instructing its subscribers that ‘hands-off’ or ‘lean-back’ listening is a desirable mode of music consumption. However, as I will address in the next chapter, ‘hands-on’ circulation is precisely what engenders strong social relations, and these connections are invaluable in the maintenance of circulatory connections in the face of disruption or adversity.

The Dialectics of Circumvention

Emergent anarchic forms evolve out of ‘software social’ practices as (in the case of file sharing specifically) the downloading masses risk potential punishment and *the code-adept develop or utilize technical circumventions.*

da Ramini 2013, 313 (emphasis added)

In this section, I consider the creation by users of several incarnations of circumvention technologies, and their affordances, as well as their role in shaping both Spotify and Jekyll. The evasion of technologically enforced regulation is central to the circulation and consumption practices of users of both platforms. My adoption of the term ‘circumvention’ to theorize this body of circulatory activity is taken from the

influential 1996 World Intellectual Property Organization (WIPO) Copyright Treaty as well as its intensification in the 1998 US law the Digital Millennium Copyright Act (DMCA), which subsequently influenced the global internet due to the United States' central regulatory power over Internet access. Article 11 of the WIPO Copyright Treaty offers rightsholders 'legal protection and effective legal remedies against the circumvention of effective technological measures that are used by authors in connection with the exercise of their rights' (WIPO 1996). Section 1201 of the DMCA, 'Circumvention of copyright protection systems', extensively outlines the forms of technological protectionism afforded to copyright holders, and defines circumvention as 'to avoid, bypass, remove, deactivate, or impair a technological measure, without the authority of the copyright owner' (ibid.).

Technical circumvention as a point of scholarly interest has recently been addressed in media studies (Lobato and Meese 2016). I want to connect this formulation of circumvention more generally to analyses of file-sharing culture and 'piracy' itself,⁹⁹ with Francesca da Ramini's 'tangled hydra' (2013) metaphor being of particular interest. Circumvention is closely related but not limited to da Ramini's depiction of file-sharing cultures as in a constant state of defensive and reactive flux, gaining and losing participants, and deflecting regulatory inference. I contend instead that circumvention can be conceived in terms of a dialectic with governance. It is discernable by the degree of its

⁹⁹ While elsewhere I have avoided the term 'piracy' in favour of 'file-sharing', 'extralegal', and 'unlicensed', I argue that the extent to which Jekyll users can be said to engage in piracy, or 'piratical' action, is visible here. This is in the sense that the aims and motivations of these circulatory actions are not primarily musical, social, or economic in nature, but rather, focus on the avoidance and overcoming of social and hierarchical imbalances, aligning with Dawdy and Bonni's 'general theory of piracy', which is based on the urge to 'resist the most monopolistic phases of capitalism's cycles' (2012, 695).

opposition to technically prescribed restrictions, restrictions that occur across scales, from Jekyll's highly regimented torrent economy and Spotify's 'walled garden' (Mehra 2011) to the larger dynamic of transnational internet regulation. Circumvention technologies' affordances include the avoidance of identity detection, the acceleration of available bandwidth and circulatory potential, and the sidestepping of region-specific access restrictions. Circumvention thus relates to governance in that it is one of the means by which individuals inventively resist, subvert or deflect the directives of platform design. For Spotify users, I will show that circumvention takes the form both of anonymization and resisting geoblocking in a system built on accumulating accurate and region-specific user data, and of disabling advertisements and capturing streaming audio; whereas for Jekyll users, circumvention takes the form of evading the restraints and limitations on circulation built into the ratio system through the use of seedboxes and VPNs.

Ad Blocking on Spotify

Audiovisual advertisements are a ubiquitous component of internet cultures, and as such, utilities and technologies for avoiding, hiding, otherwise circumventing advertisements are similarly commonplace (see Kushmerick 1999). While using Spotify's 'Free' mode, playlists and albums are periodically interrupted by audio advertisements, and banner ads are consistently visible within the client. Informants uniformly describe the interruption of Spotify's advertisements as highly unwelcome, leading to the development of user scripts that disable Spotify's audio ads.¹⁰⁰

¹⁰⁰ See Vratonjic et. al 2013 on advertisement-supported digital content circumvention.

However, the process of muting Spotify ads is more complex than conventional web browsing ad blocking. The Spotify desktop application contains an anti-circumvention subroutine that monitors the sound card's status, and will automatically pause advertisements if the sound output is muted. Once sound is unmuted, Spotify immediately resumes playing the ad. This surveillance technology extends beyond the platform itself and into lower-level operating system status, and is almost unprecedented in advertisement delivery platforms. This supports this chapter's analysis of the top-down governance of circulation platforms, which not only conditions its users to accept the interruptions of listening sessions, but also forces users to actually *hear* its advertisements. Several user scripts have been circulating online that proffer workarounds to enable the automated muting of Spotify ads. One of these, a Applescript package called Spotifree — which was also publicized on Lifehacker (Gordon 2011), suggestive of the mainstreaming of extralegal circumvention utilities appearing with the rise of streaming services and their onerous intensification of DRM design — originally functioned by automatically reassigning the audio output device at the commencement of ads, in effect 'dumping' the audio onto an unmuted yet inaudible audio playback component. Forums within file-sharing scenes regularly discussed new and updated techniques for blocking Spotify ads, as new updates to the platform often caused Spotify ad blockers to stop working.

Audio Capture on Spotify

One of the most significant liabilities of the rentier streaming model is that users may discover how to permanently store their streaming libraries, negating the need for

ongoing engagement with the platform. The key facet aspect of the Celestial Jukebox that fascinates the recording industry is that it re-encloses digital music circulation, reintroducing rigorous DRM protection that has fallen out of favour in digital download platforms (Burkart and McCourt 2006, 104). Streaming audio ripping utilities — commonly referred to as ‘YouTube to MP3’ services due to YouTube’s global dominance in the ad-supported streaming content sector — are commonplace and are largely immune to the regulatory challenges that have tempered other popular forms of file-sharing (see Lindvall 2013; Ortega 2014). Spotify has consistently positioned its platform as combatting ‘piracy’, both in that it is successful in converting extralegal consumers into paying customers, and because of the platform’s sophisticated implementation of DRM (Page 2013). With this in mind, the relative ease by which music can be captured, ripped, or otherwise downloaded from Spotify is both surprising and also a testament of the importance of circumvention technologies in music circulation. The open-source code repository Github hosts several collaborative projects that afford end users the ability to download entire playlists in DRM-free MP3 format via Spotify’s Web API. These ‘Spotify downloader’ exploits have been acknowledged by and are regularly stymied through software updates by Spotify developers. However, audio capture software applications — a genealogical ancestor of ‘home taping’ (Bottemly 2015) — are inherently immune to Spotify DRM prevention, as the audio capture program functions outside of the platform’s purview. These audio capture programs record the current streaming song on Spotify directly to the hard drive, creating a permanent copy of all streamed music for the user.

Even as the circumvention/regulation dialectic continues to bring about new audio ripping methods, audio capture technologies expose a fundamental aspect of the governance digital cultures. Namely, no conceivable technical arrangement can wholly extinguish commercially undesirable bottom-up user practices. Audio ripping demonstrates that not all consumption within licensed music services is permissible, and that ‘piratical’ practices can still emerge within strictly governed platforms (Balász 2014).

VPNs and Identity on Spotify and Jekyll

[The] very character of the internet can be expressed in terms of anonymity and identification.

Larsson et. al 2012, 262

In this section, I address the role of Virtual Private Networks (VPN) in facilitating circulation, and how identity is obscured and negotiated through these technologies. Virtual Private Networks (VPN), in their conventional utilization, are deployed primarily to enable remote access to local networks, ‘tunneling’ a connection to the local host. While its most common use is to allow permitted users access to private resources, VPNs offer two technical affordances useful for extralegal file-sharing. First, the publicly visible IP of a user with an active VPN connection is that of the VPN host, as all incoming and outgoing traffic is handled there. Therefore, if the VPN provider does not keep detailed records of its subscribers, VPNs effectively anonymize users from regulatory agencies. Secondly, as a result of the tunneled connection, the nature of the user’s traffic is obscured, even to the user’s ISP. Neither the protocol nor the contents of

the network traffic are decipherable by parties outside the VPN host and the end user. For those whose ISP restricts the use of file-sharing protocols,¹⁰¹ VPNs offer a workaround, circumventing regulations designed to prevent extralegal file-sharing.

Fredrik Andersson (2013) argues that VPN usage is one of file-sharing's most distinctive features, contrasting its usage to the fully individualized data mining of streaming services. While VPN usage is a vital technical component of most popular file-sharing platforms active today, Jekyll itself has implemented several restrictions on VPN usage that limit their capacity to anonymize members. VPN's affordance of the obscuring of identity directly subverts one of the private tracker's scenes most intriguing paradoxes. Jekyll members, too, must submit to infrastructures of monitoring and metering, which are potentially circumvented through VPNs, but Jekyll members are prohibited from accessing the IRC channel, forums, and torrent index while using a VPN. Most importantly, users must not be connected to a VPN when they obtain torrent files from the index. Jekyll rules state that accessing the index through a VPN is punishable by losing one's account, due to the possibility that Jekyll members could use VPNs to create multiple accounts. Even more importantly, if copyright enforcement agencies gained access to Jekyll through an existing member's account, they could potentially acquire incriminating information about other Jekyll members.¹⁰²

In practice, most offenders of the VPN rules are first 'warned' (through a formalized system for tracking rule violations) before being banned from the tracker.

¹⁰¹ Restrictions on BitTorrent, especially on secondary ISPs such as university campuses, are increasingly common.

¹⁰² An unconfirmed rumour within Jekyll suggested that Jekyll administrators held an extensive list of IP addresses that copyright enforcement agencies used to track down offenders. These addresses were supposedly banned from Jekyll. In theory, a VPN would disguise that the member is logging in from a banned IP range.

Furthermore, in the first several years of Jekyll's existence, members were expected to only ever visit the site on their home internet connection, and were required to inform administrators before moving home. While this restriction has been mostly lifted, IRC interviews must be conducted from the user's home Internet connection. This is so that the member's primary location can be recorded and evaluated to confirm that it is a genuine residential IP address and aligns with the user's country of domicile. The only acceptable usage of VPN within Jekyll is to disguise and encrypt BitTorrent traffic from ISPs. Jekyll's guidelines explain how to configure VPN connections to only handle the BitTorrent client, leaving the web browser and IRC client 'open' and undisguised.

VPNs were also present within Spotify user practices. Spotify's now global technical infrastructure was still in its nascent stages in 2012 after launching in Sweden four years earlier and a limited global expansion. After a 'soft' invite-only launch in the United States in 2011, demand for Spotify accounts exceeded the supply, while Swedish residents were still able to register new accounts freely. This regional disparity led to a surge in interest for Swedish-based VPN services.¹⁰³ These VPN services circumvented the geoblocking restrictions within the Spotify platform, as it offered users valid Swedish IP addresses and afforded Spotify account registration. High-quality VPNs were capable of routing the streamed audio content to the user's device with surprisingly negligible latency issues. The mainstream tech blog Lifehacker even published a thorough walkthrough on circumventing Spotify's geoblocking, with a step by step guide for navigating the necessary technical arrangements (Pash 2011). I found several Spotify

¹⁰³ The popular BBC video streaming service iPlayer, which is similarly region-restricted, has witnessed a similar pattern of international users utilizing VPNs to register accounts that appear to hail from the UK (Elkins 2015b, 196).

geoblocking circumvention utilities during my early observation of Spotify, including an open-source project that automatically located suitable proxy servers, simplifying the circumvention process for less technically advanced users. My key Spotify informant MF revealed that he unsuccessfully attempted to register with Spotify through a VPN in 2011, and was unable to join the service until receiving an invitation in 2012. This usage of VPN to circumvent geoblocking was not only limited to the United States. During fieldwork, I regularly discovered forum and Twitter posts about VPNs from users in regions where Spotify was not available (see also Elkins 2015a).

While VPNs are a technique of anonymization, the components they obscure differ in Jekyll and Spotify VPN usage. In Jekyll, the only permitted use of a VPN is to anonymize BitTorrent traffic from the ISP, as the ‘identity’ of each member must still be authorized by the private tracker. In Spotify, VPN users disguise their geographical identity but remain otherwise identified by the service. In both platforms, the use of anonymization technology is oriented towards the circumvention of regulation; in the first case, the circumvention of file-sharing protocol blockages, and in the second, the circumvention of licensing restrictions enacted by global intellectual property regimes.

Seedboxes and Jekyll Ratio System Circumvention

In this final section, I consider the most commonplace and controversial circumvention technology in use within Jekyll: personal web servers, generally hosted in high-bandwidth data centers and designed specifically for high-speed P2P data transfer, referred to as ‘seedboxes’. These servers are among the most frequently discussed components of Jekyll’s technological ecology within its social spaces, and yet their

influence over the torrent economy and ratio system has largely gone unexamined in the literature on BitTorrent trackers.¹⁰⁴ Seedboxes are used to circumvent the ‘spirit’ of Jekyll’s ratio system, as they allow members to download high quantities of music without the requirement to contribute new music to the tracker. The debates over the acceptability of seedboxes gives insight into the tension between circumvention and governance, and also how seedboxes affect the Jekyll torrent economy, particularly those who do not use seedboxes.

A seedbox is configured with a BitTorrent client optimized for high-bandwidth usage, allowing users to download and upload music much more quickly than is possible on the majority of residential broadband connections. The primary difference between seedboxes and inexpensive web servers is that seedbox providers are marketed within the private tracker scene as ‘BitTorrent friendly’, and typically cost more than an equivalent web server.¹⁰⁵ Although intentional copyright infringement is generally disavowed in the Terms of Service agreements, in practice seedbox providers readily accept that their services’ primary usage involves the extralegal circulation of digital media.¹⁰⁶ Seedboxes handle all BitTorrent data exchange for the user, and downloads are transferred to the user’s personal device after completion.

¹⁰⁴ Rossi et. al 2014 is a notable exception, but addresses seedboxes from the perspective of network administration.

¹⁰⁵ Subscription packages are distinguished in terms of storage space, maximum bandwidth capacity, and maximum monthly traffic, much like any web server provider. Prices fluctuated over the course of fieldwork, but as of early 2014, the most popular provider’s £10/month plan included at least 1TB of storage and 150MBps network capacity, and costs for the most powerful boxes were over £100/month.

¹⁰⁶ This is not to say that seedbox providers are unconcerned with copyright infringement enforcement. Of the two most popular seedbox provider companies on Jekyll, one specifically restricted the use of their products on public trackers, and the other informally requested that their subscribers only use private BitTorrent trackers. This is due to the lack of ‘security’ on public trackers.

Seedboxes illuminate a disconcerting aspect of the technological economy of private trackers, wherein the BitTorrent protocol prioritizes high-bandwidth peers and thus inherently favours seedbox users. Due to BitTorrent's 'peering' design, in which the swarm is evaluated for the closest and highest bandwidth seeders (see Pouwelse et. al 2005), seedbox seeders are almost always selected first to upload data, especially when content is being exchanged between seedboxes within the same data center. On Jekyll, seedboxes consistently absorbed the vast majority of upload credit on torrents, making conventionally connected peers (i.e., connected via a residential ISP) less competitive in the torrent economy. In this way, seedboxes afford the acquisition of symbolic capital without significant circulatory labour, and as such are seen by many as circumventing the spirit of the site's ethos of temperance and balanced reciprocity as detailed in Chapter 8.

Informants who hold seedbox subscriptions cite its ability to ease ratio system requirements as its primary benefit. I spent several in-person participant-observation sessions with my key informant SP, discussing and observing the effects of a seedbox on his personal music consumption practices. Notably, SP's seedbox made the process of acquiring music more complex, due to the additional technical literacies seedbox configuration requires. SP explained that he considered a seedbox essential to experience 'freedom' from Jekyll's ratio system, and that ratio circumvention was the only reason he used a seedbox. While his early period of Jekyll membership was characterized by a constant struggle to maintain an acceptable ratio, his use of a seedbox generated a substantial buffer, affording him the ability to download dozens of gigabytes of new music a month.

An autoethnographic vignette here may help to clarify its ramifications for non-seedbox users. One method I developed for participating in Jekyll's genre communities was to upload approximately fifty obscure 'free culture' releases relevant to the interests of the ambient music community. As described in Chapter 3, this process entailed acquiring a lossless copy of the release, transcoding it into MP3 formats, editing the metadata to conform to Jekyll guidelines, generating the torrent file for each of the four formats, and then uploading the torrents to the tracker. Within seconds of the tracker announcing the new upload, anywhere from three to ten seedbox accounts running an autodownloader script¹⁰⁷ connected to my BitTorrent client. Each snatched separate pieces of the torrent and exchanged the various pieces to each other. Later, other users who joined the swarm would default to downloading from the seedboxes, as their connection was faster than mine. This meant that the seedboxes within the swarm always obtained a higher percentage of upload credit than myself, despite the fact that I had performed the most important aspect of circulatory labour: formatting and contributing new music to the tracker.

The upshot is this: despite Jekyll's dependence on the circulatory labour of upload contributors for its very existence, the members who possessed the most advanced technical resources — i.e., seedboxes — acquired the majority of the torrent economy's rewards. This encroachment of economic capital into the domain of symbolic capital metered by the ratio system deftly shows how Jekyll represents a technological sociality,

¹⁰⁷ Autodownloader scripts are detectable by how quickly they are able to join the swarm. Seedboxes are identifiable through the BitTorrent client, as the IP addresses indicate the companies' data centers.

in that technological literacy and disposable income can be used to automate the acquisition of symbolic capital.

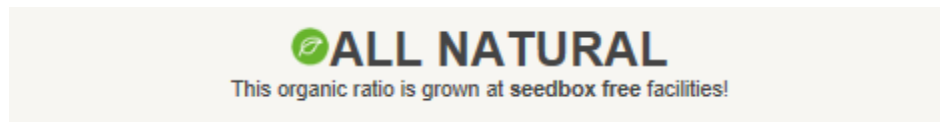


Figure 21. A representative example of a ‘seedbox free’ logo.

As a result of this dynamic, seedboxes usage on Jekyll is not without controversy. A contingent of loosely-assembled PU+ members, after years of ongoing debates about inequality in the ratio system intensified by seedboxes, began attaching tongue-in-cheek ‘all natural’ logos to their user profile pages, reproduced above. Drawing on the vocabulary and visual imagery of the organic food industry, this movement attempted to draw attention to the imbalance of circulatory labour performed by non-seedbox users, attempting to augment the prestige of their current position in the user class and ratio systems by highlighting their ‘natural’ accumulation of buffer. Other opponents of seedbox usage chose instead to continue to vocally protest these technologies. Two quotes from a disgruntled informant, VE, the first originally posted to a private tracker Reddit board, the second disclosed in a personal interview, encapsulate the primary points of contention from anti-seedbox proponents.

I really fail to understand this fucking private tracker-seedbox economy/philosophy that somehow became the norm within the torrent piracy world. *I mean the whole point of piracy is to get things effortlessly and for free*, but and now with those seedbox wars/competitions, especially in [Jekyll] where it's pretty much impossible to maintain a normal ratio without one, *it's becoming hopeless for people with [an] average inexpensive connection to survive in that environment*. [. . .] I can't be the only one thinking that spending money on piracy is just fucking absurd, am I not? Why the hell are those trackers not coming with some sensible bonus systems to support non-seedboxers and instead force this idiotic competition??

[. . .]

update 3: Uploaded 6 torrents today - got a seedboxer sitting on 5 of them already [robbing] me off my own uploads with his pay2win.

(VE 2014; emphasis added)

When you reward people for faster connections (especially when there's no need for it because torrents thrive on the multitude of users, not single users with high speed connection), and 'punish' those with slower connections even when they're potentially bringing more to the particular community - you're doing something wrong.

(VE Interview, 2016)

The strongly emotional tenor of these criticisms is an important and surprising finding. Aligning productively with the previous chapter's depiction of the moral economy of Jekyll, VE's critique of Jekyll administration is moral in nature. VE believes that the ratio system is unjust, arguing it should more strongly reward users who are 'bringing more to the particular community' through uploading new music. Despite this opposition, the majority of Jekyll users accept seedboxes, either having no strong opinions on them, broadly supporting their use, or personally renting one. The most common sentiment is that the presence of high-bandwidth peers within the swarms improves the overall quality of the tracker's technical infrastructure, and that Jekyll download speeds are consistently faster compared to public trackers.

To conclude, while members may deploy seedboxes both to accelerate advancement within the prestige economy and to circumvent the governmental norms of temperance, most participants believe their use offers a net benefit to the platform. This is despite evidence that seedbox usage contributes to an intensification of inequality and the hierarchization of socioeconomic status on Jekyll. Seedboxes are of particular importance to the theorization of circumvention, as this is the only circumvention technology permitted within Jekyll that appears to circumvent the values of its internal regulations. The ratio system instructs members on the importance of reciprocal contribution and helps to prevent overconsumption. However, siding with Jekyll's seedbox opponents, I contend that the short-term seeding strategies of autodoing scripts and seedboxes do not significantly strengthen Jekyll's torrent economy. Unlike the long-term seeding

described in Chapter 8 as an essential mode of circulatory maintenance, seedboxes' autosnatching strategies appear to appropriate much of the ratio credit from the original uploader, inserting themselves into swarms and accelerating overall speeds. In this way, the seedbox infrastructure recalls Marxist critiques of rent-seeking. Recalling Pasquinelli's critique of Google PageRank as a rentier intermediary whose only service is to provide 'the fastest diagram to access and measure the collective intelligence that has produced it' (2009, 10), the seedbox infrastructure parasitically and disproportionately reshapes the ratio system's economy in favour of its 'wealthiest' participants. One must conclude, then, that the values of Jekyll's technological sociality, along with its valorization of technical prowess, prioritize speed and infrastructure over notions of distributive justice.

Conclusion

In this chapter, I have considered how the design of music circulation technologies shape the practices of their participants by embodying distinctive forms of governance, through both top-down and bottom-up processes. Both Jekyll and Spotify privilege and encourage, or on the contrary discourage or restrict, particular circulation/consumption modalities. Trevor Pinch and Frank Trocco contend that 'technologies are never neutral' (Pinch and Trocco 2002: 309): they generate particular modes of engagement while being shaped by the cultural milieu from which they emerge. Jekyll in particular attempts to govern through both restrictive regulation and moral ideologies disseminated by its administration, with both being definitive of Jekyll's technical culture. The ethos of temperance demonstrates how the infrastructures and

technologies of circulation discipline subjects, inducing reciprocity as a moral and social norm. This leads to fellow members reinforcing governmental standards by way of ‘teaching’ new members proper modes of participation.

As I have shown, the techniques of governance within both platforms are complex and far-reaching. A charitable reading of Jekyll administrative direction suggests that its strict governance has not developed from authoritarian dispositions, but emerged out of a file-sharing genealogy of exclusivity and, ironically, of regulatory avoidance. This can be taken further, in that Jekyll’s administrative direction bears resemblance to ‘protectionist’ governance. By this, I mean to suggest that the governmental structures regulating Jekyll behaviour, particularly its limitations on VPN usage, are aimed at maintaining the current arrangement of the tracker and preventing regulatory interference. This protectionist direction is brought about by the precariousness of the extralegal circulation sphere and the fear of Jekyll’s eventual disruption.

Spotify in turn appears to invert many of these restrictive norms on music consumption, styling itself as a service offering ‘music for everyone’ and encouraging unlimited, ‘all you can eat’ musical listening via streaming of an expansive catalogue. However, as I have shown, the complex interaction of platform design, copyright licensing regulations, and anti-circumvention enforcement results in a series of blockages on circulation. This is particularly evident in Spotify’s governmental shaping of automated listening modalities like Fresh Finds, where musical choice and control are primarily handled by algorithmic recommendation systems. This move away from ‘lean-forward’ design, in which listeners actively choose and curate their own musical experiences, supports Chapter 7’s arguments regarding control and technical design.

This chapter has enriched the understanding of the systematic and evolving governance and design of technologies, in response to changing ideologies and uses, by those involved in their management. This level of analysis is informed by Madeleine Akrich (1992) on the projected users of technologies, as well as Steve Woolgar's work on 'configuring the user' (1990). The chapter has responded to the insights of Akrich and Woolgar, while extending their work in several ways. This is shown most dramatically in my formulation of circumvention as a dialectic of governance and resistance. The process is best exemplified by audio advertisements in Spotify. I showed how the platform governmentally induces users to listen to ads, and how individuals develop circumvention technologies that allow users to mute the advertisements. As Spotify modifies how its applications detects ad circumvention, older circumvention technologies no longer work, and new techniques must be developed in order for users to continue to mute advertisements. Likewise, the innovations of seedboxes that arose in response to governance by Jekyll's ratio system exemplifies this dialectic of governance and circumvention.

Taken in conjunction with earlier considerations of the socialities, exchange and labour practices of digital music circulation, I contend that music circulation systems present novel contributions to STS scholars interested in technical governance. For rather than static and closed 'technical objects', the focus of much of the earlier STS literature, Spotify and Jekyll are technologies characterised by their multiplicity, mutability and mobility: they continually evolve and expand through such processes as the dialectic of governance and resistance. This is exemplified by the hi-res audio debate within Jekyll. As new audio formats are popularised, Jekyll administrators and members engage in

lengthy discourse in order to reach consensus and protect the common good. In contrast, Spotify's lack of comparable discursive social spaces precludes these types of debates by design.

Through the ethnography of both technical design and actual use, I have been able to look deeply at the complexity of the relations between projected and actual uses, as exemplified in the dialectic of governance and circumvention. If the section on circumvention demonstrates how governance is resisted or subverted on both Spotify and Jekyll, this chapter also indicates how other domains of governance are generally complied with. For example, the complex rules governing contribution to the Jekyll tracker are strictly followed in actual use. This is perhaps because circumvention of these restrictions would negate the core tenets of Jekyll musical ideology, namely the collective concern with audio fidelity and 'quality'. Likewise, Spotify's governance of musical affinities through the automation of taste is mostly complied with. However, the example of MH and her friends following each others' Discover Weekly nuances this finding. Although these practices do not constitute a counter-practice, the social circulation of these playlists conflicts with Discover Weekly's design, intended as it is to foster an individuated mode of music consumption. Similarly, the general acceptance of automated governance through 'bots' in Jekyll IRC chat is nuanced by the MZ vignette, where circumvention of the bot's governing capabilities is intentionally performed in order to bring moderators' attention to a separate instance of rule infringement.

In the following, penultimate chapter, I pursue the thesis's concern with analysing actual user practices: I compare the diverging participant responses not to governance

through successful technical design, but to technical failure within both platforms,
showing how Jekyll communality engenders a resilience that is absent from Spotify.

Chapter Ten: Connection Maintenance: Downtime, Failure and Resilience

This brief chapter compares the collective responses to technical disruption within Spotify and Jekyll, offering insight as to how musically imagined communities maintain relationships when their conventional infrastructures fail. As I argued in Chapters 6 and 8, Jekyll communality emerges from the inalienable entanglements of shared musical affinities, music exchange, and collaborative labour. A prolonged period of the platform going offline, or ‘downtime’, necessitates a further nuance of this formulation of Jekyll sociality. This material demonstrates how the social formations of file-sharing are maintained when exchange relations are suddenly and unexpectedly severed. This chapter also brings Chapter 9’s theorization of circumvention into dialogue with this material, providing further evidence of how technologies are adapted in response to external threats. The ethnographic materials I gathered during a 3 month period of a ‘distributed denial-of-service’ (DDoS) attack shows Jekyll as a social formation of committed participants, exhibiting resilience in the face of adversity. The polymedia ecology described in Chapter 5 comes to the fore here, as the ‘alternative’ social spaces of Jekyll become the primary areas in which Jekyll sociality is enacted. This is contrasted with user perspectives of Spotify’s technical glitches, shortcomings, and failures. This chapter offers one of the starkest differences in comparative ethnographic analysis, capturing the irreducible significance of strong communal relations and a belief in a personal ‘investment’ in the platform, highlighted in moments of infrastructural issues. The contrasting responses of Jekyll and Spotify participants to glitches, disconnection, and

other disruptions of circulation are distinct, bringing to light Spotify users' fears and anxieties over the potential loss of 'ownership' of musical objects.

This examination of sociality and technological failure is heavily influenced by Brian Larkin's monograph on Nigerian media infrastructures, and how media circulation is marked by the presence of failure and infrastructural collapse. Larkin argues, 'The inability of technologies to perform the functions they were assigned must be subject to the same critical scrutiny as their achievements' (Larkin 2003, 218). Larkin documents a general sense of frustration when technologies do not afford the circulatory capabilities that are intended or expected, what he describes as the gaps between '*actual* and *potential* acceleration' (ibid., 235). Crucially, Larkin points to 'the rise of provisional and informal infrastructures' (here, the 'pirate' infrastructures of Kano, Nigeria) as the modes of actually existing circulation that require scholarly attention (ibid., 219). Likewise, Tom Boellstorff's consideration of 'lag' in virtual worlds as a 'sense of disrupture' is also informative in understanding the experience of digitality's failures (Boellstorff 2008, 102). If lag — the impairment or disruption of networked social experiences due to latency and other technological failures — can be said to 'represent a moment of breakdown demonstrating the cultural construction of time' (ibid., 106), then likewise, the downtimes of digital music circulation serve to remind participants of the contingent and transitory nature of these networked socialities. What both of these theorizations of technological disruption share is an emphasis on how commonplace and frequent these failures are. To reframe a turn of phrase from Francesca da Ramini and Jonathan Marshall (2014), the 'systemic disruption as everyday life' enacted on the cultural industries by global networks of file-sharing can be inverted to point to the informal and

contentious everyday experiences of file-sharing participants, who are routinely dealing with broken links, illegitimate files, and the disruption of circulatory access.¹⁰⁸

Jekyll and Downtime

Participation in Jekyll entails enduring frequent interruptions, errors and glitches. These disjunctures so clearly marked my early fieldwork encounters that I was initially unsure how to account for the presence of technological failure within circulation. Intermittent periods of downtime occurred throughout my fieldwork approximately once a month, including both scheduled site maintenance and unanticipated shutdowns. These periods of downtime lasted anywhere from an hour to several days, and included several different forms of failure. The most common issues related to the BitTorrent tracker itself, which went offline more often than the index, forums, or IRC server. As a result, several periods of ‘downtime’ only interfered with the formalized music exchange system, while the rest of the Jekyll ecology continued to function as usual. Jekyll participants were largely cognizant of the technical challenges of running a high-volume tracker and expected occasional interruptions. I only observed mild complaints about site stability during and after unscheduled downtime.

A significant period of downtime in 2014 led to new understandings of stability and the temporality of circulation within Jekyll, and also produced novel responses to external threats to the site. Beginning in late December 2013 and lasting through February 2014 (with intermittent moments of uptime as staff experimented with new

¹⁰⁸ It is not coincidence that these disruptions are often enacted by regulatory enforcement agencies of the cultural industries: perhaps this can be understood as ‘mutual systemic disruption’.

technical arrangements), Jekyll was forced completely offline by an innovative type of DDoS, known as an NTP Amplification attack¹⁰⁹. My initial judgment was that this attack would result in Jekyll's closure. Most file-sharing sites permanently shut down if offline for more than a month, as its users tend to quickly migrate to alternative extralegal platforms. Similarly, in my study of the private tracker scene, I found no examples of private trackers that had overcome long-term DDoS attacks. These months of downtime became the most formative fieldwork period for my understanding of Jekyll social cohesion. The collective response demonstrates a strong commitment to Jekyll communality, resisting closure, overcoming outside challenges, and reassembling its musical socialities. This illuminates the strength of participants' social connections and a collective commitment to preserving Jekyll's unique modes of digital music exchange. Besides donating to support Jekyll's new DDoS protection and mitigation package from web security provider Cloudflare, non-staff members were not able to assist in reopening the site.¹¹⁰ The technical labour of circumventing the DDoS was performed entirely by the site's highest-level administrators and laid entirely outside of Jekyll's normal participatory avenues.

For most members, the experience of downtime was initially characterized by uncertainty and confusion. The majority of Jekyll users were unaware at first that the tracker was being targeted by a DDoS attack, assuming the site was offline for technical

¹⁰⁹ NTP Amplification attacks target public Network Time Protocol (NTP) servers, using the MONLIST command to generate a data-intensive list of IP addresses, and spoofing the return IP address so that the MONLIST results are sent to the target of the DDoS. This means that a single 1Gbps connection can be amplified up to 200Gbps, giving attackers unprecedented resources for taking down internet resources (see Prince 2014).

¹¹⁰ I use the term 'resilience' instead of 'resistance' throughout to avoid association with the literature on subcultural resistance (see Hebdige 1979 for the archetypical example).

issues. On the third day of the attack, one of my informants texted me, asking me if I knew why the site was offline, and when it would be back up. Once the IRC server went offline, severing the central point of communication during site downtime, the site's most dedicated users realized that this period of downtime could be long-term. Recognizing that the attacker had significant resources and that the DDoS could last months, Jekyll members were committed to maintaining the collective.



Figure 22. A screenshot of Jekyll users discussing the downtime on Twitter.

Participants worked to reassemble and continue the sociomusical relations of the community on alternative media platforms, what one member called ‘Jekyll in exile’. While fewer members were involved in the ‘Jekyll in exile’ polymedia social spaces, the

levels of social discourse were even higher than during Jekyll's normal operation. Participants in this sense were resilient, inventively utilizing alternate IRC servers (the location of which were circulated informally through the community, primarily through Twitter and Facebook) and the private Facebook group to continue discussions. These included analyses of available courses of action, updates on the efforts to mitigate the DDoS attack, and most importantly, continuous exchange and discussion of music. Making use of Souseek, cyberlocker uploads and YouTube links to exchange music, 'Jekyll in exile' continued to exhibit the vibrancy of members' musical passions and affinities. Indeed, I found that the alternative IRC server was perhaps even more active than usual: despite having less members logged on at one time, Jekyll users coped with downtime by vigourously engaging in collective discourse and music exchange.

The level of resilience broadly mapped to the user's position within the Jekyll social hierarchy. Casual and low-level members were less likely to join the alternate IRC servers (often due to a lack of knowledge of the correct address), while staff, PU+ and highly active forum and IRC participants were the most active participants in the alternative social spaces. Returning to Larkin's 'provisional and informal infrastructures', Jekyll adapted itself in a similar manner. With imaginative and resourceful polymedia adaptations by its participants, Jekyll sociality maintained connections through provisional channels. After a long period of testing, Jekyll came fully back online in March 2014 with DDoS mitigation services in place, protecting the site, BitTorrent tracker and IRC server from all but the most advanced attacks. Within days, the alternative social spaces and file-sharing arrangements were suspended, but remained in place for use in future periods of downtime. The identity of the attacker was never

publicly confirmed, but widespread speculation within the private tracker community suggested that it was carried out by the owner of a rival private tracker. The possibility that the rival tracker would gain new members and increase profits, as this rival was widely known as a ‘pay to join’ tracker, is a plausible explanation.

Born’s four planes model of music’s social mediation (Born 2010, 2011) can help unpack Jekyll’s resilience. Where other accounts of musically imagined communities draw on affect theory (Straw 1991) or actor-network theory (Beekhuyzen 2010), Born’s analytic of mutually-dependent and intermediating planes of social mediation offers a rigorous framework for establishing how Jekyll continued to thrive despite precarity. A Latourian account of Jekyll and its prioritization of existing connections or associations might see extended periods of downtime as insurmountable, as the cessation of the enactment of association, and therefore its collapse (see Latour 1987, 2005). The attention to the specific temporalities of musical media in Born’s work is here of critical importance, in how media ‘interferes technically, conceptually, and aesthetically with the musical temporalities at issue’ (Born 2015, 380). Her conceptualization of conflicts and disjunctures in musical publics (see Born 2013, 34) points to how we might understand disrupted digital cultures. Jekyll’s resilience can be understood as the engagement of its multiple orders of social mediation. The microsocial relations formed through exchange (first plane) generate substantial dyadic social connections, which extend beyond the Jekyll ecology and into the broader lifeworlds of users, as many Jekyll members are friends ‘outside’ of the tracker. Furthermore, music exchange, curation and participation animates vibrant imagined communities (second plane), which are marked by the formation of shared social identities (third plane): namely, technologically-skilled

‘creative’ consumers, mostly well-educated middle-class white males, who eschew mass market music distribution systems for more rigorous and exacting forms of exchange. Lastly, Jekyll’s technical makeup belongs to the broader scenes and infrastructures of digital file-sharing (fourth plane), which have historically been subject to regulatory shutdowns and malicious hacking attacks; subsequently, file-sharing scenes have come to anticipate periodic challenges to circulation and have informally established alternative social spaces, largely due to the instability of file-sharing social platforms.

Jekyll’s continued existence is attributable to the strength and depth of its socialities. This includes the dyadic connections Jekyll’s most dedicated users have made with each other and a sense of ‘responsibility’ to their imagined communities. Importantly, Jekyll’s resilience is largely due to the investment of labour in its many collaborative projects, which has created rich infrastructures for classifying, organizing, and exchanging music. The magnitude of labour invested in the tracker by staff and users alike intensifies the impulse to preserve existing arrangements. Jekyll’s hierarchies through the ratio and user class systems generate symbolic capital and prestige that are irretrievably lost without the tracker. In order to maintain these social positions, the tracker first had to come back online, in spite of the significant challenges it faced. The downtime period demonstrated how contingent and transitory Jekyll is to its participants. Notably, this inherent instability strengthens Chapter 8’s formulation of circulatory maintenance. Extralegal circulation’s inherent precarity means that its participants are continually striving to save the assemblage from obsolescence, abandonment, and failure.

The response to downtime bears resemblance to the history of Jekyll following OiNK’s closure by the BPI and IFPI in 2007. Jekyll’s earliest forum and blog posts

consist of participant remembrances of and personal responses to the shutdown, most notably including Jekyll's founder, JM. His post history reveals that he began working on starting up a new tracker, which became Jekyll, within several days of OiNK's shutdown. As JM was a highly active OiNK member and saw that it would be unable to reopen, he quickly began contacting OiNK members to form a staff so as to begin to reassemble the approximately 200,000 torrents held by the tracker. This remarkably swift creation of a 'replacement' OiNK¹¹¹ can be likened to broader descriptions of the file-sharing scene, where 'the obstinate resurgence of piracy displays qualities most Hydra-like' (Iyengar 2009, 87). The Hydra metaphor may be apt in certain ways, but it fails to capture how the underlying social relations and labour are rapidly transplanted and reassembled within these new platforms, which is to say that Jekyll at its inception was not wholly 'new' (as argued in Chapter 4). This genealogy of resilience in the wake of OiNK's termination is thus clearly evident in the Jekyll's social response to the DDoS downtime, revealing a hitherto unobserved ethos within the community: how private tracker sociality is marked by the anticipation of failure. Rather than complaining or seeking out new modes of music consumption, most Jekyll users I spoke said they actually expected tracker downtime, with one informant, SP, expressing surprise that the tracker actually existed at all eight years after its inception. While Jekyll itself would eventually be shut down, its participants uniformly expected its socialities to mutate, relocate, and continue their circulatory projects elsewhere.

¹¹¹ Jekyll is not the only major music tracker to have been founded in the aftermath of OiNK: the second largest private tracker dedicated to music (FW) was also founded at this time, and was also assembled by former OiNK users. FW was differentiated by its technical infrastructure: while Jekyll decided to radically change the private tracker frontend and backend technologies, FW more closely imitated the 'look and feel' of OiNK.

Spotify and Failure

Spotify, despite its substantial investments in streaming architectures, also experienced moments of interruption and downtime. However, technical failures for Spotify users inspired strongly different reactions. During my fieldwork observation period, Spotify system-wide downtimes were infrequent, and the few instances of widespread outages were reportedly resolved quickly: I was unable to document any instances of downtime on my personal account. Nevertheless, examples of technical failure were observed, including glitches within the application itself (e.g. crashes, freezes, and ‘lag’), as well as individual releases within the Spotify library becoming temporarily inaccessible due to database failures. Spotify’s customer support forums hosted hundreds of thousands of posts requesting help with malfunctions or reporting various software bugs and issues. Additionally, users frequently reported music removed by rightsholders from the service as a technical error, viewing ‘missing music’ as a technical glitch for Spotify to rectify.

More provocatively, my informants much more frequently characterized their overall perspective on Spotify on the basis of the service’s shortcomings: its ‘slow’ or ‘bloated’ applications; the frequent instability and unreliability of cross-platform integration utility ‘Connect’; the desktop application’s lackluster performance as a ‘local file’ (i.e., the user’s imported MP3 collection) media manager; and its inadequate features for musical discourse. Despite being trivially simple to register and use Spotify compared to Jekyll, and eliciting significantly less labour, Spotify users were less likely to express satisfaction with the platform’s affordances of new music consumption practices, and

much more likely to focus on negative experiences with often minor or secondary features of the platform. I note this recurring negativity because of the intensity of vitriol surprised me at times, as in the case of my most dissatisfied informant, AN. He regularly contributed to threads in the support forums that focused on Spotify's shortcomings, with titles such as 'Thanks for ruining my day, Spotify!' and 'Overall Spotify is terrible'. In an interview with AN, he explained that his frustrations with Spotify did not come from an immediate emotional response to technical interruptions of music consumption, but from a perceived lack of appropriate customer service to bug reports and feature requests:

I wasn't always the raving madman you see peppering the forums with vitriol daily [...] I'm the kind of person that doesn't care about anything, generally. If I go to a restaurant and I ask for mustard on a sandwich instead of mayonnaise, but they give me mayo, I'll just eat it, no complaints. That's an honest mistake, there's no ill intent. [but] I was paying for a service for nearly a year that frustrated me every single time I used it on mobile and my frustration was that [customer service] could only say "we'll pass this on to the developers" for 8 months.

AN Interview, 2014

Others did not necessarily target the company's supposed unresponsiveness in their explanation of their dissatisfaction, but rather noted the gaps between their anticipated functionality/stability and their actual experience as a subscriber and participant. Downtime in particular brings out some of the most direct and acrimonious language for disconnected users, as has been observed elsewhere (see Russell 2016). Ann Werner's autoethnographic account of mobile Spotify use is vividly described in terms of interruptions, frustration, and anger at the platform, focused particularly on its shortcomings and the need to adapt personal practices:

Mobile music streaming created emotions of anger in me when the search for music to listen to took up time. [. . .] This anger, felt less intensely as frustration, was due to my own failure to manage the technology [. . .] also, sometimes the apps did not function at

all. [. . .] As such *the anger felt in the failed space of music listening contained other possible futures* [. . .]

Werner 2015, 209; emphasis added

My primary interest in this dissatisfaction is to unpack the dramatic difference between Jekyll and Spotify users' response to technical failure. To begin, studies of consumer satisfaction offer some insight. The seminal study of perceived quality, expectation and performance (Olshavsky and Miller 1972) found that consumers rate products more in line with *expected* quality than on objective evaluation. Later studies nuanced this position by noting that 'delivering quality service means conforming to customer expectations on a *consistent* basis' (Lewis and Booms 1983, 100; emphasis in original). This 'disconfirmation model' provides a more dynamic model than Olshavsky and Miller's for understanding dissatisfaction as a reaction to the disruption of initial expectations (Churchill and Suprenaut 1982; see also Parasuraman et. al 1985). Based on this literature, one might anticipate that anger for discontented Spotify users comes about from the service's disconfirmation of their expectations derived from Spotify's marketing rhetoric, such as 'the right music for every mood and moment'. Spotify users expect the service to always provide music on demand. Jekyll users, on the other hand, do not expect constant uptime, and therefore experience little disconfirmation.

While this formulation is somewhat useful, here I advance my own understanding, one that includes some of the most momentous differences between Spotify, Jekyll, and their very different elicitations of participant loyalty. This draws on my core arguments about Jekyll: its strictly governed and rigorous barriers to entry; its rationalisation and balancing of reciprocity; its elicitation of extensive forms of user labour; and the governmental shaping of participation. All of these characteristics, as

onerous and restrictive as they may seem, generate what I would describe as ‘investment’. This can be understood as member loyalty, in which participants feel commitment to the web of relations, obligations, and affective alliances within the Jekyll ecology. Importantly, in Jekyll, these relations, obligations and affective alliances are social in nature, and therefore give forms of pleasure and solidarity. While Jekyll may be at times exclusionary, competitive, or otherwise restrictive, these features come to strengthen loyalty. The depiction of the interview process as an initiation rite in Chapter 3 aligns with this finding, showing that the perceived exclusivity and difficulty of Jekyll instructs new members in the desirability of membership. Downtime represented the most formidable challenge to the collective social, musical and affective investments garnered from years of participation. Due to the scale and scope of the DDOS attack, responses to it drew on existing collective resilience, while the experience also magnified this collective resilience.

Spotify user investment and its subsequent loyalty stand in stark contrast. As described in Chapter 8, while Spotify elicits significant user labour through ‘the work of being watched’ (Andrejevic 2000), the end products of this data mining are alienated from the participant. The symbolic capital of being a Spotify ‘tastemaker’ is largely meaningless to most subscribers, and users have no direct access to or control over their own listening data, which in total comprises Spotify’s most significant assets. As described in Chapter 7, Spotify’s social design is that of a ‘second-tier’ SNS, primarily oriented around integration into the broader online and offline lifeworlds and social networks of its participants, as opposed to encouraging the development of a self-contained and rich social ecology. As described in Chapter 7, this reorientation away

from dyadic exchanges (e.g.. following friends, meeting others, ‘sharing’ songs, collaboratively curating playlists) and move towards individuated experiences obviates the social nature of music circulation, which sustains platforms such as Jekyll. Put simply, Spotify’s socialities merely color the listening experiences of its subscribers, whereas in Jekyll, sociomusical participation is necessary for the continuation of circulation. The sociomusical practices of Jekyll reflect both the first and second planes of Born’s theory of music’s social mediations: first, the microsocialities of exchange and synchronous discourse practices; second, the musically imagined communities among its participants. Both of these planes are necessary for the continuation of circulation, and thus, for the tracker’s very existence. This affective connection to Jekyll generates a sensibility of shared ‘ownership’ of the tracker for PU+ members, in which lies the most coherent explanation of the community’s long-term resilience. Conversely, the lack of user control over Spotify ‘collections’, and a subsequent lack of tangible investment, results in a striking lack of loyalty or patience in the face of trivial problems and more major difficulties with the platform.

Material differences in the technical modes of circulation and consumption of Jekyll and Spotify are also of importance. When Jekyll is offline, users are severed from acquiring or contributing new music to the tracker, but still possess their own personal music collection. However, no such access is available to Spotify users, and their personal library vanishes when offline.¹¹² This is symptomatic of what Eric Harvey calls the ‘new anxieties’ of streaming (Harvey 2014). The loss of ownership (even if that ownership was always tenuous and subject to copyright restriction) over personal music

¹¹² The exception to this point is Spotify’s ‘Offline Mode’. Premium subscribers can select individual playlists and albums to be cached for ‘offline’ use for 30 days.

collections is felt even more acutely when infrastructural failures remind individuals of the impermanence of their collection.

Conclusion

This chapter has examined how users of both platforms respond to instances of technical failure. In one of the strongest comparative differences, I have found that most Jekyll participants exhibit a stronger sense of loyalty and investment in the platform, which I have described as ‘communal resilience’. Despite — or perhaps because of — its complex and onerous regulations and the collective moral obligations they elicit, Jekyll members feel a closer sense of affiliation to the platform. The reasons for this include Jekyll’s noncommercial, user-generated catalogue, its elaborate and inventive technical achievements, and vast stores of collaboratively curated musical selections. Above all else, Jekyll generates collective resilience through sociomusical practices: the four planes of Born’s model— microsocial relations, musically imagined communities, musically-inflected identity formation, and infrastructural support — are each exhibited in Jekyll downtime. Looking at participants’ differing responses to technical disruption, we see how Jekyll’s participants relate to the tracker in several different ways. For some, Jekyll is a space for communality, in that it brings together groupings of individuals who relate to their fellow members as constitutive of a community; for others, it is an extralegal resource for mere consumption, without engagement in social spaces and or reciprocal contribution; and for still more, a hybrid, wherein circulation is sometimes attended to economically, other times in the pursuit of prestige, and yet other times in pursuit of communal belonging. The resilience exhibited by the PU+ classes during downtime

exemplifies this finding. The members who are most invested in the accumulation of symbolic capital and ascension in Jekyll's social hierarchy are precisely those who continued to participate in the alternative social spaces during downtime. In contrast, the casual members who use Jekyll simply to obtain music largely abandon Jekyll during downtime.

Spotify's ersatz and simulated socialities, in comparison, do not generate such enduring connections. As Spotify's socialities are limited and primarily dyadic, there is little opportunity for its users to 'reconvene' in alternative social media platforms during Spotify downtime. Spotify users' intolerance of technical failure within Spotify shows how Spotify is most often understood as being merely a technical infrastructure for music consumption. Larkin's analysis of infrastructural failure generating a gap between 'actual and potential acceleration' (2003, 235) is apposite in understanding why Spotify technical failures lead to surprisingly intense emotional reactions. Moreover, the material conditions of music consumption on Spotify intensify the impact of technical failures. Spotify users cannot access their music collections during Spotify downtime, in contrast to Jekyll downtime, which severs circulatory connections but does not affect personally held music collections.

Chapter 11: Conclusion

This thesis has ethnographically portrayed two preeminent contemporary platforms of digital music circulation and consumption, with analytical attention focusing on the following primary themes: the nature of music circulation and consumption; the distinctive online socialities formed through participation; the governance of musical practices through technical design, and the responses of actual users; and the immense labour elicited in the support of these platforms, which I have termed ‘circulatory maintenance’. In this Conclusion, I first consider these primary themes comparatively, showing how my findings can only be understood in light of the comparative insights offered by my fieldwork in Spotify and Jekyll. Next, I return to the Foucauldian historical approach of Chapter 4, showing how the licensed and unlicensed spheres, exemplified by Spotify and Jekyll, mutually mediate the other. Finally, I conclude with a consideration of the futures of digital music circulation and consumption. Through the detailed examination of digital music’s regimes of governance, we can productively imagine alternative arrangements, ones in which emergent modes of production, consumption, and circulation are encouraged instead of curtailed. I examine the trajectory of both platforms, observing that both administrative visions suggest a further intensification of current arrangements. I posit that circulatory labour will continue to represent the primary driver of curation on both licensed and extralegal platforms, as technologically-mediated individuated experiences must still rely on tastemakers to locate recommendations. Most importantly, the entanglement of music and the social means that audiences will continue to form affective alliances through music circulation and consumption, regardless of the ‘social’ affordances of new technical platforms.

In both platforms, the circulation and consumption of music have become increasingly linked to each other, but the differing articulation of their interrelations on Spotify and Jekyll represents one of the strongest points of comparison. As described in Chapter 8, the Jekyll ratio system's formalisation of informal music exchange practices has led to a highly complex and onerous system of prescribed reciprocity. One of the most surprising findings of this research, as shown in Chapters 3 and 9, is that Jekyll participants often download music they do not intend to listen to. Releases are strategically downloaded solely for the purposes of recirculating data and acquiring buffer. In contrast, Spotify's instrumentalisation of user data draws together circulation, consumption and listening to an unprecedented extent in the history of digital music circulation, as shown in Chapter 7. The personal listening selections of Spotify users are both broadcast to their Facebook-integrated social networks as well as incorporated into Spotify's algorithmically-generated music recommendation services. Individuals' Spotify curation and consumption practices become immanently linked to music's circulation through these instrumentalisations. If, for Steve Jones (2000), 'movement' is the defining characteristic of digital music technologies, calling for further analysis of 'how people get to music and [...] how music gets to people' (ibid., 229), then music on Spotify is constantly in motion. In response to the literature on circulation, in which production, distribution and consumption are said to merge into indistinguishable flows of cultural forms (Straw 2010), this thesis uses comparative analysis to show how circulation and consumption are interrelated but embody different modes of relating to musical objects. The ratio system may shape how and why music is circulated, but it does not fully configure the diverse and rich musical affinities of Jekyll participants. Similarly, while

data from Spotify user listening sessions is (unwittingly) appropriated for circulatory purposes, this process is ‘blackboxed’, occurring in a domain separate from individual moments of music listening. The affective responses to streaming music and music obtained from private trackers are not reducible to networked cultural flows.

The socialities engendered by music exchange, curation, recommendation, and discourse are a central motivation for participating in both Jekyll and Spotify. In Jekyll, one of the most striking findings of this thesis is the scale of its complex and nested social relations. The overarching sense of connection and obligation to other participants, particularly as seen in the genre communities of Chapter 6 and the experience of downtime in Chapter 10, but also evident in the materials presented in Chapters 5, 8 and 9, lead to broader sensibilities of belonging within the platform. Despite the onerous and rationalized design of Jekyll, the thesis shows how shared musical affinities engender collective social relations that come to characterise the nature of Jekyll sociality. In contrast, nothing like these forms of sociality are found in Spotify, due to the ersatz nature of its social design. As I showed in Chapter 7, the socialities generated by Spotify are relatively limited, consisting mainly of chains of dyadic exchanges as well as the public playlist system. The lack of social spaces dedicated to musical discourse, compared with the rich polymedia ecology of Jekyll highlighted in Chapter 5, severely restricts the types of musical sociality that are able to form within Spotify. The thesis suggests that much of the difference between Jekyll and Spotify can be attributed to the musical collectives that have been afforded in Jekyll and purposefully curtailed within Spotify.

The techniques by which Jekyll and Spotify both govern their users is another key locus of comparison. While all technologies embody projected users in particular ways, this thesis shows how governance over musical practices characterises both platforms to a surprising extent. As described in Chapters 3, 5 and 9, the extent to which discourse is moderated within Jekyll demonstrates the extent of Jekyll's control over permissible approaches to participation. The strict regulation of participation leads to the formation of counterpublics, as shown in Chapter 5, and the development of circumvention technologies, analysed in Chapter 9. Similarly, musical objects themselves are strictly governed on Jekyll, through the exacting standards for audio fidelity and music contribution considered in Chapter 9. Above all else, Jekyll's onerous regulations show how it intentionally moulds projected users towards the creation of a technical culture that valorises high quality audio and exclusivity. In comparison, Spotify's governance of user practice is less conspicuous, taking the primary form of technical design without overt rules. As shown in Chapter 7, Spotify's focus on designing individuated experiences has led to the embodiment of projected use, excluding alternative modes of music consumption, collection and circulation. Going beyond Akrich, Chapter 9's study of both projected and actual use shows how compliance with governance occurs on a spectrum: some regulations are largely complied with, while others are widely circumvented, and still more are only partially resisted.

Circulatory maintenance, introduced in Chapters 8 and 10, is the final key locus of comparison between Spotify and Jekyll. The immense amount of user labour necessary to maintain the continued operations of both platforms is one of the strongest findings of the thesis, shown particularly in Chapter 8, but also in Chapters 6, 9, and 10. Jekyll

exemplifies the need for participants to materially support the infrastructures of circulation within the BitTorrent tracker itself, as Jekyll's music catalogue would disappear without commitments to long-term seeding by its participants. Likewise, the collaborative editing projects described in Chapter 6 show how Jekyll participants maintain the tracker's 'high quality' standards for metadata and genre classification. In comparison, Spotify's enrolment of user labour for first-line customer service on the Spotify Community forums takes a different approach to circulatory maintenance. Much in the same way that Spotify's public playlist system engenders a largely ersatz form of sociality as analysed in Chapter 7, the Spotify Community simulates internet forum cultures, such as Jekyll's, in order to offer a simulation of the experience of peer-to-peer internet cultures and also to reduce the number of customer service agents employed by the company. Unlike in Jekyll, where both participant and administrative labour is solely performed by volunteers, the Spotify Community forums displace paid employment. Using its own customers to perform technical support for each other is Spotify's primary technique of circulatory maintenance. Spotify would be negatively impacted if its most dedicated users no longer provided the company with extensive amounts of free labour. Likewise, much of the platform's ability to encourage participation depends on its simulation of peer-to-peer internet cultures. This emergent form of circulatory maintenance elicited by Spotify is perhaps the strongest area in which its rentier musical capitalism is demonstrated.

Music's 'platform capitalism' (Srnicsek 2016) is also of primary importance, with attention to the forms of work performed and instrumentalised by artists, audiences, and intermediaries. The analysis of labour dynamics shows how platforms are constructed

and constituted, and also interrogates the beneficiaries of the products of labour. Circulatory labour is in part curatorial work, by way of creating playlists, collages, and other containers of musical recommendation; equally, circulatory maintenance requires work to perpetuate existing arrangements, as in the case of seeding torrents and providing technical assistance to others. With the rise of algorithmic techniques in music platforms, participation itself becomes circulatory labour, by way of the ‘work of being watched’ (Andrejevic 2002), providing data for recommendation systems and ‘lean-back’ music listening functions. Finally, attention to the genealogies of music circulation, as in Chapter 4, shows how new technologies and modalities are in dialogue with both legal and extralegal spheres. Genealogical analysis demonstrates the historicity of contemporary trends, and offers a method for tracing both the origins of particular sociotechnical arrangements and potential alternatives that have been disregarded.

By way of concluding, I want first to continue this historical theme by considering the mutually entangled histories of Jekyll and Spotify, and then, finally, to consider the potential futures of digital music circulation bequeathed by the two platforms. These two sections, taken together, help to show how music consumption and circulation have been configured on both platforms, and provide further clarity as to how Jekyll and Spotify came to take the shape that they did.

The Mutual Mediation of Licensed and Unlicensed Exchange

‘[N]ew markets, technologies and ideas only ever emerge in relation to existing commercial and social practices. The digital economy is incapable of being its own separate sphere, despite how [differently] digital goods appear to act’

Morris 2010, 43

In this section, I want to return to my analysis of Jekyll and Spotify's intertwined genealogies from Chapter 4, bringing the thesis' contributions to economic anthropology to bear on claims of their mutual mediation. Much of the existing literature on online music circulation portrays its licenced and unlicensed spheres as pure, bounded and opposed (Cammaerts 2011b; da Rimini 2013; Kernfeld 2011). On the basis of my work on the modes of exchange animating Jekyll and Spotify, I contest this analysis, arguing that licensed and unlicensed domains of online music circulation are better understood as hybrid and as evolving in counterpoint.¹¹³ On the one hand, the informal sphere—in the guise of unlicensed, extralegal systems of music exchange—is largely dependent on the recorded music industries to supply the musical objects that enter into circulation, resulting in 'an ambiguous position that is both inside and outside market economies' (Sterne 2012; 224). On the other hand, the formal market constituted by commercial music platforms invariably seeks to appropriate the informal participatory practices of P2P cultures as it pursues enhanced modes of audience engagement that transcend earlier distribution channels. In these and other ways, I suggest, both extralegal sites like Jekyll and commercial platforms like Spotify are engaged in mutual mediation: in their technical architectures, forms of exchange, socialities and labour practices, each draws on characteristic aspects of the other. However, as argued in Chapter 4, this mutual mediation is not limited to the hybrid nature of the present platforms; rather, it can be

¹¹³ In a symptomatic report measuring Spotify adoption and its effects on file-sharing behavior, Spotify Director of Economics Will Page argues that unlicensed exchange networks represent their primary competitors and barrier to market penetration. Nonetheless, the influence of unlicensed file-sharing is apparent even in his opening statement: 'when Spotify was founded in 2006, one of the original goals was to *beat piracy at its own game*' (Page 2013; 2; emphasis added).

traced back genealogically to their precursors, demonstrating the interrelated historicity of legal and extralegal spheres of music exchange.¹¹⁴

Perhaps the most striking evidence that Jekyll's architecture incorporates historical influences from the formal music economy lies in its orientation to exchange. As I showed earlier, Jekyll's ratio system—with its elaborate market-like equivalences and its systematization of reciprocities—and the requests forum—both a marketplace with currency-like mechanisms and an aspirational forum for collective action to enhance the musical commons—offer compelling proof of the mutual mediation of the licensed and unlicensed spheres. Indeed, Jekyll's ratio system is significantly influenced by a market logic characteristic of the commercial music industries. Specifically, the fact that the ratio system evolved in reaction to the perception of a 'free rider' problem—the systematic non-reciprocity manifest in earlier unlicensed file-sharing platforms—is evidence of an implicit acceptance on the part of Jekyll's governmental regime of the 'tragedy of the commons'. That is to say, an ersatz currency was introduced to remedy the pitfalls of communal exchange. As multiple cross-cultural works of economic anthropology have demonstrated, however, the 'tragedy of the commons' is neither universal nor inevitable: not only are the 'commons' defined and enacted differently in diverse property rights regimes, but non-privatized and communal approaches to ownership can prove to be effective ways of managing resources (Feeny et al. 1990; Hann 1998; McCay and Acheson 1987). Indeed, the ratio system's calculus of contributions conflicts strongly with the reciprocal ethics and dynamics of classic gift exchange—what Sahlins memorably describes as 'the toleration of material unbalance

¹¹⁴ See also Coleman 2013 on the interrelations between the Free and Open Source Software (F/OSS) movement and commercial software industries.

and the leeway of delay' (Sahlins 1973: 193). The previously described 'ratio watch' period, for example, is a strikingly rationalized and inflexible interval of reckoning, one that is incompatible with the temporalities of generalized reciprocity.

Acknowledging the historical dimension of the emergence of Jekyll's coercive reciprocity is another key move in discerning the influence of the formal market. It points in turn to the need to once again trace the genealogies of file-sharing. By adopting a Foucauldian orientation, I note first that BitTorrent's rise to ubiquity cannot be explained as a result of its technological superiority. Rather, it emerged as a temporally-situated response to the social, economic and legal conditions then widely faced by file-sharers. It is symptomatic in this regard that informants mentioned that they did not share back their downloaded files on Napster-like P2P networks (and later on public BitTorrent trackers such as The Pirate Bay) because they believed they were less likely to be detected by regulatory agencies if they removed their files from P2P availability right after completing a download. The 'free rider' problem did not arise, then, as a result of antisocial acts or technical limitations on bandwidth, but due to the perceived need to avoid the risks of prosecution for copyright infringement. In this sense, it was the punitive actions of the RIAA, IFPI and other recording industry agencies that directly shaped the contours of Jekyll's ratio enforcement scheme.¹¹⁵

More generally, the very software architecture of the BitTorrent protocol that underlies Jekyll speaks to the path-dependent historical array of technical influences it

¹¹⁵ As a corollary, the extent to which users are willing to seed on Jekyll so as to fulfill its ratio requirements is largely dependent on their belief that copyright enforcement representatives have not yet penetrated such private trackers. As one informant explained, if he believed Jekyll to be compromised in this way, he would simply migrate to another tracker, abandoning his Jekyll account along with his significant economic and affective investments in it.

has accrued from the formal digital economy. In particular, the architecture of distributed computing on which Jekyll has been built was initially pioneered in the formal economy and predates the extralegal spheres that grew around BitTorrent and its immediate predecessors. Notably, the now-defunct Swarmcast protocol, which preceded BitTorrent, was released in 2001 for the licensed distribution of large files and marketed as a potential bandwidth-saving solution for digital media corporations. Swarmcast developed several of the core distributed computing techniques that would later be popularized by BitTorrent, including that of splitting files into hundreds of small pieces, as well as the terminology of ‘swarms’ that came to define the networked public taking part in P2P exchanges (Koman 2001). In turn the design of Swarmcast, along with that of file-sharing services such as Gnutella and Napster, was influenced by several contemporaneous commercial software packages, including the anti-censorship P2P platform Freenet, as well as the P2P webcast streaming service Allcast (Dougherty et al. 2001). Indeed, decentralized data transmission is itself traceable to the founding ethos of the internet (ibid.: 7).

These genealogies suggest that the migration of file-sharing music subcultures from radically public P2P networks—requiring only a personal computer, an internet connection and freely available software—to closely-governed, highly exacting private unlicensed online formations like Jekyll cannot be understood as a response wholly preconditioned by BitTorrent itself. This migration is not a necessary evolution in the teleological expansion of file-sharing technologies, but a response to a profusion of contradictory socio-technical tendencies, ideologies and relations. The influence of the music industries on Jekyll is visible not only in its response to the imperative to evade

copyright infringement penalties, but in the platform's mutation of the key principle underpinning the industrialization of music: that the very proliferation and dispersal of music carries costs and necessitates intensive governance. Emphatically, the spectres of music's industrialization and its commodity forms—from its paratexts to its ideologies of personal ownership—pervade and mediate even informal and unlicensed spheres of digital music exchange. Ultimately, generative as the socio-technical architecture of Jekyll may be, it does not represent some kind of terminal fulfilment of extralegal forces, but embodies just one tributary in the unceasingly inventive, continually-furcating flows of digital music exchange.

Conversely, for Spotify, it is important to ask: to what extent is this commercial platform configured by the spectral presence of unlicensed music exchange?¹¹⁶ Certainly, the music industry has tended to respond to the incursions of unlicensed file-sharing services by attempting to absorb them. But my ethnography suggests that Spotify is mediated by unlicensed file-sharing practices in multiple ways, with widespread ramifications across its royalty-generating operations. A first manifestation of the influence of informal P2P exchange systems, and particularly private BitTorrent trackers, was in Spotify's technical design in its initial period, 2007 to 2014, which instrumentalised the technical resources of consumers themselves in an arrangement new to commercial music distribution. Specifically, the Spotify client was designed—like that

¹¹⁶ Andrew Leyshon has noted the profound impact of digital exchange technologies on the music industries, documenting the disruption of their established business practices (Leyshon 2003). He argues that Napster's transformation into a licensed subscription service represented an appropriation 'of the distributive capacity of Napster to ends that will nevertheless protect the income of copyright capitalism' (Leyshon 2003; 549). Likewise, Patrick Burkart and Tom McCourt contend that 'what [the Big Four major music labels] cannot control [they] must co-opt' (Burkart and McCourt 2006; 44).

of earlier BitTorrent systems such as Jekyll—as a centrally governed P2P network, in this way massively reducing the scale of servers required in order to provide on-demand streaming to millions of subscribers (Kreitz and Niemela 2010).¹¹⁷ Moreover, while Spotify is technically classified as a streaming service, the Spotify client utilizes a percentage of each user’s free disk space temporarily so as to store streamed files for future listening: a practice referred to as ‘caching’.¹¹⁸ Because of the technical innovation of distributing the cache’s contents to nearby peers on demand, an innovation directly derived from the unlicensed BitTorrent model, Spotify required much less central bandwidth than earlier centralised client-server architectures; indeed, the Spotify server was technically parasitic on the P2P network of its subscribers, as well as on individual users’ own storage capacities. Not only the technical design but the terminology is derivative: the server-side software which confirms Spotify membership and monitors consumption is called a ‘tracker’. While Spotify’s technical genealogy has been traced by Kreitz and Niemela (2010) back to public, decentralized P2P systems, my contention is that private trackers like Jekyll fit the genealogy even more closely, such that Jekyll and Spotify can be seen to draw on interrelated histories in the construction of strikingly different circulation models.

¹¹⁷ It must be noted, however, that Spotify began discontinuing its P2P technical infrastructure in 2014; this move, which renders this architecture obsolete, only more strongly illustrates Spotify’s strategic instrumentalisation of P2P orientations at the time of fieldwork, along with its lack of affective investments in the ethos of P2P exchange.

¹¹⁸ A technical explanation follows: when a user attempts to play a song not yet cached, the client contacts the central data center, requests the first 15 seconds of the song, along with the location of peers on the Spotify network who possess the full track in their cache, and begins downloading it from the most ideal peer, resulting in playback that begins in c. 250 ms. This model requires much less central bandwidth than traditional client-server architectures, with only 8.8% of total data transmitted coming directly from Spotify during one measurement (Kreitz and Niemela 2010).

The Futures of Music Circulation

While the previous section revisited Spotify and Jekyll's historical interrelations, I want to conclude by considering the trajectories of licensed music streaming and extralegal private BitTorrent music trackers, and the potential futures envisaged by both platforms. This compellingly brings out the primary themes of my thesis, particularly the further entanglement of music circulation with its consumption and the continued governance of music circulation by musical technologies . Lastly, I conclude by reemphasizing music's uniquely rich capacity for engendering socialities, and argue that the future of digital music circulation will continue to depend heavily on participatory cultures.

In a question and answer session conducted by a Jekyll member in 2015, one of the tracker's senior administrators (BZ) was asked about the future of Jekyll in an evolving digital music ecology:

Q: Do you see streaming services as a greater threat to [Jekyll] than, for example, any sort of legal action?

A: I'm not sure how strange this sounds, but I actually do in some respects. If you presume that [Jekyll] will be around forever, then streaming services do pose some long-term threats to our success. With the advance of streaming services, much of the music we track that may actually inspire legal action (popular stuff that gets leaked early), is already available for free. That we carry it in FLAC probably won't be much of an aggravating factor. Consequently, streaming services may help us by alleviating some of the legal heat (we blend in among services providing free content), but also gradually erode some of our user base. I don't foresee any streaming services stealing away many of our core users, though. The ones who seed constantly and upload new content are deeply entrenched in this lifestyle.

BZ 2015

Several months later, Spotify CEO Daniel Ek was asked a similar question about the future of Spotify:

We really want to soundtrack every moment of your life. So what excites us [is] when we are able to do that in moments, which may seem counterintuitive at first. Take sleep as an example. Millions of people every day (or night!) now go to sleep listening to Spotify. This is a behavior that is brand new for a huge chunk of that same audience. So as we think about Spotify in the future, it's really all about bringing music (and other media) to more moments in your life. In order to do that, we need better recommendations, better partnerships and the right content for those moments.

Ek 2016

These statements can be understood as representative of the trajectories of both platforms. The private tracker sphere's continued existence will depend on its intensification as a niche circulation modality for highly specialized audiences: archivists, collectors, audiophiles, and participants dedicated to Jekyll's communality. This further reliance on a core grouping of members is in part a response to—and simultaneously accelerating—the decline of Jekyll's prominence within the extralegal sphere since 2015. BZ's suggestion that less dedicated members might migrate elsewhere in the digital music ecology emphasizes Jekyll's position as the 'connoisseur' platform, an alternative to mainstream modes of music consumption.

Furthermore, as mentioned in the thesis introduction, Jekyll has been permanently shut down. In November 2016, several Jekyll servers leased from French hosting company OVH were seized by French law enforcement officials, following a multi-year investigation into online file-sharing by the Société des Auteurs, Compositeurs et Éditeurs de Musique (SACEM). Although these servers did not hold the tracker's private data — particularly the databases of user profiles and histories of torrent activity — the likelihood of further legal action resulted in the Jekyll administrators immediately shutting down the site, the BitTorrent tracker, and the IRC channel. This was followed by Jekyll's official Twitter account announcing that Jekyll would not return in any fashion. Former members of Jekyll, recalling the 'communal resilience' I described in Chapter 10,

immediately regrouped on public IRC channels, Reddit, and the private Facebook group. In each social space, users shared details about the shutdown, expressed sorrow over the site's shutdown, and speculated about the future of the Jekyll sociality. After the permanence of Jekyll's shutdown was confirmed — as many suspected that Jekyll administrators intended to reopen a much more exclusive and secretive tracker — former members launched several competing Jekyll replacement trackers, operating exclusively on Jekyll's source code. After initial startup challenges, two of these trackers are fully functioning. One so closely imitates Jekyll in its demographics, ethos, design, and governance that it appears identical, except that it hosts a maximum of 20,000 users instead of 200,000.

This rupture of Jekyll sociality, in which former members migrate to new private trackers, licensed streaming services, and alternative modes of extralegal circulation precisely mirrors the demise of OiNk detailed in Chapter 4. Jekyll and its primary private tracker competitor both originally aimed to become the 'replacement OiNk'. Later, Jekyll came to develop new norms, technical designs, and social practices, diverging from OiNk and formulating its own socialities. It is probable that Jekyll's genealogical progeny will similarly mutate, discarding particular elements of Jekyll and incorporating new technologies and values. It seems most likely, however, that these changes will generate a further intensification of Jekyll's orientation towards specialization and exclusivity, due to the increasingly subcultural status of BitTorrent trackers online. It appears that music consumption on Jekyll's ancestors will be entangled even further with its circulation, due to the increasingly governed nature of these platforms. When Jekyll was shut down, the tracker contained over three million torrents, which were uploaded over the course of the

site's seven-year existence. As of October 2017, the largest of Jekyll's replacements, RD, already contained 1.1 million torrents, with only 27,000 registered members, compared to 150,000 Jekyll members at its peak in 2015. This disparity in the proportion of uploaders per members suggests that RD will elicit an even more onerous degree of circulatory maintenance and contributory labour from its participants than Jekyll.

At the same time, Spotify is almost unrecognizable from its initial formulation. With its original goal of providing, 'all the world's music instantly', Spotify was first and foremost an expansive and unprecedented catalogue of accessible music, primarily navigated by search, and organized through personal playlists—an iteration of the recurring industry imagination of a 'celestial jukebox' (Burkart and McCourt 2005). This was subsequently reconfigured, designing sociality inherently into the consumption experience. Facebook friends' current music selection was displayed concurrently within users' personal listening session, and new music discovery was encouraged through the sharing of songs and playlists with acquaintances and the publication of personal playlists into the Spotify searchable index. I have argued that this shift towards the instrumentalisation of social relations was effectively a simulation of the more naturally unfolding socialities of informal digital music communities, appropriating the sociotechnical affordances of peer-to-peer architectures for a conventional artist-audience mode of distribution. Now, as described in Chapter 7, Spotify's focus on further expanding algorithmic systems for delivering individuated experience leads to a lessening of explicit social interactions — e.g., recommending a song to a friend — towards tacit sociality, in which users are aware that musical experiences are shaped by sociotechnical assemblages, codifying relationships and expressing them in a manner outside of more

conventional interpersonal or communal terms. This goal is to further push Spotify's context-dependent recommendations into listening modalities even more intensively integrated into everyday life. As originally explicated in Paul Lamere's 'Zero UI' project, Spotify's trajectory is aimed towards a fully 'lean back' format, stemming listener choice as much as possible (Lamere 2014). This approach reflects Spotify's movement away from attracting 'early adopters', a market segment presumed to be fully captured, and towards more mainstream target markets. Lamere titles these mainstream consumers 'Indifferents' and 'Casuals', who comprise over 70% of the digital music market. He argues that more casual listeners are uninterested in 'control', and that the need for 'interaction' (e.g., searching for new music, curating playlists) must be kept to a minimum to retain these audiences. In order to minimize interactions, Spotify is in the vanguard of exploring these 'branded musical experiences', such as the future 'Sleep Mode' envisioned by Ek above (Morris and Powers 2015, 2).

This trajectory is oriented at a return to the centrally-controlled musical experiences offered by terrestrial radio, but individuated for each listener. However, this business model is only new in the particularities and intensities of its implementations. Branded music experiences are key to the emergence of the 20th century music industry, and contextually-appropriate curated playlists are inescapably the purview of radio. Indeed, Ariana M. Freire's (2008) prescient comparison of radio and the then-nascent streaming industry still reflects Spotify's current orientation towards 'radioness'. Her criteria, including limits on interactivity and programming 'authentic' listening sessions for functionalist listening situations, powerfully recalls some of Spotify's most characteristic traits. I contend that streaming's debts to 'radioness' are likely to become

only more apparent in the future, pulling further away from ideas of ‘ownership’ and shaping music consumption fully around branded partnerships and contextually-appropriate musical ‘moments’.

Spotify and Jekyll thus exemplify the trajectory of the licensed and unlicensed spheres. The explosive growth of subscription-based and advertisement-supported streaming have substantially impacted extralegal file-sharing, physical music distribution, and paid digital downloads, accelerating the existing transformations away from unsegmented mass market offerings (e.g., Napster, HMV, and iTunes) towards more specialized modes of consumption. This includes the renewed interest in vinyl records as well as independent distributors such as Bandcamp that simultaneously offer both digital download and streaming modes. However, the extralegal sphere in the United States and Western Europe has witnessed the most dramatic shift towards specialization. As the 2015 IFPI Digital Music Report acknowledges, extralegal file-sharing is ‘fracturing’ but is far from gone. The contingency and variability of what defines ‘piracy’ is even addressed in its focus on the ‘value gap’ between the music industry’s realized profits and the value extracted from digital music by content providers such as YouTube (IFPI 2015). This is echoed by numerous mainstream artists who have spoken out against licensed streaming services as a force for ‘piracy’ and the ‘devaluation’ of music (see Swift 2014). The retreat into niche specialization by Jekyll’s progeny reflects the broader extralegal sphere’s fragmentation. Much in the way the notorious illicit darknet market The Silk Road was dismantled and replaced by dozens of smaller sites (see Van Buskirk et. al 2014), most prominent BitTorrent trackers such as The Pirate Bay have been shut down, regionally blocked, or otherwise reduced in influence. File-sharing is now adrift in

a virtual sea of extralegal ripping apps, ‘safe harbour’ sites¹¹⁹, cyberlockers, mixtape hosts, anonymization networks, and protocols for circulating digital content, with no single method dominating the file-sharing scene in the manner Napster and BitTorrent did between 1999 and 2012.

Ultimately, the discussion of trajectories and digital music’s futures are at least somewhat marked by teleological imaginations of technological evolution, with assumptions that the existing arrangements will be replaced by the introduction of as-yet-unknown technologies. These supposed future technologies are often assumed to intensify or ameliorate aspects of digital music circulation currently within widespread debate (e.g., ‘more personalization’, ‘more comprehensive catalogues’, ‘fairer compensation to artists’). An expectation of constant ‘disruption’ and systemic revolution in digital cultures is akin to what Jody Berland describes as ‘the managerial imperative of constant technological updating’ (Berland 2009, 297). Music technologies are perhaps less subservient to the product cycles and planned obsolescence of the hi-tech sector than other cultural technologies, but nonetheless are marked by consumer expectations of groundbreaking change. ‘What’s next?’ is a constant refrain from cultural commentators of digital music economies, who have become accustomed to frequent rises and falls in music consumption platforms within the post-Napster era. While subscription-based streaming and ‘private’ BitTorrent trackers surely do not represent digital music’s ‘end of history’, neither does not necessarily follow that they are due to be fully replaced by

¹¹⁹ Here I refer to mainstream content hosts such as Dailymotion and YouTube, which are characterized in the 2015 IFPI Digital Music Report as ‘safe harbour’ sites due to their business model’s reliance on ‘safe harbour’ laws for passive hosts of content. The IFPI holds that content hosts such as these generate significant profit from copyright infringement, and indeed, ‘play an active role in distributing, promoting and monetising content’ (IFPI 2015, 23).

‘better’ or more efficient modes of consumption. A media archaeological perspective of digital music’s fractured and intertwining lineages demonstrates that the values, affordances and cultural imaginaries of defunct technologies mediate newer technical forms, and that putatively dead technologies are often still vibrantly alive and present long after their supposed deaths.

Looking at Jekyll and Spotify’s futures, one cannot imagine a future for the digital music ecology that completely occludes the affordances of the so-called ‘participatory turn’. While the web is perhaps trending towards ever more proprietary, privatized, and rationalized arrangements, music’s potential for the animation of social relations is too prescient to be abandoned. Social relations formed through music exchange will continue to exist long after the current arrangements of the contemporary music industries; individuals’ desire to create, curate, and circulate digital music objects socially will certainly outlast Spotify and Jekyll. The ersatz nature of much of the so-called ‘Social Web’ (i.e., those internet-based services which instrumentalize social networks to produce value) must be recognized, and alternatives that afford genuine relationships will inevitably prove to be more resilient, as shown in Chapter 10. If Akrich and Woolgar show us that all technology configures its users in certain ways, projecting particular uses, nonetheless, the degree of closure can range on a spectrum. It is possible for the design of new music circulation and consumption technologies to avoid the exacting demands of Jekyll as well as the rentier appropriations of Spotify. The necessity for open, emergent and mutable platforms for digital music practices is essential for enriching music’s future, echoing Adam Harper’s (2011) call for fuller, de-professionalized modes of musical participation. This requires recognizing audiences as active participants in the

co-creation of digital music ecosystems, beyond Jekyll's onerous restrictions and Spotify's instrumentalisation of its users as decollectivized sources of listening and curation data.

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Appendix A: Glossary

Bounty: The total amount of upload credit awarded to the uploader of a requested release.

Buffer: The surplus amount of data that a user can download or spend, also called ‘upload’ or ‘upload credit’. The term buffer is more commonly used by power users and above as they accumulate large amount of uploaded content. Buffers can be as large as multiple terabytes.

Client: A program that enables P2P sharing using the BitTorrent protocol. μ Torrent, Deluge and Transmission are the most popular clients on Jekyll.

Freeleech: A reconfiguration of the ratio system for specific torrents, in which seeding is calculated as usual, but leeching costs are not counted. Freeleech is used by staff to highlight a particular releases, reward specific members with the power to choose the next freeleech release, or to celebrate significant events in the tracker’s history. Freeleech torrents are typically snatched tens of thousands of times, generating sizeable buffers for those who participate.

Leech: The users in a swarm who are receiving copies of a file – also used in verb form (leeching) as a synonym for ‘downloading’ a torrent.

Lossless/Lossy: Lossless formats compress data without affecting the audio content of the original source. This is contrasted with ‘lossy’ audio formats that compress data by dropping certain portions of audio content.

Piece: Files are divided into hundreds of small pieces by the uploading BitTorrent client when the .torrent file is created for the purposes of P2P efficiency. A user snatching a heavily-seeded torrent often connects to dozens of seeders, each of which shares pieces individually.

PU+: Any site participant whose user class is Power User or above, used emically to refer to senior members of the site.

Ratio: The numerical value relative to a user’s total uploaded data divided by downloaded data. In order to maintain ‘leeching privileges’, or the ability for a user’s BitTorrent client to connect to the swarm and obtain data, the ratio value must be higher than the required ratio.

Ratio Watch: If a user’s ratio falls below their required ratio (after the 5 GB grace period), they enter a two-week warning period called ratio watch, during which the user must raise their ratio above the required ratio to avoid disabled leeching privileges. Users who download more than 10 GB while on ratio watch are automatically disabled, a common occurrence, as users will decide to snatch as much music as they can before abandoning their accounts. If the two-week ratio watch period ends without the user

raising their ratio adequately, the account loses leeching privileges but remains active. Privileges can be restored by uploading new albums and filling requests, though most users who lose leeching privileges are eventually disabled for inactivity.

Required Ratio: The calculus that determines whether a member can download new releases, expressed as a ratio of downloaded data versus uploaded data. There is no required ratio while a user has downloaded less than 5 GB, and after 5 GB, ratio requirements gradually increase. The maximum tier is 100+ GB downloaded, which requires a ratio of .6. If a user continually seeds all of his/her snatched and uploaded torrents, required ratio is decreased, incentivizing long-term seeding. If a user seeds all of their files long-term, they are said to be 'seeding 100%' or 'fully seeded'.

Seeds: The users in a swarm who are making available copies of a release, also used in verb form (seeding).

Snatch: A term used to indicate a completed download through BitTorrent.

Swarm: The collective of all clients seeding and leeching a particular torrent.

Tracker: The server that tracks which seeds and leeches are in a swarm. Private trackers can refuse connections to clients that attempt to connect if they are not properly authorized or if their account is not permitted to share. Trackers do not host the shared content, nor do connections directly route through them: they only point to the location of seeders. Private trackers are still P2P in this regard, though they are more centrally managed than almost all other P2P protocols.

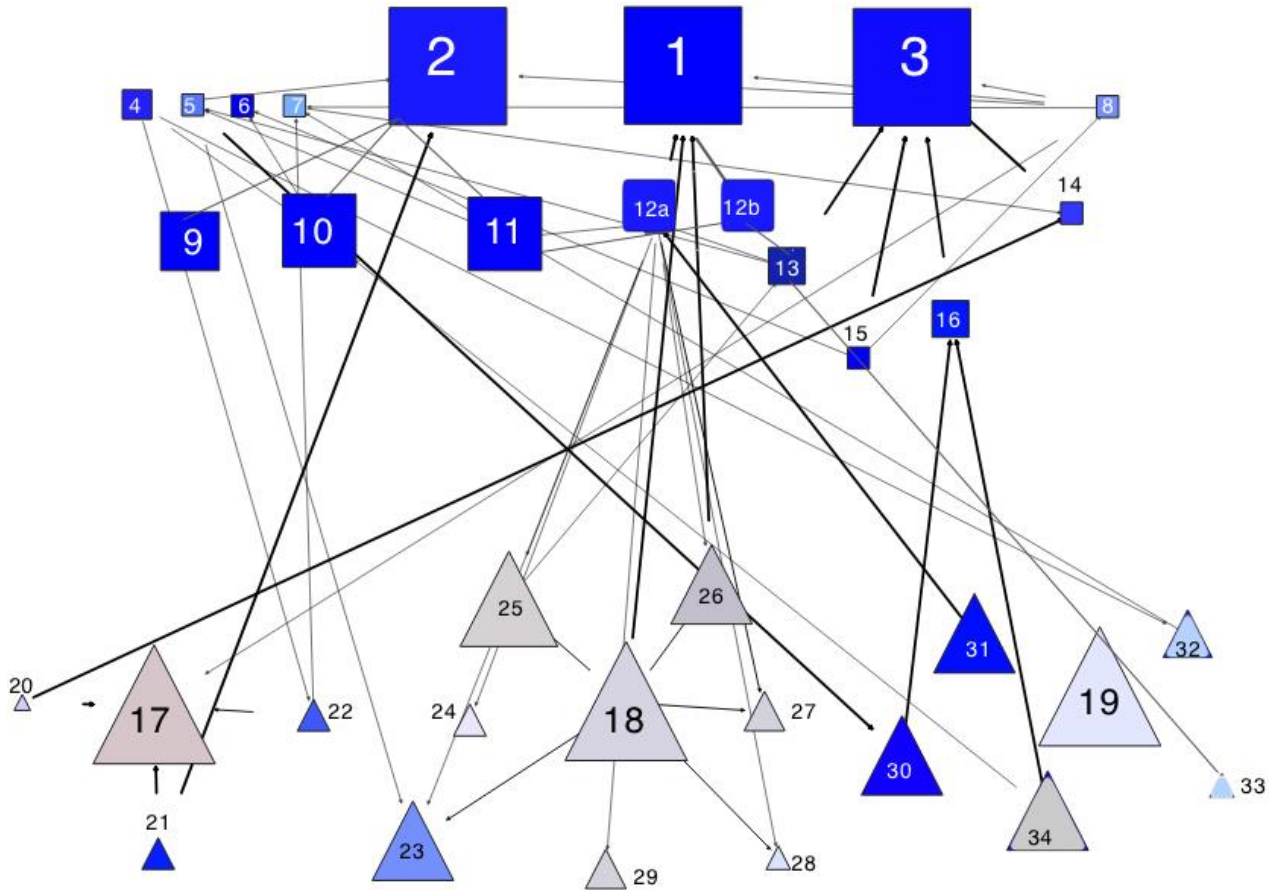
Upload: The word has multiple meanings on the site. The three most common usages:

1. The process of categorizing, tagging, and submitting metadata to the site in order to inform the tracker that new content is available from a client ('I just uploaded the new Destroyer album').
2. The upstream bandwidth available to the user through their ISP ('my upload is 100Mbps').
3. The total lifetime amount of data seeded as displayed on the user profile page (My upload is at least 500GB).

'Seeding' and 'uploading' are distinguished as such: 'uploading' is the process of contributing new releases to a tracker, whereas seeding is maintaining the availability of a torrent to leeches in a torrent.

User Class System: The hierarchical system, based on performance in the ratio system, which enables new features and permissions for participants, and carries significant prestige. The user classes are User, Member, Power User (PU), Elite, Torrent Master (TM), Power TM, Elite TM, VIP, Legend, Forum Moderators, Staff, and Administrator. User classes above Elite TM are not based on ratio statistics, but are awarded at the discretion of Administrators.

Appendix B: Visualization of Jekyll Ecology



Legend:

Squares represent Jekyll-hosted social spaces, triangles represent resources involved in Jekyll ecology hosted externally. Size of shape indicates everyday importance and activity in Jekyll sociality. Hue signifies the proportion of communal participation in forming the resource: dark blue signifies highly-engaged participatory practices, light blue signifies less social importance, and gray indicates a resource important to the Jekyll ecology, but formed and maintained by third parties.

1. Torrents/Index
2. Forums
3. IRC
4. Staff Announcement Pages
5. User Profiles
6. Wiki
7. Interview Prep Site
8. Rules
9. User Class-Restricted Forums (“PU+”)
10. General Forums
11. Music Discussion Forums
- 12a. Requests
- 12b. Collages
13. Communities of Practice Channels
14. Interview Channel
15. Help Channels
16. General Chat Channels
17. Private Tracker Scene
18. Licensed Distribution – Sources of Digital Music
19. Social Media Networks
20. User Profiles on Non-Jekyll Trackers
21. Private Tracker Subreddit
22. Discogs
23. iTunes
24. Spotify
25. Licensed Physical Media (i.e., Vinyl, CD, Tape)
26. Bandcamp
27. Hi-Res Audio Distributors (i.e., HDTracks)
28. Beatport
29. Last.FM
30. Facebook Private Group
31. Twitter
32. Turntable.FM (defunct)
33. YouTube
34. Private Tracker Invite Thread

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