# “Now Playing. You”:
# Big Data and the Production of Music Streaming Space.

**by**

**Robert Prey**

M.A. (Communication), Simon Fraser University, 2005
B.A., University of Windsor, 2001

Dissertation Submitted in Partial Fulfillment of the
Requirements for the Degree of
Doctor of Philosophy

in the
School of Communication
Faculty of Communication, Art, and Technology



**SIMON FRASER UNIVERSITY**

**Fall 2015**

# Approval

**Name:** **Robert Prey**

**Degree:** **Doctor of Philosophy (Communication)**

**Title:** ***"Now Playing. You":***
***Big Data and the Production of Music Streaming Space.***

**Examining Committee:** **Chair:** Robert Hackett
Professor

**Yuezhi Zhao**
Senior Supervisor
Professor _____

**Rick Gruneau**
Supervisor
Professor _____

**Enda Brophy**
Supervisor
Assistant Professor _____

**Andrew Feenberg**
Internal Examiner
Professor _____

**Mark Andrejevic**
External Examiner
Associate Professor
Media Studies
Pomona College _____

Date Defended/Approved: Nov 3, 2015 _____

## Ethics Statement


The author, whose name appears on the title page of this work, has obtained, for the research described in this work, either:

a. human research ethics approval from the Simon Fraser University Office of Research Ethics,

or

b. advance approval of the animal care protocol from the University Animal Care Committee of Simon Fraser University;

or has conducted the research

c. as a co-investigator, collaborator or research assistant in a research project approved in advance,

or

d. as a member of a course approved in advance for minimal risk human research, by the Office of Research Ethics.

A copy of the approval letter has been filed at the Theses Office of the University Library at the time of submission of this thesis or project.

The original application for approval and letter of approval are filed with the relevant offices. Inquiries may be directed to those authorities.

Simon Fraser University Library
Burnaby, British Columbia, Canada

update Spring 2010

**Abstract**

This dissertation begins from the premise that Dallas Smythe's attempt to develop a Marxist 'materialist' political economy of media remains a critically important - and unfinished - project. To-date, the debate has largely been concerned with locating the central commodity produced by ad-supported media. This commodity has been at various times identified as either 'audiences', 'watching-time', 'ratings', and more recently, 'prosumers' or 'data'.

Building from the late philosopher Henri Lefebvre's insight that Marxists have too often focused on the production of commodities *in* capitalist space, leaving them blind to the production *of* capitalist space itself, this dissertation proposes a different approach. Ad-supported media, I argue, generate rents from the spaces that are produced by media audiences/users around media content. The question of how 'media space' is produced and shaped by the stipulations of rent extraction is examined through a case study of the ad-supported music streaming sector. From terrestrial radio to P2P file sharing, music has long facilitated the production of mediated "social space". Contemporary music streaming services such as Spotify, SoundCloud and Pandora Internet Radio, represent the latest attempt to transform the spaces of listeners into spaces of capital: what Lefebvre referred to as "abstract space".

This dissertation investigates the *perceived*, *conceived*, and *lived* dimensions of the struggle to produce abstract space on music streaming platforms. In particular, the role played by data mining and analysis, as typified by the music intelligence company The Echo Nest, is examined. I argue that the drive to increase advertising revenues leads to the further segmentation and ordering of listeners and content, as sociability is turned upon itself to fulfill the dictates of capital. While social space is never entirely dissolved, abstract space increasingly shapes the potentialities of social space, as our examination of SoundCloud demonstrates.

In short, this dissertation develops an alternative materialist political economy of media that shifts focus from the production of commodities to the production of spaces. Music streaming services provide a window into the dynamic and unstable process through which mediated social space is made abstract in the commercial media economy.

**Keywords:** audience commodity; labour; rent; value; abstract space; social space; music streaming.

## Table of Contents

## Introduction

One of the central disputes of the infamous cultural studies versus political economy debates of the 1990s was about how to best conceptualize the 'audience' (see Ferguson and Golding 1997; Garnham 1995, 1998; Grossberg 1995, 1998). Just as the dust had settled on this debate, the emergence of interactive "web 2.0" and participatory "new media" appeared at first to signal that proponents of "the active audience" had won the day. In line with popular discourse, academic scholarship became almost giddy in its celebration of the libratory, creative, and participatory dimensions of the digital transformation.

In recent years, this celebration has been tempered by the realization that perhaps there is another side to this story. From Twitter comments to Facebook 'likes', we are all increasingly leaving behind digital footprints as we interact with new media. Indeed, the massive provision, storage and evaluation of personal data, with the goal, as Mark Andrejevic (2011, 615) puts it, "to craft an interactive mediascape that triples as entertainment, advertising and probe", underlies web 2.0 business models.

Data mining through interactive practices associated with new media have first, and foremost, caused widespread concern about personal privacy. Significant academic work has warned against threats encompassed by digital surveillance (Campbell and Carlson, 2002; Gandy, 1993, 1996; Lyon, 2001; Whitaker, 1999). Many of these critics draw from Foucault (1977) who invoked the 18$^{th}$ century Panopticon as a model for control in contemporary societies.

A more recent development is the recognition by political economists of communication (ie. Andrejevic 2002, 2007, 2013; Fuchs 2012) that surveillance and feedback mechanisms should not *only* be understood through the "invasion of privacy" perspective. There are several reasons why privacy may not be the best hook to hang one's critical hat on. First, privacy is an inherently relative and culturally-specific concept. What is meant by 'privacy' not only varies widely *across* cultures but its meaning is also continuously undergoing transformation *within* cultures. What is more, new media companies have become increasingly adept at responding to privacy concerns; both through public relations but also more substantially by "hashing" their databases—turning names, addresses and other personally identifiable data into long strings of numbers.

In turn, there is a strong argument to be made that surveillance is driven not so much by the desire for control, but rather by the dictates of capital. As a Forbes article on tracking technology put it: "[i]t may raise hackles to think that U.S. intelligence officials might be monitoring your telephone and Internet communications, but for most of us it's only the marketers who are really interested in our everyday online activities" (Tanner, 2013). In short, the active audience is also active for capital. Andrew Ross (2009) has put it best: "[t]hose of us who were weaned on Media Studies' classic eulogies…[of] the concept of an active media audience…might be forgiven for mouthing 'watch what you wish for'". Intensive monitoring and surveillance systems mean that consumption, whatever else it may also be about, is at its core, about production.

All of a sudden we have reason again to dust off and read anew some of the most important statements that have been made about the relationship between production and consumption. I am thinking here of the introduction to *Grundrisse* where Marx (1973, 90) writes "[c]onsumption is also immediately production, just as in nature the consumption of the elements and chemical substances is the production of the plant." We can also include Foucault's insistence that Panopticism be understood as productive, and of course, Dallas Smythe's theory of the 'audience commodity'. In fact, Smythe's work has seen a resurgence of interest in recent years (see Andrejevic 2002; Cohen 2008; Kang and McAllister 2011; Caraway 2011; Lee 2011; Fuchs 2010, 2012, 2014). The popularity of social media has made Smythe's arguments appear to be even more suggestive today, in particular his claim that leisure under capitalism be seen as productive of value.

At the same time, communication scholars have increasingly turned to the theoretical tradition of autonomist Marxism in order to frame media consumption as an instance of 'free', exploited, 'immaterial labour' (ie. Lazzarato 1996; Terranova 2000). Distinctions aside (see Chapter 1), critical media scholars who draw on both autonomist Marxism and the "audience commodity" traditions share a common purpose: to apply Marxian concepts of value and exploitation beyond the wage-labour relation. Driving such pursuits is a desire to expand the definition of who is exploited and therefore, who can be a considered a 'worker' and thus a potential ally in the struggle to transcend capitalism. The question of whether this desire is actually analytically or politically sound lies at the heart of the present work.

This dissertation begins from the premise that Smythe's attempt to develop a Marxist 'materialist' theory of the media remains a critically important, and unfinished, project. In the opening sentence of the classic essay that launched the so-called 'Blindspot Debate', Smythe (1977, 1) wrote: "[t]he argument presented here…is an attempt to start a debate, not to conclude one". In this spirit, I begin with a critique of the terms and assumptions of the original "the audience commodity" debate and its more recent formulations. This is a friendly critique, conducted from the basis of Marxist value theory, with the aim to strengthen Marxian analyses of media and communication. Such an analysis will demonstrate the inherent weaknesses of both the "audience commodity" thesis and its successors (ie. Fuchs 2010; 2012; 2014). It will be demonstrated that instead of audiences/users producing surplus value, media capitalists extract rent from advertisers (see also Caraway 2011; Huws 2014). In turn, Marx's theory of rent will be developed and shown to be more revealing of the relationship between media companies, audiences, and advertisers than a materialist analysis that focuses on audience/user 'labour'.

As Edward Comor (2015, 18) writes "(m)aintaining the precision and consistency of Marx's categories is crucial if we are to accurately use or test his theory." The perspective put forth here is also, I argue, more in keeping with Marx's method. This is because those who argue that media audiences and 'prosumers' produce surplus value, apply Marxist categories of labour, surplus value, and exploitation to one part of the overall capitalist economy - the media sector. In doing so, media-capital is artificially isolated from capital-in-general. The strength and brilliance of Marx's analysis of

capitalism, however, begins from his insistence on studying capital in general - capital in the abstract - as it moved through its necessary circuits. To develop a materialist theory of the media we need to locate media within the overall circuit of capital. Once we do, it becomes clear that ad-supported commercial media are central to the *realization* of surplus value within the wider capitalist economy.

Of course, the argument that commercial media facilitate value-realization rather than value-production has generated much opposition amongst critical political economists (ie. Smythe 1977; Gandy 1993; Schiller 2007; Fuchs 2014). One of Smythe's primary targets was Baran and Sweezy's classic account in *Monopoly Capital* (1966) of the "sales effort". As a critical part of this sales effort, advertising was considered an 'unproductive' expense of circulation. Smythe argued that this was exemplary of the 'idealist' approach he was critiquing, as it focused solely on media's role in convincing people to consume commodities produced elsewhere in the economy.

Instead, Smythe (1977, 2) asked: "what is the commodity form of mass-produced, advertiser-supported communications?" To-date, the attempt to develop a 'materialist' political economy of communication, as an alternative to dominant 'idealist' critiques, has been absorbed by debate over whether this 'commodity' can best be conceived of as 'audiences' (Smythe 1977), 'watching-time' (Jhally and Livant 1986), 'ratings' (Meehan 1984), or more recently, 'prosumers' and 'data' (Fuchs 2012, 2014 ).

The argument made in this dissertation is that media *do* produce more than ideology[1], but this does not necessarily mean that what they produce is a commodity (in the Marxist sense of the term). A materialist analysis of the media that recognizes the central role of rent provides us with a clue to solving the mystery of what it is exactly that media, and their audiences, produce. I argue that what media and audiences produce is what advertisers rent access to: *media space*.

In short, instead of a focus on the commodity produced and sold by the media, I attempt to shift attention to the *spaces* that media produce and extract rent from. Here I follow the Marxist philosopher Henri Lefebvre's argument that capitalism is not just about the production of things *in* space but perhaps even more importantly, capitalism is about *the production of space itself*.[2] The political economy of communication has shared with most Marxist critiques a fascination with things produced *in* space. So-called 'idealists' see the communication commodity as "messages", "information", "images" etc., while 'materialists' have instead offered 'audiences', 'ratings', 'data' etc. In the process, the surreptitious production of media space itself has been ignored.

How to best conceive of such 'media space' is a problem I deal with in some detail. In his works on space Henri Lefebvre focused on capitalism's relationship to urban

[1] However, I see no reason to reject the study of media ideology as an important, and complementary, critical approach.

[2] "When the forces of production make a leap forward, but the capitalist relations of production remain intact" Lefebvre (1991, 62) argued, "the production of space itself replaces - or, rather, is superimposed upon — the production of things in space." This would appear to be the case today with the centrality of knowledge and internet for wealth creation.

space and the built environment. Nevertheless, I will argue that Lefebvre's theoretical model is flexible enough to account for digital media spaces. This is because Lefebvre posits space not as a fixed entity, but as a dynamic set of relations that is actively produced.[3] Lefebvre insisted on examining the political economy of space and what he called the "*explosion of spaces*" (1979, 290) precipitated by capitalism. I argue that we can describe the emergence of the Internet as a contemporary, 'virtual', manifestation of this "explosion of spaces"

While geographical space – in particular the relationship between media and the spatial phenomena of globalization – has been the focus of significant attention in the political economy of communication (ie. Innis 1950, 1964; Mattelart 2000; Mosco 2009), this tradition has generally not understood media to constitute a spatial form *per se*. When the spatiality of media *has* been foregrounded in communication and cultural studies (ie. Meyrowitz, 1985), there has been little attempt to understand 'media-as-space' as central to the political economy of media. The argument put forth here is that by better understanding the production of media space we gain insight into the political economy of media. How 'media space' is produced in the first place, and how rent shapes the production of such spaces, are questions that dominate the second half of this dissertation. The argument that rent rather than surplus value production explains the

[3] Following Leibniz, Lefebvre (1991, 8) argues "...a space is not a thing but rather a set of relations between things [objects and products]." As well, like Heidegger, Lefebvre argues that "space does not exist in any such absolute, a priori form; it is not something that human activity fills up, but rather something that human activity produces" [Cohen, 2007, 232].

political economy of ad-supported media is thus not a conclusion but a starting point from which to develop an alternative materialist theory of the media.

**Case Study: Music Streaming Services**

As a case study, this dissertation will examine ad-supported music streaming services as new 'spaces' of music consumption. Music streaming services are currently transforming how music is being distributed and consumed, making massive music libraries available from any web–enabled device. Taken together, on-demand music streaming services such as Spotify, Rdio, Soundcloud and Deezer, and personalized Internet radio services like Pandora and iTunes Radio, are the fastest-growing sector of the global music industry and represent the future of music distribution and consumption in a post-download era (IFPI, 2014).

The shift to streaming can be seen as an attempt to regain control of digital music, which was lost in the post-Napster file-sharing era. Music in an era of digital reproduction and internet has become a value-less knowledge commodity. While the iTunes Store and similar online retail outlets proved successful for a time, download sales have declined in recent years. The recording industry has largely conceded that if music can no longer be exchanged as a commodity, then the focus should shift towards commodifying the very spaces of music consumption.[4] In this sense, we can think of the

[4] The three major labels each own between 2 percent and 6 percent in Spotify (Greeley, 2011).

arrival of licensed music streaming platforms as an attempt to regain control of digital music, which was lost post-Napster.[5] Streaming services create institutionally effective listeners (Ettema and Whitney, 1994): effective in the sense that they can be integrated into the economics of the recording industry.[6] In short, music streaming services epitomize the capitalist solution to the problem of digital music as an infinitely reproducible public good.[7]

Much of the discussion about streaming services thus far has centered on whether their payouts to artists are fair and sustainable in the long term.[8] This is a critically important topic, but one which this dissertation will largely side-step. In what follows, I employ the streaming sector as a case study through which to explore the relevance of the so-called 'audience commodity' thesis in the new media era. This is because music streaming services provide us with a very interesting case through which to examine this debate anew. Such services exhibit characteristics common to both mass and social media forms. Some of these services – such as Berlin-based SoundCloud, commonly referred to

[5] Eric Harvey (2014), for example, explains that the music industries investments in streaming "is designed in large part to wrench back control via unlimited access after a decade of ceding power to mp3-downloading fans."

[6] According to Spotify, over 70 percent of the service's total revenue is passed on to record labels as royalty payments (Spotify, n.d). A recent study by Ernst & Young and the French recorded music trade body SNEP (whose members include Universal Music, Sony Music and Warner Music) found that record labels keep 73 percent of payouts from streaming services. The remaining revenue is shared by writers/publishers who receive 16%, and then artists (mostly paid by their labels), who get 11 percent (Ingham, 2015).

[7] In economics, 'public goods' are goods that are both non-excludable and non-rivalrous, meaning that individuals cannot be excluded from consuming them and their consumption does not reduce their availability. Fresh air and education are common examples given in micro-economics textbooks.

[8] The average "per stream" payout to rights holders made by Spotify, for example, is between $0.006 and $0.0084.

as the "Youtube of Music" – rely heavily on so-called User-Generated Content (UGC). However, most music streaming services provide content that is not user-generated but instead licensed from record labels. In this sense then, their provision of media content follows an economic model more akin to mass media than to social media.

To-date, the subscription model remains a relatively niche market as most listeners stream music for 'free' on ad-supported services.[9] For this reason - and in order to discuss streaming in relation to Smythe's audience commodity thesis (and its new media updates) – I will focus on ad-supported music streaming in this dissertation. This choice has also been made in order to provide insight into the wider media economy, which is dominated by advertising supported models. Indeed, advertising revenue, as Kunz (2013, 34) writes, "is more important to media channels today than ever before." In 1960, less than half of all media revenue came from advertising. Today, the percentage of media revenue derived from ads stands somewhere between 50 and 80 percent (ibid).

Advertising on music streaming services is heavily data-dependent. For example, Pandora Internet Radio collects personal data when listeners register for the service, and then tracks every song listened to, every 'station' created, and which songs are given a thumb-up or thumb-down, in real time. Data provided by listeners both operationalizes

[9] For example, leading streaming service Spotify recently announced that it reached the 20 million subscriber mark, out of a total of 75 million active users. Even with only a roughly 25% ratio of paying users to active users, this is high compared to most of Spotify's competitors. Pandora Internet Radio has converted a mere 5% of its 'free' listeners to its subscription plan, and advertising accounts for well over 80% of the company's total yearly revenues (Pandora Internet Radio, 2015b).

Pandora's personalized music service and facilitates targeted advertising. Such data is recognized as one of the most valuable assets of any music streaming service.[10] However, building off my critique of the audience/prosumer/data commodity, I argue that it is not listeners, nor their data, that is 'sold' to advertisers. Instead data about such listeners is used to construct segmented 'lifestyle' categories – ie. 'Gamers', 'Foodies' or 'Jetsetters' – that advertisers pay to access. For example, the music data analytics company The Echo Nest (recently purchased by Spotify) identifies "statistically meaningful relationships between music taste and non-musical information including age, gender and dozens of lifestyle categories" (The Echo Nest 2013, 4) that can be targeted by relevant advertisers. The Echo Nest also uses music taste to predict a listener's future 'value' and, in particular, to identify high-value listeners early on so that they can be focused on. In doing so, less attention will be wasted on those listeners who will contribute little advertising value to a service. This is what communications scholar Joseph Turow (2008, 1) describes as "marketing discrimination", whereby "marketers increasingly use computer technologies to generate ever-more-carefully defined customer categories – or niches – that tag consumers as desirable or undesirable for their business." Like urban planners who design an exclusive upscale suburb far from inner city blight, or map a new expressway through the middle of a low-income neighborhood, big data facilitates the

[10] Pandora Internet Radio explicitly states in its privacy policy "we may share your data, including any personally identifiable information, with our successor in interest in the event of a corporate reorganization, merger, or sale of all or substantially all of our assets." (From http://www.pandora.com/privacy, accessed March 20, 2014)

production of a hierarchically ordered digital space. In short, I argue that music streaming services are but one means through which to witness a new type of spatial segmentation occurring online.

**Outline of Chapters**

I have organized what follows in a manner that is somewhat unusual for a dissertation. Rather than provide an exhaustive literature review at the outset, followed by a methodology chapter which is then followed in turn by several case study chapters, this work could be said to most closely resemble an onion, which the reader 'peels' as the argument proceeds layer by layer, chapter by chapter. In this way each contribution to the debate can be carefully considered before being removed, exposing the next 'layer' of the argument. The audience commodity will be given serious consideration, before we move on to its problems, propose a solution, which will in turn be problematized, and so forth.

To be more concrete, in the first chapter of this dissertation, I will give an overview of the audience commodity thesis as developed by Dallas Smythe (1977) and refined by Jhally and Livant (1986) and others over the years. I then move on to contemporary updates of this debate, and the so-called 'prosumer' in an era of social media and 'big data'. In chapter 2, I try on this perspective by examining the "data commodity" produced through "the labour of listening" on music streaming services.

In chapter 3, I begin to ask more critical questions of the audience/prosumer commodity thesis. By constructing playlists and programming 'flow', tagging music, and sharing music through social networks, can music streaming listeners - like the more

common example of social media users - be considered 'prosumers', who 'labour' to produce surplus value for streaming services or social media companies? I argue that such a conception of labour conflates a number of rather different practices and suffers from a lack of analytical rigour. What is more, the so-called 'data commodity' produced through such listener actions, I argue, is in fact a 'fictitious commodity' which generates economic value not from the labour of prosumers but rather through its role in facilitating rent extraction.

The packaging of the audience or user data in the *form* of a commodity allows media capitalists – such as the owners of music streaming services - to extract rent from advertisers in exchange for access to 'media space'. This argument is developed in chapter 4. By referring to Marx's theory of rent, in volume III of *Capital*, I attempt to formulate a more precise theory of the media rent economy than has been developed thus far (ie. Jhally 1987; Caraway 2011; Huws 2014).

In the chapter that follows - chapter 5 - I proceed to look at what it is exactly that advertisers rent from media capitalists. In order to clarify how we can best conceptualize this rented 'media space', I first investigate how philosophers have theorized 'space'. I find Henri Lefebvre's influential theory of the production of space most helpful for our purpose of trying to understand the political economy of music streaming services.

In particular, Lefebvre distinguished between "social space" - "the space of use values produced by the complex interaction of all classes in the pursuit of everyday life" (Gottdiener 1994, 127), and what he called "abstract space". Abstract space is the space of capitalism. "Abstract space is measurable", writes Lefebvre (1991, 352). It is measure

that allows for qualitatively heterogeneous social space to be rendered homogenous and thus quantitatively comparable. This is important for our purposes because a space can be used to extract rent only once it is made abstract and quantifiable.

In chapter 6, I suggest that the history of commercial media can be read as a continuous struggle between 'social space' and 'abstract space'. In particular, I focus on early radio as a social space that was transformed, though never entirely, into abstract space through the imposition of the radio ratings systems. I then explain how early P2P file-sharing services, such as Napster, were gradually transformed from social spaces into abstract spaces. The broad, and partial, historical overview presented here is important as it allows us to see music streaming services as the latest incarnation of this ongoing, conflicted, struggle.

Fortunately, Lefebvre also provides us with a very helpful model to help think through the complexity of how 'abstract space' is produced and challenged. This model – Lefebvre's 'trialectics of space' – is considered by some to be his greatest contribution to philosophical debates about space (see Schmid 2008). It illuminates how "space is produced *by* and productive *of* a dynamic interplay of material, conceptual, and experiential processes" (Nunes 2006, xxi). Lefebvre (1991, 38-39) referred to these three processes, or 'dimensions' of social space as "spatial practice" [space as *perceived* through our senses], "representations of space" [space as *conceived*] and "representational spaces" [space as *lived*].

In chapter 7, I examine in more detail how music streaming services and their listeners produce new spaces of music consumption through the lens of Lefebvre's

trialectical model. By focusing on the interplay between perceptual, conceptual and lived dimensions, we are better able to grasp how the production of abstract space for rent extraction is an ongoing, conflicted process. Since it prioritizes the immanence of such struggles, Lefebvre's trialectical model, I argue, also provides a richer theoretical and methodological lens than the standard Marxist critique of the "enclosure of the common" or ''digital enclosure'' (Andrejevic 2004, 2007).

Finally, I will conclude this dissertation with a chapter that summarizes my main arguments. In place of the Dallas Smythe-inspired "prosumer commodity" and "data commodity" argument, this dissertation proposes an alternative materialist theory of media. I argue that music streaming listeners, like all media audiences, produce 'social space' around media content. Audience measurement – as an abstraction of audience activity – facilitates the production of an increasingly segmented 'abstract space' to permit the extraction of (monopoly) rent from advertisers. Lefebvre's critique of abstract space, in turn, helps us move beyond understanding privacy concerns over data collection in the liberal individualist sense of 'the right to be left alone'. By juxtaposing quantified, 'rentable' abstract space, not with 'private space', but with 'social space', Lefebvre reasserts the primacy of social relations and the notion of the collective subject.

## Chapter 1: Reloading Smythe

### Adorno's 'Little Annie'

In the winter of 1938, Theodore W. Adorno arrived in New York aboard a steamer from Europe. His friend, the Austrian sociologist Paul Lazarsfeld, had successfully secured a position for Adorno on an ambitious cutting-edge research project funded by the Rockefeller Foundation. The "Radio Research Project" was an attempt to understand how Americans listened to the radio so that they could be more effectively targeted by broadcasters and advertisers.[11] Adorno assumed the role of 'Chief of the Music Division'.

The project's crowning achievement was "Little Annie". Officially called the Stanton-Lazersfeld Program Analyzer, "Little Annie" was a simple electronic device that allowed research subjects listening to a radio show to indicate approval or disapproval with the click of a button. The device held by the research subject was connected via a wire to another device in an adjoining room, where responses were inscribed on a paper tape.

A rudimentary version of 'like' or 'thumb' buttons on contemporary music streaming services, "Little Annie" revolutionized how radio, film and television audiences were measured. Far beyond simply registering the brute number or

[11] In his authoritative biography of Adorno, Stefan Müller-Doohm (2005, 544, *n22*) argues that this project "laid the foundations for modern media research."

demographics of the audience for a whole program, “Little Annie” measured the affective intensity of particular scenes, situations, and characters, on a moment-to-moment basis.

“Little Annie” did not impress Adorno though. After only two years on the project, he quit. Not surprisingly, he was positively horrified by the “culture industry” that grew out of such cybernetic forms of measurement. Simply put, culture, for Adorno, is immeasurable. “I reflected that culture was simply the condition that precluded a mentality that tried to measure it” (cited in Müller-Doohm, 2005, 247).

What would Adorno think of the real-time data harvesting facilitated by contemporary online music streaming services? Adorno was already in the late 1930s profoundly disturbed by the way music under consumer capitalism had become abstracted and fetishized. In a paper titled “On The Fetish Character In Music And The Regression Of Listening”, Adorno (1938, 38) writes “[m]usic…serves in America today…as an advertisement for commodities which one must acquire in order to be able to hear music”. Today, when companies like Apple sell music at a loss in order to encourage hardware sales, and as technology companies take over music distribution from record companies, it is tempting to champion Adorno as something of a prophet.

Adorno was primarily concerned with the role consumer capitalism in general, and radio in particular, played in what he deemed ‘the regression of listening’. For Adorno, the emerging medium of commercial radio was transforming music into a standardized and mass produced commodity. This had dire implications for the ‘power’ of music. “Music has become a means instead of an end, a fetish” he wrote. “That is to say, music has ceased to be a human force and is consumed like other consumers' goods”

(Adorno 1945, 211). The ideological implications of radio music deeply concerned Adorno too. In an article entitled "A social critique of radio music", Adorno (1945, 212) opined: “music under present radio' auspices serves to keep listeners from criticizing social realities; in short, it has a soporific effect upon social consciousness.”

However, concerns about music’s degradation and broadcasting’s ideological role prevented Adorno from more fully exploring how the new medium of radio might *itself* be a commodity-producing system open to Marxian materialist analysis. Such an analysis of media and communication would have to wait several more decades to emerge. When it finally did, it sprung not from European critical theory, but instead from the North American tradition of the political economy of communication. It is to the development of this tradition that we now turn.

**What do Media Produce?: Dallas Smythe and the Audience Commodity**

What is the commodity produced by media and communication industries? This “deceptively simple question” as Eileen Meehan (1984, 216) put it, lurks in the shadows behind every attempt to make sense of the political economy of media. It lies behind inquiries whose answers identify rather different roles for media, privilege different topics of inquiry, and ground different analytic frameworks.

The standard answer given by most media, communication and cultural studies scholars is messages, information, images – in short, ‘content’. To take the newspaper industry as an example, socially useful information is transformed, through the wage-labour of the journalist, into a news story, which is, packaged in a newspaper, which is

then sold in the marketplace.

The tendency in communication research to concentrate on content as *the* commodity has had an important side effect: it has served to highlight the relationship between the meaning of this content and the fact that it is a capitalist commodity. This is because newspaper articles or television programs are clearly special commodities. There is a vast difference between news and shoes. Certainly, both a newspaper publisher and a shoe manufacturer mass-produce commodities for general sale on the market. Yet, clearly a newspaper is also a vessel for signification that powerfully influences the shaping of consciousness.[12] A focus on the industrial production of symbols thus naturally calls to the forefront theories of ideology, representation, and hegemony. It was for this very reason that Bill Livant once called the field of communication "a jungle of idealism" (in Smythe, 1977, 3).

In the late 1970s however, Dallas Smythe, founder of the political economy of communications in North America, attempted to challenge this dominant approach to the critical study of media and communication. According to Smythe, the initial realization of the particularity of media commodities had become subsumed in the search for the ideology transmitted via such commodities. The result, he argued, was that critical scholars, like Adorno, tended to overemphasize the ideological dimension of media production.

[12] Of course, a pair of shoes also serves more than a mere functional purpose: they too signify.

For radical critics of capitalism, ideology was seen to be responsible for the maintenance of the capitalist system. For Smythe, the problem with 'ideology' or similar concepts, was that it encouraged functionalist explanations. "[T]he proof of [ideology's] existence is found… to be the necessity for it to exist so that certain other phenomena may be explained" (ibid). In other words, a lack of resistance was proof enough of the existence of ideology. In the first paragraph of his seminal paper "Communications: Blindspot of Western Marxism" (1977) Smythe writes:

> Frequently, Marxists and those radical social critics who use Marxist terminology locate the significance of mass communications systems in their capacity to produce "ideology" which is held to act as a sort of invisible glue that holds together the capitalist system. (Smythe, 1977, 1)

Smythe sought to counter this 'functionalist' and 'idealist' account of communication with a properly materialist Marxist analysis of the media. The "threshold question" critical or Marxist thinkers, should ask about the media, according to Smythe (1977, 2), was "What is the commodity form of mass-produced, advertiser-supported communications under monopoly capitalism?" The inability to answer - or even ask - such a question represented for Smythe a "blindspot" of Western Marxism.

To shine some light on this blindspot, Smythe (1977) suggested that instead of messages, the audience itself be seen as the principle commodity of the mass media. The focus on the media's message was a diversion. For Smythe, the message was simply the bait to lure the audience: what he called the "free lunch". Like a pub that draws in customers with the promise of a free meal and the expectation that customers will purchase pricier drinks once inside, the "free lunch" of TV programs or magazine stories attracts and delivers demographically-desirable audiences to advertisers. In other words,

according to Smythe, the media produce stable audience groups, which are then sold to advertisers.

This “audience commodity”, in Smythe’s formulation, is “a non-durable producers' good”[13] that is used to perform an essential function for advertisers. While watching TV we are learning to buy and thus "working" for advertisers. Thus, Smythe saw audiences as “working” for capitalists outside the media sector, to create the demand for advertised goods. In short, by spending our leisure time in front of the television we are learning what to buy, and in turn, providing both a service to capitalism and working to reproduce our own labour power. The exploitation of "audience power" in the home thus complements and extends the exploitation of labour power in the factory.

In the opening sentence of his seminal essay, Smythe (1977, 1) writes: “[t]he argument presented here…is an attempt to start a debate, not to conclude one”. He certainly succeeded in doing so. By linking media, audiences and advertisers in a set of reciprocal relationships, and by arguing that the audience is actually labouring for the advertisers, Smythe’s intervention stimulated much response and critical engagement at the time (see Murdock 1978, Livant 1979). Further valuable contributions that examined and expanded the concept of the “audience commodity” appeared in the years that

[13] A producers’ good or a ‘capital good’ is a good that is bought in order to make another good; like a printing press bought by a publishing company to produce books.

followed (see Meehan, 1984, 1993; Jhally and Livant 1986/2006).

For example, Sut Jhally and Bill Livant in their influential paper "Watching as Working: The Valorization of Audience Consciousness" (1986), tried to refine Smythe's approach to the issue of audience labour in order to situate it "within the process of communication rather than the process of consumption of goods" (Bermejo, 2009, 137). Focusing on television, Jhally and Livant divided watching time into necessary watching time and surplus watching time: a direct analogy to Marx who divided the working day into necessary time, in which the worker worked to produce the equivalent of the value of his/her labour power, and surplus time in which the worker worked to produce surplus value. For Jhally and Livant necessary watching time is when viewers watch the programs they enjoy, while surplus watching time occurs during the watching of ads. Watching ads thus produces the surplus value, which is transformed into the profits earned by media capitalists. In other words, they argued that the commodity around which the television economy is centered was not so much audiences, but rather "watching time".

**The Prosumer/Data Commodity**

The debate Smythe commenced had clearly cooled off by the last decade of the 20th century (although see Maxwell, 1991). For most scholars of communication and media, the so-called 'Blindspot Debate' seemed to have been reduced to little more than an interesting footnote in the history of our discipline.

Recent years, however, have seen the return of Smythe (see Andrejevic 2002;

Cohen 2008; Kang and McAllister 2011; Caraway 2011; Lee 2011; Fuchs 2010, 2012, 2014). The shift from 'mass' to 'social' media, and the Internet in general, has been the impetus for this return. Smythe's argument appears to be even more suggestive today as Internet users, along with viewing ads, produce content *and* produce data that can be sold to marketers. Let us look at how these two developments in turn have influenced the second life of the 'audience commodity' thesis.

According to Christian Fuchs (2013, 217) "[t]he difference between the audience commodity on traditional mass media and on the Internet is that, in the latter case, the users are content producers; they engage in constant, often creative, activity, communication, community building, and content production." As a result, it can be argued that on sites and for services that depend on user-generated content[14] "[t]he audience is doubly at work, producing the very content it consumes" (Morris 2010, 178). This has convinced some critical scholars that an updating of Smythe's thesis is in order. The term "prosumer commodity" has been put forth by Fuchs (2010) and others (ie. Manzerolle, 2010) to better reflect the shift from (passive) audiences to (active) users who both create and consume content. The 'prosumer' - first hatched in the prescient mind of futurist Alvin Toffler - is a liberated post-industrial character who has

[14] UGC can be understood to include content that requires some degree of creative effort and is "created outside of professional routines and practices" (Kaplan and Haenlein 2010, 61). It can include content ranging from blog posts, product reviews, posts on social network sites, photos, contributions to collaborative projects etc. UGC is often created independently by online users but it is increasingly also being facilitated or sponsored by companies (Berthon, Pitt & Campbell 2008; Christodoulides 2009; Crowds 2011).

transcended the artificial division between production and consumption. With the "prosumer commodity", a critical edge has been added to 'prosumption'. "The category of the prosumer commodity", according to Fuchs (2008, 7) "does not signify a democratization of the media towards participatory systems, but the total commodification of human creativity."

User-generated content though, as Mark Andrejevic (2013, 184) points out "is not simply what users post, but also the huge amounts of data about their activities that they generate unintentionally and often unknowingly…" This 'data commodity' includes information about users' demographic characteristics, their social networks, their interests, and even their browsing and interaction behaviour (Fuchs, 2012, 704). While mass media were also 'interactive'[15], it is the degree of personal information available and the automization of measurement that distinguishes social media from mass media. Simply registering for a social media account can serve up a whole basket of personal details such as one's name, home and email address, nationality, phone number, gender, birthday, income, etc. This data is combined with "IP addresses, pages visited online, length of time spent on websites, ads viewed and clicked on, articles read, purchases made, search terms typed, language, web browser and operating system preferences, and geographical location online and via mobile phones" (Office of the Privacy Commissioner of Canada 2010, as cited in Cohen, 2013, 184).

[15] As pointed out by Griffen-Foley (2004), some of the earliest experiments in making broadcasting 'interactive' were the radio talk-back formats that were developed in the 1950s and 1960s.

Much of this information is collected by third-party companies that have developed sophisticated data mining techniques that monitor your online "chatter" and predict future behavior based on your behavioral patterns.[16] They do this by using scraping software to search the keywords you use and by analyzing your conversations on blogs and social networks (Berkman 2008; Napoli 2011). Data is collected through the use of cookies or beacons, which can track text entered on a website or trace mouse movements (Angwin, 2010).[17]

Such surveillance of interactive media users has been called "dataveillance". Attributed to computer scientist Roger A. Clarke (1994, 122–123), the concept of dataveillance has been used to distinguish automated monitoring through computer readable data from traditional forms of surveillance. "[W]hereas surveillance presumes monitoring for specific purposes" write Jose van Dijck (2014, 205), "dataveillance goes well beyond the proposition of scrutinizing individuals as it penetrates every fiber of the social fabric."

While the inclination has been to critique dataveillance from a privacy perspective, critical scholars such as David Lyon (1994) and Oscar Gandy (1993) have recognized that the laudable attempt to defend privacy has a disconcerting side-effect: it

[16] This online data is matched with data collected through your purchasing behaviour offline, through loyalty cards for example.
[17] A Wall Street Journal investigation in 2010 found that the 50 top websites in the US installed an average of 64 pieces of tracking technology onto the computers of visitors, usually without warning. (Angwin, 2010)

tends to make information even more valuable as a commodity, thus encouraging its exploitation. Databases containing personal information are so expensive, in part, because they are proprietary (Andrejevic, 2002, 232).[18] As Lyon (1994, 21) argues, "[p]rivacy grows from the same modern soil as surveillance, which is another reason for doubting its efficacy as a tool of countersurveillance".

Critical scholars influenced by Smythe's legacy realized early on that "dataveillance" needed to be theorized beyond its implications for personal privacy and individual freedom. As Mark Andrejevic eloquently put it, the *work of being watched* (Andrejevic 2002, 2004) appears to be steadily eclipsing the *work of watching*. From this vantage point, the role of the audience expanded to include the generation of personal information that could be sold to marketers, alongside watching commercials and learning to buy the goods and services advertised.

Andrejevic has perhaps been the most consistent and insightful interpreter of the "self-reinforcing spiral of surveillance and self-disclosure".

> Downloading a book or programming a digital television set generates information that can be repackaged, sold and eventually incorporated into customized products whose consumption generates ever more specific demographic information. If, within the digital enclosure, surfing the web doubles as a form of self-disclosure, and if this self-disclosure generates commodifiable information, then the more one consumes, the more one specifies who one is

[18] As Gandy (1993, 188) points out the concept of privacy is itself partially responsible for the commercialization of personal information. "Name and likeness can only begin to command a commercial price in a society which recognizes that there is a …right to control the conditions under which name and likeness may be used. Property becomes a commodity subject to be bought and sold only where the community will enforce an individual's right to maintain use and possession of it against the world" (Bloustein, 1964).

> (from a marketing perspective), and thus what one wants. Full attainment of desire is predicated on complete disclosure (Andrejevic, 2004, 199).

This 'digital enclosure' should not be understood as a 'place' in any static, inert sense of the term. It is instead a process "whereby activities formerly carried out beyond the monitoring capacity of the Internet are enfolded into its virtual space" (Andrejevic, 2002, 238).

Music streaming is a good example of how this 'enfolding' occurs. One need only compare the monitoring capabilities of Pandora Internet Radio to terrestrial radio to understand what Andrejevic is talking about. Real-time feedback systems provide companies like Pandora Internet Radio with an additional 'data commodity' and provide us with an exemplary distinction between the 'audience commodity' of terrestrial radio and the 'prosumer commodity' of contemporary streaming services. Let us now look more closely at precisely how Pandora - the leading audio streaming service in the US - collects data on its users.

**The Music Data Commodity: Pandora Internet Radio**

Terrestrial radio, like all broadcast media, has long relied on the ratings industry to generate data about listeners. However, as Philip Napoli (2003) has long pointed out, the *measured* audience provided by ratings companies such as Nielsen, must be understood as markedly distinct from the *actual* audience listening to the radio. Radio listenership – as will be discussed in chapter 6 - has always been very difficult to estimate.

When music consumption has involved a material commodity – vinyl, cassettes,

or CDs - the data that could be collected about listeners and listening was also very limited. What people listened to, how often they listened to it, when and where it was listened to, was largely unknown. Even after Nielsen began employing the SoundScan media measurement system in 1992, the music commodity exchange relationship ended at the record store checkout counter. How many times or where you listened to the album purchased was unknown once you left the record shop. Perhaps it became the soundtrack of your summer. On the other hand, maybe it was purchased as an ill-advised gift, never to be listened to again.

With online music streaming, all listening time becomes data-generating time.[19] Because a login is required to gain access to these services, music streaming services are able to measure users in several different ways, providing a record by location, age, and gender of who is listening to a track and where it is being listened to, every single time it is played.

With 79.2 million active users (Pandora Media, Inc. 2015), it is no exaggeration to say that Pandora Internet Radio is sitting upon a mountain of listener data. A close reading of Pandora's most recent privacy policy reveals the various ways the company

[19] David Arditi (2013, 171) makes the argument that music fans who downloaded song files from P2P services such as Napster were already "labouring for the record industry". Arditi (2013, 172), referring to Smythe's audience commodity thesis, demonstrates how the act of downloading music creates an audience commodity used to generate profit. He calls downloaders 'indirect knowledge workers' (Fuchs 2010, 186) because "although they create surplus value for the major record labels, they are not directly producing knowledge, but rather produce the data that is used as knowledge" (Arditi, 2013, 172).

collects information from its users.[20] These methods can be categorized as follows:

-data that is directly provided by the listener
-data that is provided by the device used by the listener
-data that is collected from third parties about Pandora listeners

When a new listener signs up for an account on Pandora Internet Radio, the listener's age, gender, email address and zip-code are collected at the point of registration.[21] Pandora also conducts frequent surveys of listeners to further enrich the limited information it collects at the point of registration. For example, Pandora does not ask for one's ethnicity/race when a new listener registers for the service. However, such information is highly attractive to marketers so Pandora captures it during a yearly survey it conducts.

Pandora also offers publicly accessible profile pages, which new listeners are encouraged to fill in with their information. Upon registering for Pandora, one's profile and listening activity is made public by default. Pandora reminds its users in its privacy policy that any information placed on one's user profile may be read, collected, and used by others who access the page. This means that other companies can scrape your information to develop or enrich their own profiles about you. Even if you manually change the settings on your Pandora profile to private, the list of stations you have created can be seen by anyone who enters your email address into Pandora's search

[20] Effective as of December 17, 2013. The information provided below was gathered from Pandora's website (http://www.pandora.com/privacy) on March 20, 2014.
[21] The listener's name and credit card information is required only if s/he subscribes to the paid subscription version of Pandora.

system.

Listeners can also contribute to Pandora's community forums, blogs, and pages on social media platforms. Pandora collects and stores on its servers any content or information listeners choose to post on these forums, on Pandora's blog or their social networking pages, and on any services accessible through Pandora (such as Facebook). Such information is shared with third party service providers in order to regulate listeners' use of Pandora, and to optimize the advertisements targeted at listeners.

In order to remove personal information from Pandora's public forums, listeners must contact Pandora by email, and even then, it is not always possible to remove personal information in its entirety according to Pandora. What is more, a complaint email will only provide the company with more data as Pandora records data from listeners whenever they send emails to the company, respond to ads, or sign up to receive emails or newsletters.

Pandora Internet Radio places cookies on listeners' hard drives to track their movements to, and through, its service. Other data that can be collected by cookies include valuable information such as a user's IP address, the page or site that referred a particular user to Pandora, and the specific date and time a user visits Pandora. Alongside such "first party cookies" used by Pandora, advertisers and advertising partners can place what are called "third party cookies" on a user's hard drive. Such cookies help determine whether a user has seen and interacted with a particular ad. Finally, beacons and tracking pixels are further technologies employed by Pandora Internet Radio to better measure the effectiveness of marketing campaigns and other communications. Beacons, for example,

transmit “anonymous, non-personally identifiable information” to a server whenever a Pandora listener opens an email sent by the company.

Pandora’s privacy policy clearly states that they “do not have access to or control over cookies placed by advertisers and other third parties” (Pandora Internet Radio, 2013). The company’s privacy policy also states that “Pandora may collect certain non-personally identifiable technical information through the use of log files and servers” including “IP address, browser type, Internet service provider, date/time stamps, MAC address, file requested, and other usage information and statistics.” If you access Pandora from a computer, Pandora’s servers record information about your computer and browser, including your Internet Protocol (IP) address, browser type, and other software or hardware information. If you listen to Pandora on a mobile phone, tablet, in your car, or through other consumer electronic device, Pandora collects information about “device type, operating system version and type, unique identifiers (such as Android ID, VIN, MAC address, and IDFA), and carrier or other transactional information for that device” (ibid).

There are some aspects of listening that Pandora still is not able to track. In particular, information about a listener’s location is currently limited to one’s zip code. Pandora claims to not track any real-time location-based information from mobile

phones, tablets, or automobiles.[22] Nevertheless, this is certainly being studied and may be implemented in the near future.[23]

Finally, Pandora can collect information from anyone who stores or posts information about you on Pandora's community features. It also collects information if you enable connectivity "with another website, application, or service where friends or other listeners store such information" (ibid). A common example of this is personal information about you that resides in your friends' address books, or photos of you that your friend has posted to Pandora or any other websites, applications, or services with which Pandora interacts.[24] Numerous social media websites and applications that listeners have registered for have integrated their services with Pandora's.[25] Unless you opt-out of such sharing, those websites and applications automatically provide Pandora with information about you "to facilitate personalization" (ibid). Pandora explicitly states in its privacy policy that it may collect information about its listeners from third parties and store it on the company's servers along with personal information it has directly amassed about its listeners. These third parties include "service partners and advertisers

[22] However, Pandora has been accused of transmitting a user's location, as well as unique identifiers for their phone, to various advertising networks. (see https://www.veracode.com/blog/2011/04/mobile-apps-invading-your-privacy)

[23] Pandora's privacy policy states "[i]f at some point we enable GPS or near-real location tracking technology, you will be asked to consent to allow such collection and use."

[24] Pandora explicitly states that it is not liable if one of its business partners violates its own privacy policy or any applicable laws while collecting, using or sharing your personal information. (Pandora Internet Radio, 2013)

[25] Pandora reserves the right to share anonymous, non-personally identifiable information about its listeners with third parties. The company claims that in such cases they de-identify personally identifiable information and share it in an anonymous or aggregated form with third parties, advertisers, and/or business partners. (Pandora Internet Radio, 2013)

that make features or content available" on Pandora and "marketing companies and data providers that create professional marketing lists or sell other marketing data" (ibid). Pandora also gets affiliate sales information from its iTunes and Amazon buy buttons.

Importantly, one's data, once collected, becomes, for all intents and purposes, the property of Pandora Media, Inc. Pandora's privacy policy clearly states that the company reserves the right:

> …to share your information, including personally identifiable information, in order to (i) protect or defend the legal rights or property of Pandora, or the legal rights of our business partners, employees, agents, and contractors (including enforcement of our agreements); (ii) protect the safety and security of Pandora users or members of the public including acting in urgent circumstances; (iii) protect against fraud or risk management purposes; or (iv) comply with the law or legal process. (ibid)

**Labour: 'Digital' and 'Free'**

The above discussion provides some detail on Pandora Internet Radio's collection and leveraging of personal data as a 'data commodity' that drives its capital accumulation strategy. Such practices have become standard across the new media landscape, particularly since the emergence of social media services. Like the 'audience commodity', the 'data commodity' argument revolves around framing the act of consuming media as an act of labour that is productive of value. In his work, Christian Fuchs attempts to apply Marx's labour theory of value to explain value production on social media platforms.

> The law of value also applies in the case of commercial social media: The more time a user spends on commercial social media, the more data about her/his interests and activities are available and the more advertisements are presented to her/him. Users spending a lot of time online, create more data and more value (work time) that is potentially transformed into profit. (Fuchs, 2014, 119)

We can see here that Fuchs extends Smythe's earlier argument in a similar way to Jhally and Livant's earlier reformulation of the audience commodity. Instead of audiences working for advertisers, as was Smythe's argument, Fuchs instead claims that social media users are actually working for social media companies. The source of the massive profits of corporations like Facebook, according to Fuchs (2012, 708), is the 'digital labour' of prosumers.

> Their digital labour creates social relations, profile data, user-generated content and transaction data (browsing behaviour) – a data commodity that is offered for sale by Internet corporations to advertising clients that can select certain user groups they want to target.

Within similarly critical accounts, it is common to read descriptions of the internet, and social media in particular, as a 'social factory' that relies on the 'free labour' of internet users. The use of the concepts 'social factory' and 'free labour' should alert us to the presence of another influential body of Marxist theory. Indeed, the return of Smythe has been, in part, inspired by the simultaneous ascendency of autonomist Marxism in English-language critical theory. This school of Marxism is too complex and contradictory to adequately summarize here, but as Allison Hearn (2011, 315) points out, autonomists "offer ways to think about the conflation of textual or semiotic production and the real material conditions of media production and about the role of viewers and…participants in processes of value generation."

While there are notable and important differences between the Marxisms of Smythe and that of autonomists, concepts developed by Antonio Negri, Mario Tronti, Maurizio Lazzarato and other autonomists productively compliment and extend many of

Smythe's ideas.[26] For example, Mario Tronti's concept of the 'social factory' nicely captures Smythe's (1977, 23 *n*22) observation that "all non-sleeping time under capitalism is work time".[27] The critical and (as we'll see) controversial contribution made by both Smythe and the autonomists is that leisure time should not only be conceived of as 'labour' but that it should also be understood as labour that is productive of surplus value. While Smythe, and even more explicitly Jhally and Livant (1986), argued that watching advertisements produced surplus value, Tiziana Terranova (2000, 36) theorized the "free labour" of early online netizens as "a fundamental moment in the creation of value in the digital economies".

In recent years, Smythe's thesis has inspired work on cases that have examined a range of platforms and formats; including reality television (Andrejevic, 2002b), TiVo (Carlson, 2006), radio broadcasting (Stiernstedt, 2008) and Google (Lee, 2011, Kang and McAllister, 2011). Other notable works on reality TV (Hearn, 2006), Myspace (Cotes and Pybus, 2007), Facebook (Cohen, 2008) and Web 2.0 more generally (Fuchs, 2010),

[26] Despite many productive similarities, Cote and Pybus (2007, 98) describe Smythe's understanding of the 'audience' as "rather static and preformed" and it is important to heed their warning to not "remake Smythe into an Autonomist".

[27] Indeed, Smythe himself noted the commonality between some of his ideas and those held by autonomist Marxists. In his influential book *CyberMarx* (1999, 280 n. 106), Nick Dyer-Witheford relays that "[i]n a personal conversation shortly before his death Smythe agreed that his perspective converged with the autonomist's 'social factory' analysis".

have drawn on both Smythe and the autonomist Marxist tradition.

The relatively recent emergence of streaming music services has meant that this sector has not received much attention from scholars interested in progressing heterodox Marxist lines of thought. There is likely a more implicit cultural bias that lurks behind this oversight too. Kate Lacey begins her authoritative book *Listening Publics* by pointing out how the act of listening has long been overlooked in audience or reception studies. As she explains, this neglect of listening is deeply embedded in "a cultural hierarchy of the senses that privileges the visual over the auditory…and a logocentric frame in which listening is encoded as passive in opposition to the *acts* of writing, reading and speech" (Lacy 2013, 3). This neglect is curious given that the word '*audi*ence' etymologically privileges the act of listening.[28]

That said, righting the unfortunate visual bias in contemporary communication and cultural theory is not the purpose of this dissertation. Instead, I want to make the less-ambitious case for why the streaming music sector provides us with a fertile terrain on which to debate the merits and limitations of the audience/prosumer commodity and 'free labour' theses. In the next chapter, I will discuss some of the ways that listeners on these services could possibly be seen to be engaging in the 'free labour' of prosumption before we move on to a critique of this perspective and consider alternatives Chapter 3.

[28] According to the Online Etymology Dictionary (n.d.) the noun 'audience'is derived from Old French 'audience', meaning "the action of hearing," and from Latin 'audentia': "a hearing, listening". It was only in 1855 that the privileging of listening transferred to a visual reference to "readers of a book."

## Chapter 2: The 'Labour' of Listening

Music streaming services provide us with an important case through which to examine the continued relevance of the so-called 'audience commodity' thesis. As mentioned above, such services exhibit characteristics common to both mass and social media forms. If we broadly define music streaming services to include Youtube, then user-generated content plays a central role. More music is streamed on YouTube than any other streaming service and much of this musical content is user-generated.[29] Other prominent streaming services also encourage such content. The Berlin-based company SoundCloud – commonly referred to as the "Youtube of Music" - allows users to directly upload their tracks for everyone to hear.[30] As a result it has become massively popular amongst indie musicians, and particularly with DJs.

However, in general, music streaming services provide content that is not user-generated but instead produced by professional musicians.[31] In this sense then, their provision of media content follows an economic model more akin to broadcast radio, and mass media in general, than to social media. In other words, to use Smythe's analogy, the 'free lunch' is prepared by professional cooks rather than the diners themselves.

At the same time however, music streaming services diverge from mass media in

[29] Nevertheless, we will not be focusing on Youtube in this dissertation. Instead, we will focus our discussion on purely audio-based music streaming services.
[30] According to Billboard, roughly 80% of SoundCloud's current uploads are from user-generated content, while 20% are uploaded from record labels (see Hampp, Christman, & Peoples, 2014).
[31] To upload one's music to most streaming services requires the intermediation of an artist aggregator, such as TuneCore.

allowing listeners much more input and control over programming. The degree of control ranges from choosing 'seed' songs and providing feedback signals on 'non-interactive' radio services such as Pandora, to on-demand listening and playlist construction on services such as Spotify. Whether listening to non-interactive or on-demand services listeners are far from passive. The key point of distinction made by scholars conversant with the critical political economy tradition is that they refuse to celebrate such developments as (solely) a story of how audience agency has been freed from the shackles of centralized mass media control. Instead, such scholars direct our attention to the processes through which user input and participation are enrolled in new media accumulation strategies. Jeremy Morris (2010, 298) for example, argues that "fan labour provides a key source of value for cloud-based (music) services, whether that's in providing the content for the various sites, feedback on the music through ratings and play counts, or as discussion moderators or online reviewers." In short, 'free labour' masquerades as 'freedom'. Let us now look in more detail at how music streaming services facilitate and encourage user participation and how this phenomenon can conceivably be understood as an instance of 'labour'.

**Mixing: The 'Labour' of Programming and Generating Playlists**

If we compare the labour performed by Smythe's 'audience commodity' and the labour of the so-called prosumer commodity, arguably the most significant transformation lies in the role that prosumers play in programming content. In Smythe's day, audiences had little say in shaping television and radio schedules. Television

programs were assigned to days and times when their targeted demographic was most likely to watch: soap operas played on weekday afternoons, cartoons on Saturday mornings.

To prevent audiences from leaving between programs the purpose of programming in the mass media age was to introduce a sense of continuity. The classic study of the importance of programming continuity appears in Raymond Williams' *Television: Technology and Cultural Form*. Always the perceptive analyst, Williams (2003, 86) recognized what he called "flow" to be "the defining characteristic of broadcasting". Williams pointed out the often forgotten and ignored obvious; that with all preceding communications systems the "essential items" – be it a book, a meeting, a play - were discrete. What distinguished broadcasting in general, and television in particular, was how entire evenings were designed around the purpose of retaining or "capturing" viewers.[32] Thus, Williams argued that television programs needed to be understood as "highly organized units in the wider televisual economy" (Elmer, 2004, 16). Programs needed to be understood in relation to one another because each element reinforced the other.

Today, 'flow' has taken an "algorithmic turn" (Van Dijck and Poell, 2013, 6). On interactive new media platforms, users participate in "steering content" (ibid). This represent a break from the logic of "programmed flow". Nevertheless, in the same way

[32] This is particularly clear when we look, as Williams did, at the way programs attempt to grab viewers at the beginning of a show, and keep their attention with orders to ''stay tuned for . . .'' at the end of a show.

that Williams encouraged communication scholars to look at programming instead of just programs, on music streaming services we need to look beyond the individual song and acknowledge the importance of the station or the playlist in maintaining the listener's attention. Recognition of the myriad ways listeners contribute to shaping the presentation of content on music streaming services also forces us to accept a broader definition of what we mean by user-generated content. In short, 'content' on streaming services does not begin and end with an individual 'song'. Instead, it is the user-generated station or playlist that characterizes the distinctive listening experience brought about by the move to streaming music.[33]

Non-interactive personalized internet radio services, such as Pandora Internet Radio and iTunes Radio, permit listeners to build stations around 'seed' songs, artists or genres. By providing feedback the station adapts in real-time to fit the listener's taste. For example, giving a thumbs up to a particular song on Pandora will ensure that the listener hears songs judged most like it more frequently. Thumb down or skip a song and the song will not play on that particular station again. On such services "the concepts 'programming' and 'flow' acquir[e] a different meaning, shifting their emphases from content and audiences to *code* and *users*, and from programmed flow to *programmability*" (Van Dijck and Poell, 2013, 5).

[33] This issue received attention in legal circles in 2013 when the British record label Ministry of Sound sued Spotify for offering user-generated playlists that mimicked the song order of the label's compilation albums. Spotify and Ministry of Sound eventually settled out of court.

On-demand streaming services, such as Spotify or Rdio, facilitate programmability by encouraging the creation of listener-generated playlists. Spotify alone has over a billion such user-created compilations. On my personal Rdio account, I have created dozens of playlists. Rdio keeps track of the number of plays each playlist generates, how many of my friends have listened to each playlist, the number of subscribers a playlist has, which Rdio listeners have most recently listened to a particular playlist, and if there are any reviews. Rdio also permits collaboration between two Rdio members on playlists.

While most streaming services permit and encourage playlist creation, the streaming service 8tracks – whose tagline is "handcrafted internet radio" – is a good example of a service that fully depends on user-generated playlists.[34] Once users, or 'DJs' as they are called, have opened an account, they can create their own mixes consisting of at least 8 tracks (hence the name). Songs are uploaded from one's personal music library or directly accessed through the SoundCloud streaming service. Thus, 8tracks' user-DJs

[34] 8tracks is only the most recognizable of a contingent of streaming services that revolve around the mix tape idea. Muxtape, an early example of this model, was eventually shut down due to licensing concerns. Like Pandora Internet Radio, 8tracks is designated as a non-interactive internet radio service and licensed under the Digital Millennium Copyright Act (DMCA). In return for lower royalty rates than paid by on-demand "interactive" streaming services (such as Spotify) 8tracks must follow programming rules that limits the number of songs that may be transmitted from any one album or any recording artist on a given channel or playlist during a three-hour period. To quote from the 8tracks website: "…the rules of the compulsory license require that the sequence of playback cannot be pre-determined by a listener, and the listener may also not know what song he or she will hear next (i.e., no pre-announced playlist). Accordingly, a user cannot see the all of the songs included within a playlist at the outset and then fast-forward or rewind to songs of interest (which would make the service interactive). Similarly, there are limits on (a) the number of songs that can be included from any one artist or any one album on a given channel or playlist within a 3-hour period, and (b) the number of tracks that can be skipped per hour on a given channel. (8tracks, n.d.)

create the service's content in the form of mixed tape-style playlists.[35]

It is hardly surprising to learn that listeners enjoy creating their own playlists. This practice can be traced back to the late 1960s when mix tapers began to use blank cassettes to disassemble the album format, taking the selection and ordering of songs into their own hands (Drew, 2005, 535). Nevertheless, digital distribution and the Internet truly opened the floodgates of playlist generation. Much was made of the liberation experienced by music consumers when digital audio players, particularly the Ipod, first reached mass popularity.[36] Free to organize songs in whatever order desired, digital audio players released the creative potential of music fans.[37] Playlist generation also consumed a lot of their time. Through his research into the culture of mobile listening, Michael Bull (2006) has documented the countless hours spent by Ipod owners creating playlists for themselves. Though there is a lack of academic work exploring the practices of music streaming service users, listeners on such services clearly devote considerable time to crafting personal playlists, or working with friends on creating collaborative playlists.

Indeed, streaming services would like listeners to dedicate as much time as possible to building and tweaking playlists. The more time listeners spend on 'curation'

[35] On the company's homepage they claim that listeners can browse 4,749 mixtape playlists that have to-date been created (as of July 18, 2014).
[36] "Your Playlist Can Change Your Life" was the title of one recent popular book. Of course, this same phenomenon has caused much worry about the viability of the album.
[37] In 2004, with the release of iTunes 4.5, Apple unveiled 'iMix' – its popular user-contributed mix service. However, as Rob Drew (2006, 541-42) points out the original concept of user-contributed music playlists can be traced back to a late 1990s website called Uplister. While it didn't host files or permit links to music content, Uplister allowed indie music fans to post lists of songs and comments about these lists.

the less chance they will switch to a competitor. Engagement, in other words, is good for listener retention. Spotify investor and board member Sean Parker sounded like a drug dealer giving away free samples when he explained the reasoning behind Spotify's free trial period:

> We're going to have this six-month period where the user gets to bake in the system, get to build their library, build playlists, become addicted to the experience, to the point where they want that experience with them everywhere they go…at which point they're much more likely to subscribe (quoted in Levy, 2011).

Playlist generation is typically portrayed as an enabler of user agency rather than a case of labour exploitation. However, in an article called *Mixed Blessings: the Commercial Mix and the Future of Music Aggregation*, Rob Drew describes user-contributed mixes as an instance of "free labour".[38] Drew argues that "commercial mixers deploy the rhetoric of mix taping in order to commodify a culture practice that people have engaged in freely and noncommercially for decades…a kind of re-commodification of the gift economy of home mixing" (2005, 543).[39] The irony, as Drew (ibid, 533) points out, is that when the blank cassette first became popular amongst consumers in the 1970s, the music industry loudly complained that home taping was killing music. The reemergence of the mix-tape trope amidst the ruins of that very industry hints at the profound changes currently

[38] That playlist creation requires effort is humorously hinted at by the Spotify app 'Lazify' which generates automatic playlists from a single track or artist. The app advertises itself by proclaiming: "Lazify creates an awesome Spotify playlist without any effort! Being lazy is fun!" (Lazify, n.d.)

[39] While playlist creation is largely an example of unwaged 'fan labour', as the Wall Street Journal recently pointed out, the 'professional playlist maker' is also emerging as a niche career in the digital music economy (see Jurgensen, 2014).

underway.

**Tagging: The 'Labour' of Organizing Music**

Allowing users to tag digital items has become a popular practice amongst web 2.0 companies. As a result, Internet users are increasingly taking part in the labeling and indexation of content.[40] The practice has even given birth to a new term – folksonomy – a portmanteau of folk and taxonomy (Van Der Wal, 2007). Many music streaming services allow social tagging so as to encourage their users to tag the music they listen to. As the Echo Nest's Paul Lamere (2008, 101) explains:

> Social tags are the result of collaborative tagging. In a social tagging system, an individual applies short, free text annotations (tags) to items, typically to organize their personal content. These tags can be combined with those created by other individuals to form a collective body of social tags. With a large enough set of taggers generating many tags, a very rich view of the tagged items emerges. Social tags are typically used to facilitate searching for items, exploring for new items, finding similar items, and finding other listeners with similar interests.

Tagging can provide a significant source of human-generated contextual knowledge about music.[41] With the transition from CDs to digital files, music lost "contextualizing information" such as album art and liner notes (Morris 2012, 2). Thus, tagging music plays an important role in this recontextualization process, helping users "recognize, sort, collect and use digital music" (ibid).

[40] One study indicated that 28% of Internet users have tagged or categorized content online, while on the avearge day, 7% of Internet users tag or categorize online content (cited in Lamere, 2008, 102).
[41] As the Echo Nest's Paul Lamere (2008, 101) points out, there is also a great deal of irrelevant information and noise in the tags.

The social music site Last.fm allows its users to tag all music items - each track, album and artist - with free form text. Listeners can search for songs or artists that have been tagged with a certain label, or they can tune in to Last.fm's "Tag Radio". Such tags can then be used for tag-based visualizations and to improve search capabilities of music discovery sites. A TagCloud visualization of the top tags generated by users on Last.fm shows that most of the popular tags are genre-related ('alternative', 'electronic', 'rock') (Chen et al. 2010), but there are also tags related to instrumentation, music style and locale.

Last.fm accumulates significant knowledge about music and listening behaviour from how its users choose to categorize music. "Tag is more powerful than genre", says former Vice-President of Product at Last.fm, Matthew Hawn. "We have input from 40 million experts." Certainly, there are large discrepancies between how two users decide to describe a song or an artist. When critical mass is achieved, however, certain tags become dominant for a specific song or artist.

Table 1 below displays the most popular tags and the frequencies of tags applied to the band *Deerhoof* by Last.fm listeners. The range of terms used by listeners to describe this band – from 'Noise rock' to 'Electronic' to 'Japanese' – reveal far more about Deerhoof than we would learn from the iTunes music store description of the band as "Alternative".

| Tag | Frequency | Tag | Frequency |
|---|---|---|---|
| Experimental | 459 | Avant-Garde | 27 |
| Indie | 455 | Electronic | 22 |
| Seen live | 288 | Art punk | 21 |
| Indie rock | 271 | Kill rock stars | 19 |
| Noise rock | 154 | Punk | 18 |
| Noise | 129 | Art rock | 18 |
| Rock | 111 | Weird | 16 |
| Indie pop | 103 | San Francisco | 15 |
| Alternative | 63 | American | 14 |
| Noise pop | 48 | Post-punk | 13 |
| Female vocalists | 45 | Japanese | 12 |
| Post-rock | 31 | Fun | 12 |
| Pop | 29 | Math-rock | 11 |

Table 1. Top 24 tags applied to Deerhoof (from Lamere, 2008, 102)

At Last.fm's peak[42], users applied approximately 2 million tags per month (Lamere, 2008). Still, there are many artists, and especially tracks, that remain untagged on

[42]Last.fm no longer provides music directly to its users.

Last.fm. For new music and for unpopular music, there are not enough tags to adequately characterize the music. To extract more tags from users, tagging games have been developed in order to make the 'work of tagging' entertaining and addictive. One such game, called 'MajorMiner' collects about five song labels per user-minute while the 'Listen Game' collects six explicit labels and eighteen implicit labels per user-minute. These tagging rates are very high compared to the rates of tagging on Last.fm which, on average, collects less than one tag per user per month (Lamere, 2008, 109).

Social tagging is being put to use by Music Information Retrieval (MIR) researchers to help manage a digital music economy characterized by extreme abundance. Once a music streaming service amasses a library of a few million songs, the primary way to differentiate itself from its competition is to provide better recommendations. Thus, there is something of an arms race underway between music analytics companies to figure out the most accurate and meaningful way to organize and categorize digital music. Social tagging dramatically reduces the costs associated with training computers to identify and distinguish between genres and to build music similarity models.

Mention of the economic incentives involved in encouraging collaborative tagging should heighten our sensitivity to concerns about the exploitation of what Terranova (2000) deems 'free labour' - useful and value producing labour performed without economic compensation. The unpaid classification and cataloguing of music replaces what has traditionally been the work of paid industry professionals (Negus, 1998). As well as performing 'free' - as in unremunerated – labour, music taggers can also be seen as engaging in what Maurizio Lazzarato (1996: 133) calls "immaterial

labour" - "the labour that produces the informational and cultural content of the commodity." Instead of producing a material thing, immaterial labour produces a social relation. Music taggers situate themselves as interfaces between the music commodity and the music consumer, bringing the two together through their labour. That this labour is voluntarily given, and even a source of pleasure, should not distract us from the economic role that it increasingly plays in contemporary capitalism.

**Sharing: The 'Labour' of Marketing Music**

Promoting a band or an artist and sharing music with friends has always been a large part of what being a music fan is all about. In a co-written piece published in the *International Journal of Cultural Studies*, Nancy Baym and Robert Burnett look at Swedish indie music fans and the myriad ways these fans support their favorite bands. They include activities like booking shows for bands, arranging travel, creating playlists and more. While understood as 'labours of love' by many fans, Baym and Burnett (2009, 441) point out that these activities "would be considered professional labour when done by anyone at a major label, radio station, management company, or press outlet and a fair wage for their efforts would be mandatory." In a later article, Baym (2010, 179) writes that fans also work to filter, organize and promote music by "engaging in practices such as rating songs on Amazon, feeding their iTunes information to Apple for its Genius algorithms, tracking their listens through Last.fm, and listing favorite bands or posting links on their profiles on social networking sites such as Facebook and MySpace."

The seeds for such bottom-up music marketing were planted in the renegade days

of early peer-to-peer file sharing. Napster was shut down before it could fully take advantage of the promotional potential of its tech-savy and taste-maker user base. However, as Joseph Menn (2003, 172) wrote in his book about Napster:

> [Napster co-founder Sean] Parker imagined the system would allow users to post personal profiles, showing what music they had available, what they were listening to most, and what they had been playing most recently. If another user downloaded a file from that person, they might want to see what else the person was interested in.

On contemporary music streaming services, it might be argued that almost every action performed by listeners is an act of promotional labour. Much of this 'labour' is performed passively as listening activity is automatically broadcast to connected friends on streaming services, or even through connected social media networks.[43] You can see the songs that your friends are listening to, the playlists they compile, and the bands they discover. You can designate certain listening sessions as "private" or turn Facebook integration off, but the base assumption is that you should want to share your listening activity with friends. Top artists, albums, and songs are listed and broken down by the number of times you have listened to them. If several friends listen to the same song or artist, this connection is noted.[44]

Thus, the simple act of listening to a song operates simultaneously as an act of

[43] Most music streaming services either require, or highly encourage users to register and log in through their Facebook account. Early on in this integration, listeners automatically shared their listening activity, in real-time, with their Facebook friends. Resistance to this trend of "frictionless" sharing has meant that most services have discontinued this practice (see discussion in Chapter 7).
[44] This of course raises some interesting questions, which we have to bracket for now: for example, how does knowledge of the visibility of our listening choices affect these choices?

marketing that song. As I write this, I intermittently glance at my open Spotify app. I see in the timeline that one of my friends has listened to a newly released 'Cat Mountain King' single. I mentally make a note to check out the song. Here we can see that the recommendation labour of record store clerks and local radio DJs has been partially replaced by the 'collective intelligence' (Levy, 2001; Jenkins, 2002) of social media users.

At times such promotional 'labour' is explicitly recognized and rewarded.[45] Before it was purchased by Beats Electronics, the streaming platform MOG offered its service for free to users who shared the most music. New users were assigned a "gas tank" with a certain number of songs in it when they joined the service. MOG promised to top off the tank of users who shared songs promiscuously. "The amount of free music you can get is based on how many friends you have," remarked David Hyman, founder and former CEO of MOG. "If you're really viral, you'll never have to pay. Real tastemakers will get free music forever" (Levy, 2011).

Such promotional activities are typically characterized as technologically enabled extensions of the type 'labour of love' fans have always engaged in when promoting their favorite artists by word of mouth. However, according to Jeremy Morris (2010, 298), what distinguishes traditional forms of 'fan labour' from the contemporary computer-

[45] When Spotify first launched its service in the US in the summer of 2011, it rewarded Klout users who invited 5 friends to sign up to Spotify with premium services for one week. "This concept of exclusivity and personal targeting helped create organic 'spokesman-ship' among influential users" (Carroll and Knight, 2011).

mediated examples discussed above is "the extent to which this labour can be tracked, exploited and put to use for purposes other than leisure and the degree to which it is embedded into the very business model of the service itself." As Morris (ibid) puts it, "users cannot participate in cloud music without working."

**Conclusion**

The discussion thus far has attempted to demonstrate in more detail the myriad ways that music streaming services engage users to interact with digital music content. By constructing playlists and programming 'flow', tagging music, and sharing music through social networks, music streaming listeners - like the more common example of social media users - could be considered 'prosumers' producing the very content they consume.

Of course, most of the music on streaming services such as Spotify, Deezer, and Pandora, has been provided by professional musicians who are paid for the provision of such content. In this sense, music is the 'free lunch' that attracts listeners to these services, performing the role that television programs played in the original 'Blindspot Debate'. But as I've argued, this should not distract us from the role listeners have in shaping the *form* such content takes on music streaming services (playlists), providing the informational and cultural content of the commodity (tagging metadata) as well as performing the 'labour' of circulating and promoting such music content.

The key assumption made by the few scholars (ie. Drew, 2005; Morris 2010; Arditi, 2013, Burkart, 2013) who have considered digital music from such a perspective,

is that the **'**labour of listening' is productive of surplus value. As Patrick Burkart (2013, 405) puts it, on cloud-based streaming services "[f]ans' comments, playlists, recommendations, news, reviews, and behavioral profiles are commodified by the services and retained as surplus value."

In making the claim that such fan activities constitute surplus value-producing labour, these scholars are following more general critiques of the exploitation of 'free labour' (Terranova 2000) or 'digital labour' (Scholz, 2012; Fuchs, 2012) on web 2.0. Since prosumers are not paid a wage for the 'work' they do on social media, according to Fuchs (2012, 714) "all online time on corporate social media…is surplus labour time." At its heart, this is a political critique. As Fuchs puts it:

> …the victims of exploitation of surplus value in cases like Google, YouTube, MySpace, or Facebook are not merely those employed by these corporations for programming, updating, and maintaining the soft and hardware, performing marketing activities, and so on, but also the users and the produsers engaged in the production of user-generated content. (Fuchs, 2010, 191)

However, is such an argument both analytically and politically tenable? In the chapter that follows, I will argue that this conception of labour conflates a number of rather different practices and suffers from a lack of analytical rigour. What is more, the so-called 'data commodity', it will be argued, is in fact a 'fictitious commodity' which generates economic value not from the labour of prosumers but rather through its role in facilitating rent extraction. The argument that I will subsequently develop is that the packaging of audience/user data in the *form* of a commodity allows media capitalists – including the owners of music streaming services - to extract rent from advertisers in exchange for access to 'media space'.

## Chapter 3: Critique of the Listener-as-Prosumer/Data Commodity

Public/private, individual/society, active/passive, labour/leisure: binary oppositions shape and stabilize our most cherished and taken-for-granted truths. Music listening clearly has a home under this mode of differentiation. It belongs with other pleasurable forms of leisure, such as watching television or reading a novel. It is a refuge from the world of toil and sacrifice, an escape from the 'reality' of material limitations and deprivations.

It is for this very reason that the term "labour" sounds so counter-intuitive when applied to describe any form of media consumption. This is particularly so when it comes to music listening, due to the supposed passivity of listening, as discussed in the previous chapter. The concept of "audience labour" delivers a jarring shot to common sense, and this, I would argue, is the reason it both attracts and repels. For proponents of the "audience labour" thesis, capitalism is a virus, constantly mutating to better adapt to changing historical conditions. That a leisure activity may in fact be a disguised instance of value-producing labour is simply further evidence of the dynamism of capitalism. On the other side, critics cling to islands of experience not yet fully submerged by the waters of historical materialism. Must we reduce everything to brute economics? Should we dismiss the pleasure audiences and media users derive from consuming and prosuming?

In this chapter, I will try to navigate between these two mutually opposed camps. I argue that listeners on music streaming services - like social media 'prosumers' - do not directly produce value. Thus, the Marxist inflection of the concept of 'labour' in this context may be misplaced. At the same time, it is a mistake to describe listening and

listener actions on music streaming services as 'merely' instances of leisure, with the implication that they are of no concern to political economists. The argument we will be building towards is that while listeners do not produce 'value' in the Marxist sense, they do contribute to the production of 'something' and this 'something' is the key to understanding the political economy of music streaming services.

**Leisure as/or Labour?**

As our earlier discussion of Fuchs and Terranova revealed, both critical media scholars influenced by Dallas Smythe and autonomist Marxists argue that it is no longer possible to distinguish between work and nonwork. Indeed, Smythe (1981, 270, as cited in Caraway 2015, 3), considered the idea that leisure time could be conceived of outside and independent of work time as "ridiculous".

The choice to gather audience practices as distinct as television viewing, radio listening, or social media posting, under the umbrella term of 'labour' is certainly not an innocent decision however. Doing so provides the grounds for developing a political critique of the "free" ad-supported media economy. Reflecting on her decision to employ the term 'free labor' to describe user practices on the Internet back in 2000, Tiziana Terranova (2012, 52-53) recently wrote: "[c]alling users' participation in the digital economy labor was not so much an empirical description of an undisputable social and economic reality, but a political choice." It is a political choice because 'labour', in the Marxist tradition, is the source of surplus value and the site of exploitation within capitalism.

However, can something as enjoyable as sharing your favorite band with your friends, simultaneously involve relations of exploitation? The resistance to such an argument seems understandable. In an examination of the Swedish independent music scene, Baym and Burnett (2009) discuss the role of fans as "gatekeepers, filters, and influencers" (ibid. 445). They celebrate these amateur practices, and demarcate between what they call "labours of love" and exploitation:

> To argue this is exploitation, one must assume that the rewards that fans attain are less valuable than those they deserve, and that the fans' perceptions of their practices are evidence that they have been seduced by the power dynamic that exploits them. We are loathe to dismiss their claims of affective pleasure and the desire they feel to spread what brings them joy as evidence of exploitation. (ibid. 446)

To bring the discussion more squarely back to online music streaming – let us consider fan practices of social tagging described in the previous chapter. I argued then that we might conceive of 'tagging' as a form of labour - specifically what Maurizio Lazzarato calls 'immaterial labour': "the labor that produces the informational and cultural content of the commodity" (1996: 133). But do music fans who engage in tagging see it this way? What do they get from this 'free labour'? According to Paul Lamere (2008, 103):

> Tagging an item enrols an individual into a social circle. When an individual applies a tag, they can see other people who have used the tag, and the items that they have tagged. The social experience can be enjoyable, leading people to continue to tag more items.

Taggers describe the experience of tagging as pleasurable, Lamere goes on to explain. It thus appears that 'taggers' are receiving non-monetary forms of compensation for their 'immaterial labour'.

Such accounts of online practices that take seriously the experiences of users are,

of course, indispensable. Nevertheless, we can see the limitations to this type of approach in Baym and Burnett's assessment that "exploitation and just reward are matters of perception" (ibid., 445). While exploitation may be in the eye of the beholder when "exploitation" is used in the common sense, everyday usage, this is certainly not true of any Marxian-derived definition of exploitation. Marx's labour theory of value allows for a precise and measurable definition of exploitation in capitalist society. Exploitation, for Marx, is not a moral or subjective judgment; it is a structural relation inherent to capitalist production. One may or may not experience pleasure while being exploited. This is beside the point. It is not the experience that defines exploitation but rather the accumulation of surplus value. As Mark Andrejevic (2013, 153) puts it "[t]he critique of exploitation does not devalue individual pleasure any more than such pleasures nullify exploitative social relations."

The key to solving the riddle of whether or not listeners on streaming services perform labour, is not to ascertain whether 'pleasure' or 'enjoyment' is present, but instead to examine whether such practices are a source of surplus value. If it can be established that surplus value is generated through the act of providing personal information when registering for a streaming service, or by tagging a song, streaming a playlist, or sharing a favorite band, then it makes sense to deem such acts as 'labour' in the Marxist sense of the term. As Arvidsson and Colleoni (2012, 136) put it in relation to social media 'prosumption', to move beyond speaking of "labour" in colloquial terms, "…we must also show that [prosumers'] contribution to the overall value of, say, Facebook can be understood in the more rigorous terms of the Marxian labor theory of

value. If this is not possible, then we might as well choose to use a different perspective, with different political implications."

In order to investigate whether we can analytically claim that listeners produce surplus value for music streaming services, we will take Christian Fuchs' development of the 'prosumer commodity' as our basis for critique. We do so because Fuchs's prolific writings have been the most prominent example of the fusion of Italian 'autonomist' theory and Dallas Smythe's theory of "the audience commodity". Fuchs mobilizes these influences in order to argue for the relevance of applying Marx's labour theory of value to prosumer practices on the web in general. In the previous chapter, I suggested that this was an interesting argument that could potentially offer insight into the political economy of the emergent music streaming sector. By constructing playlists and programming 'flow', tagging music, and sharing music through social networks, music streaming listeners - like the more common example of social media users - could be considered exploited 'prosumers' who produce value for music streaming services.

As discussed already, Fuchs argues that internet users produce value and surplus value in two ways. First, by paying attention to ads, social media users, like mass media audiences, produce surplus value for media corporations. However, unlike mass media audiences, social media users also produce an additional service by creating the very content they consume. According to Fuchs, such "informational content" (ex. status updates, personal data, playlists, etc) is productive of value because it is sold as a commodity to advertisers. Let us now analytically deconstruct these two ways of supposed prosumer value production in order.

**Problematizing Audience Value Production**

Extending to social media Jhally and Livant's (1986) mass media-focused model, Fuchs argues that time is the measure of the value created through social media.

> If 500 million people use a corporate platform that is funded by targeted advertising for an average of 90 hours a year (which is on average 15 minutes a day), then the value created is 45 billion hours of digital labour. All of this online time is monitored and creates a traffic commodity that is offered for sale to advertisers, none of the time is paid. 90 billion hours of work are therefore exploited.[46] (Fuchs, 2012, 635-636)

Recall that Jhally and Livant (1986, 132) argued that the act of watching television ads produces surplus value which is transformed into the profit earned by "the owners of the means of communication, the networks or the local broadcasters." In reference to Marx's analytical distinction between necessary labour time and surplus labour time, Jhally and Livant proposed necessary watching time as time when viewers watch the programs they enjoy, while surplus watching time - which produces surplus value - occurs during the 'work' of watching ads.[47] In other words, Jhally and Livant argued that by transposing Marx's labour theory of value to the media sector, time spent viewing ads could be quantitatively related to media revenues.

Let us look more closely at the ad-supported media economy in general to see if this approximate correspondence exists. Assuming for a moment that the simple act of

[46] Fuchs (2010, 188) also argues that since prosumers are not paid for the surplus value they generate this indicates that "the rate of exploitation is infinite".

[47] I will set aside for now discussion of the serious analytical problems presented in the original blindspot formulation. Readers interested in a thorough critique of Smythe, and Jhally and Livant's application of Marxist concepts should see Comor (2014, 2015).

reading, viewing, or listening to an ad can be construed as 'labour', it seems logical to estimate that roughly the same 'attention time' would be expended on a similar ad, regardless of who the 'labourer' is or where such 'labour' is taking place. In Marxist terms, we could say that it would require the same amount of abstract social labour. From this it follows that if we want to claim that the audience 'labours', then one thousand readers of a particular newspaper ad, for example, should produce equivalent value – and thus carry an equivalent price - regardless of what newspaper their 'audience labour' takes place in.[48] However, as Rigi and Prey (2015) demonstrate, Cost Per Thousand (CPT) or Cost Per Mille (CPM) varies dramatically across and within all media. For example, the cost of 'purchasing' one thousand 'labouring' readers for a standard black and white ad in *The Stockton Record* is 15.3 times higher than in *USA Today*. When we compare CPT/CPM rates online, we see that the average CPM of online newspapers ($6.99 US) is 12.48 times higher than the average CPM of social networking sites ($0.56).

What are we to make of such dramatic variations in CPT/CPM? If audiences

[48] Careful readers will immediately raise an objection. For Marx, 'price' is not a synonym for 'value', (as it has since become in neoclassical economic theory). Under capitalism, commodities are sold not at their values but at their prices. We can think of the relation between labor-time (value) and money (price) as that of essence and appearance. Value has no independent empirical existence and can only be expressed empirically through price. As Marx wrote: "[m]oney as a measure of value is the necessary form of appearance of the measure of value which is imminent in commodities, namely labor-time" (Marx, 1876:188). I do not intend to get mired in the complexities of the so-called "transformation problem" here. Suffice to say, there is an approximate correspondence between value and price, according to Marx. Thus, we can approximately compare values through comparing corresponding prices. See Rigi and Prey (2015) for a more detailed explanation.

produce value, then why would one thousand readers of *The Stockton Record* produce 15.3 times more value than the same number of *USA Today* readers? Or, why should the same number of visitors to newspaper sites on the internet produce 12.48 times more value than do "prosumers" on social networking sites?

The lack of any correspondence between the time that users spend with ads and the prices of these ads makes it difficult to argue that anything like "surplus watching-time" is generating the value that is transformed into profits for commercial media owners, as Jhally and Livant (1986) argued. There has to be some correspondence between time and value for the labour theory of value to hold true. The only explanation is that audiences, or prosumers, are not engaged in value-producing labour when they read, watch, or listen to an ad. How could it be otherwise since the abstract labour needed to pay attention to any one page newspaper ad, any 30 second TV commercial, or any standard online banner ad, by one thousand readers/viewers, is equivalent?

Another problem was that Jhally and Livant built their model on Smythe's earlier assumption that time spent viewing television could be counted as 'attention time'. However, according to Arvidsson and Colleoni (2012, 143):

> Smythe's theory of the audience commodity was developed in an era dominated by television advertising where channels were few and the remote control was not yet a widely used device. It assumed—in the face of the audience studies that have come after Smythe's writings, not before him, to his defense—that the audience paid total attention both to the entertainment product that they consumed as "wage" and to the advertising that put their attention to work.

The advent of the remote control shattered any assumption that viewers would actually pay attention to ads.[49] Today, we would be hard pressed to make the case that time spent online is equal to attention time. As websites proliferated and users fragmented, gauging audience attention by counting simple page views, or 'hits', became an obsolete practice. Instead, click-through rates (CTR) became widely employed. This measure, however weak, at least provided evidence of user engagement. Today, as mobile devices have increasingly become a preferred means through which to access the web in general, and music streaming services in particular, CTR has become a less useful metric. For example, listeners accessing a music streaming service from a mobile device are about half as likely to click on ads as those who listen on their computer (Jablonski 2011). One result, for example, is that streaming services have attempted to shift from displaying banner ads to playing more audio ads. In place of click-through metrics, solutions such as hands-free, voice activated engagement ads have been developed.[50]

The key point is, as Frederik Bermejo (2009, 144) points out, "aspects of the audience *other than exposure* are now more important metrics in our highly interactive media environment." Thus, rather than a reliance on 'time' as a gauge for measurement, we have increasingly seen the employment of "performance models" (ibid.) of measuring audiences/users. In this so-called "like economy" (Gerlitz & Helmond 2011), the major

[49] Even Jhally and Livant (1986, 138) point to a 1984 report that foretells a dramatic decrease in the percentage of audiences that will remain tuned in during commercial breaks.
[50] For example, the company XAPPmedia provides interactive audio ads that allow listeners to verbally respond to advertised offers.

determinant of attention is the direct engagement of users. Such engagement is measured through "social buttons" such as Facebook's "like" button, Pandora's 'thumbs' or Twitter`s "retweet" button. Through social buttons, direct engagement becomes a more significant factor for the measuring of attention than time spent online.[51] As Bermejo (2009, 144) concludes, "when the pricing models currently used in online advertising are examined…none of them seem to take into account time as a criterion for setting prices."

Of course, time spent on a particular site or online service remains a key metric of interest to advertisers.[52] However, to claim that publishers and advertisers are interested in determining precisely how much time their 'audiences' spend on their sites, is a very different claim (with very different political economic implications) than the claims made by Fuchs (2012) or Jhally and Livant (1986) that time spent online, or time spent viewing television commercials, can be quantitatively related to media revenues.

It thus appears that Marx's labour theory of value – whereby the exchange value of a product/service is related to the quantity of socially necessary labour time needed for its production - is difficult to apply to the "audience commodity". Instead, the wide variations we find in CPT/CPM appear to be more closely related to the particular

[51] Following Gerlitz & Helmond (2011), Arvidson and Colleoni (2012: 141-144) identify four regimes of pricing in relation to advertising on the internet: the 'hit', the 'click', the 'link' and the 'like' economies. Of these four, only with the 'hit economy' does time, they claim, correspond to the price of advertising space. Since the determination of the price of advertising on contemporary social media is dominated by the other three regimes, there is no direct relation between time spent on social media and the price of an ad.
[52] For example, Triton Digital's Webcast Metrics, the industry standard for digital audio listening measurement, lists Time Spent Listening (TSL), Total Listening Hours (TLH), and Average Time Spent Listening (ATSL) amongst several metrics it employs.

demographics or socio-cultural background of media audiences/users. In other words, advertising revenues are dependent on the projected profile of those exposed to the ads. Class, gender, generation, race, national differences and corresponding cultural habituses, among others, are all major aspects of audience profiles.[53]

Nevertheless, while the argument above may be sufficient to problematize the traditional "audience commodity" thesis proposed by Smythe, and further developed by Jhally and Livant, could we not say that 'prosumers' online are engaged in the production of another commodity? Recall that central to Christian Fuchs' (2010, 2012) updating of the audience commodity is his argument that social media users produce "informational content" (ex. status updates, personal data) which is appropriated and sold as commodities by social media. For Fuchs and those who share his position, it is the unpaid labour of prosumers that creates the exchange value of the informational content that is sold, the magnitude of which is determined by labour time. "The more time a user spends on Facebook the more data is generated about him/her that is offered as a commodity to advertising clients" (Fuchs, 2012, 639). It is to a critique of this argument that we now turn.

[53] The fact that the number and profile of the audience influences how much money these services make creates the illusion that the audience itself is the source of value. We could call this "audience fetishism", a particular manifestation of commodity fetishism. As Richard Maxwell (1991, 31) pointed out in an insightful critique of the audience commodity thesis, "[b]ecause the audience carries a price and can be bought and sold for profit, it appears as though money grows out of watching; in this way it assumes the *form* of a commodity" (emphasis added).

**Personal Data as Fictitious Commodity**

From Twitter comments to Facebook 'likes', as we travel through cyberspace we leave behind a trail of digital footprints. The mining, storage and evaluation of personal data underlies the business models of most web 2.0 platforms. In the previous chapter, I detailed the importance of personal data to the business models of music streaming services such as Pandora Internet Radio. There is a growing market for such data. For instance, the data management firm BlueKai sells 50 million pieces of information each day about specific individuals' browsing habits, for as little as a tenth of a cent apiece (Angwin, 2010).

However, it is one thing to claim that data is central to a company's business model. It is another thing to claim that data is a commodity produced by audiences/users. To make such a claim is to misunderstand the Marxist sense of what it means to be a commodity. Just because something can be bought and sold does not mean that it is a commodity (see Huws 2014). As Bob Jessop explains, "A commodity is a good or service that is actively produced for sale in a labour process" (Jessop, 2007, 118). Certain objects can have prices without being the product of social labour (a painting, for example) or they may not be the product of labour at all (virgin land, shares in the stock market). We could say that such objects have a price but no value.[54]

[54] While something with no exchange value can have a price, something without a price has no exchange value, even if it is the product of labour. Price is a condition for the existence of exchange value. Products of labour which are not sold on the market have no exchange value because they are not commodities.

Sure, data take the *form* of a commodity as it can be bought and sold, but markers of identity (name, age, gender) are not *produced* by users, in a labour process, in order to be sold.[55] Both personal data and the audience or prosumer commodity replicate the commodity form, without actually being commodities.[56] Instead, we might more accurately conceive of data as a 'fictitious commodity'. Fictitious commodities either already exist before they acquire the form of an exchange value (ie. land) or they are initially produced as a use value before being appropriated and put on the market for sale (ie. a folk song). Marx acknowledged the existence of such 'fictitious commodities' in Volume One of *Capital*:

> Things which in and for themselves are not commodities…can be offered for sale by their holders, and thus acquire, the form of commodities through their price. Hence a thing can, formally speaking, have a price without having a value. The expression of price is in this case imaginary… (Marx 1976, 197).

The personal data that users provide when they open a Pandora Internet Radio account, for example, has a use value before being appropriated and packaged as data. Therefore, it is incorrect to claim that Pandora users 'labour' to produce such data for Pandora. As Bob Jessop (2007, 118-119) writes:

> …in contrast to a capitalist commodity, a fictitious commodity is not created in a profit-oriented labor process subject to the competitive pressures of market forces

[55] As recorded in the *Oxford English Dictionary*, with origins in mid-18th Century Latin, 'datum' is literally 'something given' (neuter past participle of *dare*, meaning 'give'). While 'something taken' may be a more accurate description when referring to contemporary data mining practices, the point remains; data are not produced by internet users.

[56] Labeling something a fictitious commodity does not at all mean that it, or the market that develops around it, is unimportant or not central to capitalism. Just the contrary: we can look at the fictitious commodity market of the stock market as the most obvious proof of this point.

> to rationalize its production and reduce the turnover time of invested capital.…In this sense, a fictitious commodity belongs to the broader spectrum of "quasi-commodities" that have a price but otherwise fail to meet one or more of the criteria for a full capitalist commodity.

To paraphrase Jessop then, we can say that while personal data may indeed have a price, it is not produced in a profit-oriented labour process, and thus has no value. Instead, it is "a gift of [human] nature or another 'aspect of man'" (in Jessop 2007, 117).

What is more, individual units of data or personal information do not even have much *use* value. As Oscar Gandy Jr. (2011) has demonstrated in his investigation of markets for personal information, it is somewhat of a fool's mission to attempt to determine the 'value' of any one "unit" of data - such as one's name, gender, or favorite band. Instead, it is the aggregation of such data into profiles, and the relationships between profiles, that marketers are interested in. As Gandy puts it, "value is not associated with specific information about an individual" instead, personal information in the data market, for the most part "is sold on the basis of information that facilitates the characterization of an individual as a member of a valued segment." While the social media user, or music streaming listener, may provide the data, they certainly do not produce the segment.

Perhaps one source of the problem is the 'mining' metaphor itself. It gives the impression that data, like oil or gold, exists somewhere beneath the surface, waiting to be extracted. Not only is 'raw data' an oxymoron (Gitelman 2013) but the act of generating meaning from large data sets is "an intrinsically interpretative act" (van Dijck 2014, 202). The same data may generate very different patterns depending on who is interpreting the results and what they are looking for. "Correlations", as van Dijck (ibid, 201) writes, "do

not simply ‘emerge’. They are much rather induced by an implicit question framing the inquiry.”

> Automated data extraction performed on huge piles of metadata generated by social media platforms reveals no more information about specific human behavior than large quantities of sea water yield information about pollution – unless you interpret these data using specific analytical methods guided by a focused query. (ibid)

Thus, the labour necessary to give data both value and use value appears to take place not at the point of ‘prosumption’, but elsewhere.

**The ‘Ratings Commodity’**

What if we instead argue that this supposed ‘data commodity’ is not produced by ‘prosumers’ but rather by workers at ratings firms, or internet measurement companies, like Nielsen, Arbitron, or Comscore? Ratings and measurement companies ‘refine’ personal data into a marketable product: in industry terms, turning ‘raw’ or ‘unstructured data’ (hereafter ‘data’) into ‘structured data’ (hereafter ‘information’) that can be easily packaged and sold back to media and advertisers. Then we can no longer claim that this data is a ‘fictitious commodity’, right? For if something is produced by waged labourers within the labour process then it constitutes a true capitalist commodity.

In taking this perspective, we would be following an influential argument first made by Eileen Meehan (1984, 1993). Meehan agreed with Smythe, and Jhally and Livant, that the political economy of communication must move beyond messages in the hunt for the commodity produced by commercial media. However, Meehan argued that it is not audiences (understood as ‘people’) but rather information about these people –

ratings – that constituted the central commodity produced by the media.[57]

By arguing that "neither messages nor audiences are exchanged; only ratings", Meehan (1984, 223) flips the audience commodity thesis on its head. Instead of the audience working for industry or the media, audiences are the raw material *worked upon* by the ratings industry. As Meehan pointed out, ratings are not simply reports of human behavior, they are products. Instead of seeing the ratings industry as an industry that produces research, Meehan sees it as an industry that produces a commodity. According to her, Smythe, Jhally and Livant "confused the statistical aggregate with the social subjects who watch (or read or listen to) specific media texts..." (ibid, 801). Or to use Philip Napoli's (2003) useful distinction, they confused the 'measured audience' with the 'actual audience'.

Thus, it is not audiences or prosumers, but rather the statisticians and analysts employed by ratings and measurement companies like Nielsen, Arbitron, and Comscore, who labour to produce the data commodity (see also Caraway, 2015).[58] However, we encounter another serious problem in applying the labour theory of value to the wage

[57] Meehan's contribution is especially important, in light of the present project, because it highlights the critical role of measurement. Measurement, and the struggle over the standardization of metrics is, if anything, even more important in our new media world. True, web 2.0 permits publishers to collect their own data. In other words, audience metrics, through the use of cookies and other monitoring devices can be moved in-house. Yet most advertiser-supported internet companies outsource ratings/metrics to 3rd party services for the simple fact that potential advertisers need to trust this data. They require an independent third party to verify it.

[58] However, in an extended footnote in her dissertation, it also appears that Meehan accepts the idea that audiences provide the "free labour" that contributes significantly to the value of the 'ratings commodity'. See Meehan, 1983, 25 *n*12.

labour performed by ratings and measurement firms. While the initial collection and processing of data into information may require large amounts of labour time and expense, such information requires almost no labour-time to be reproduced. In an era of digital reproduction, once produced, information can be reproduced infinitely at little extra cost.[59] The "information commodity" thus, differs drastically from physical goods and most services, where - all conditions being equal - the cost and time spent on the reproduction of the commodity is equal to that spent on its production.[60] The cost of the reproduction of a car, for example, is equal to the cost of its production.

As Marx put it however, it is the social labour time required to *reproduce* – not produce – a commodity that determines its value:

> …a large part of the existing capital is always being more or less devalued in the course of the reproduction process, since the value of commodities is determined not by the labour-time originally taken by their production, but rather by the labour-time that their reproduction takes, and this steadily decreases as the social productivity of labour develops. (Marx, 1981, 522) (emphasis added)

[59] Consider for example a piece of information 'K' and the time spent on its production 'tK'. If we make M additional digital copies of K, the average time spent on producing a single copy is (t) = tK/M+1. I do not include the time spent on copying this information in the equation because it is assumed that such time is negligible. With the increase of M, (t) will decrease. For instance, if the original time spent on the production of software is 100 hours and if the software is copied digitally by 99,999 users, the time spent on each copy will be 1/1000 hour, or 3.6 seconds. For 999,999 users, (t) will be 0.36 seconds, and for 9,999,999 users it will be 0.036. Although mathematically 3.6, 0.36, and 0.036 are values, economically they can be considered equal to zero. (see Rigi & Prey, 2015)

[60] For most material goods an increase in the volume of production decreases the cost of fixed capital per unit of the commodity. The reduction of fixed capital occurs piecemeal (the greater the number of units of commodities the less the share of fixed capital in each unit). However, the cost of labour and raw materials, other conditions being equal, does not decrease with an increase in the volume of production. Therefore, the value of such commodities never tends towards zero as its lower limit is the cost of raw materials plus the value the labour adds to this cost. However, the digital reproduction of information follows a different rule. The cost of the first digital copy already approaches zero.

Input factors which go into the initial collection and processing of data may contain significant value, but while the produced information has high use value, it contains little value. This is a contradiction that lies at the heart of the capitalist mode of production. According to Marx (1976) exchange value and use value have an antagonistic relation. The first represents the private interests of capitalists and the second the collective interests of members of society. With information, this contradiction takes its most radical form. Information is a public good: it can exist everywhere simultaneously, is non-excludable and non-rivalrous (its use does not deplete its use value). With information, use value annihilates exchange value, i.e, the capitalist form of production and its abstract value factors.

Marx strongly criticized the all-too-common view that economic value was an inherent or immanent quality of a valuable good instead of the outcome of a historically contingent social process and specific social relations. He would no doubt concur with Dan Schiller, who reminds us that knowledge or information "is not inherently valuable but that a profound social reorganization is required to turn it into something valuable" (Schiller, 1988, 32). Thus, the question becomes; under what conditions does personal data take on the *form* of a commodity? In other words, how can it justify its price? As Jessop (2007, 120) puts it, once this question is asked we must conclude that "[information] only acquires a commodity form insofar as it is made artificially scarce and access thereto depends on payment of rent."

Meehan acknowledges this when she discusses how one of the central problems faced by ratings companies is that their primary commodity is an information commodity

that quickly loses exchange value unless it is protected and kept artificially scarce. In her doctoral dissertation she discusses in great detail how companies like AC Nielsen protect their monopoly through patents etc. Indeed, such is the case with all 'information economy' industries in an era of digital reproduction.

This is where music streaming services come into the picture. Music streaming is a prime example of the capitalist solution to the problem of digital music as an infinitely reproducible 'public good'. In other words, in an era of digital reproduction and internet, music has become an information commodity, with high use value but little value. Digital rights management (DRM) locks and subscription services are the music industry's response to these new economics. In economic parlance, they represent the transformation of a 'public good' into a 'club good'. Rotta and Teixeira (2012, 455) are speaking of information, or 'knowledge commodities' in general but they may as well be speaking of digital music in the streaming era when they write: "They will no longer be sold but only loaned. The "buyer" (actually a borrower) will only have the right of use, not of ownership. …the consumer becomes only a user, not the owner of the knowledge-commodity."

**Conclusion: Towards an Alternative Materialist Theory**

In this chapter, we have reviewed Marx's labour theory of value and assessed its applicability to digital 'prosumption'. We have critically analyzed such applications and demonstrated that neither mass media audiences, nor internet users, can be said to produce surplus value directly. What is more, in terms of the Marxian understanding of

commodities, the 'data commodity' supposedly produced by prosumers, was shown to be a 'fictitious commodity', which has a price without having value.

The claim that audiences or users directly 'labour' to produce surplus value is the result of what Edward Comor (2014, 246) regards as "simplified, generalized, or incorrect readings of Marx's foundational conceptualization of value." More precisely, it fails to grasp value creation as "a process involving both the mobilization of concrete and abstract labor" (Comor, 2015, 16). In other words, even if we were to accept the conflation of labour time with leisure time, we would still need to inquire into the *type* of labour that is conducted when we consume media.

The analytical distinction Marx made between "concrete labour" and "abstract labour" – what he called the 'two-fold nature of labour' – was central to Marx's critique of capitalism. Indeed, he called this distinction "the pivot on which a clear comprehension of Political Economy turns" (Marx 1965: 41 in Holloway 2010, 912). "Concrete labour", understood as a particular activity which produces 'use value' - is profoundly different from "abstract labour" – the labour that produces value. Human beings have always and everywhere engaged in "concrete labour" - particular activities that have specific useful effects. "Abstract labour" however, is labour that is alienated from a particular goal. It is a historical form that emerged when industry required labour-power to be separated from the worker; stripped to its bare features and thus made divisible and measurable so that it could be most efficiently inserted into the industrial process. What is specific to capitalism is the practice of purchasing a worker's "labour power" and then paying her less than the value of what her "abstract labour" produces.

This is the paradigmatic form for producing value under capitalism, and contrary to pronouncements of the "social factory" the dominance of 'wage slavery' has only increased since Marx's day (Camfield, 2007; Huws, 2014, Rigi, 2015).

A useful analogy may be to think of social media sites as gardens – barren and bleak until amateur prosumer gardeners arrive to fertilize the soil with their comments, playlists and personal data. Suppose I agree to help my friend plant a flower garden in her front yard. Even if she does not sell the flowers, my friend might benefit economically in other ways from my 'concrete labour'. My friend certainly saves some money in asking me to help her rather than hiring a professional gardener. What is more, in beautifying her property, my 'concrete labour' may contribute to increasing the value of her home. My friend may even be able to charge extra for the basement garden suite she rents out to a student.

As an instance of domestic 'concrete labour', such garden work may be considered "unproductive" in the strict Marxist sense of the term, but it is certainly not "unproductive" in any practical sense. Concrete labour is always implicated in, and essential to, the process of value creation, even if it is not *directly* productive of value.[61] Indeed, capitalism depends on the relation that exists between concrete and abstract

[61] In a refreshingly clear explanation of this distinction, Ursala Huws (2014) refers to labour "inside the knot" and "outside the knot". She gives the example of booking one's own holiday online. While this may be reasonably called 'productive' labour, for Huws it exists "outside the knot". However, a paid travel agent doing the same activity performs labour that is "inside the knot" because its "relationship to capital is both direct, and actually, or potentially, contested" (ibid, 94).

labour. Just as "free labour" in the home can curb demand for a wage increase at the office, social media and streaming services are able to extract greater 'relative surplus value' from waged employees who need not produce or program content anymore.[62] As we will subsequently see, the data collected from user engagement also allows such services to extract greater rents from advertisers. Thus, music streaming listeners building playlists or social media users posting comments provide a critical economic service, but they do not *directly* create value in the Marxian sense.

There are political problems that go along with the analytical sloppiness of failing to distinguish between concrete and abstract labour. To argue that we are all performing value producing labour as we update our statuses or build playlists, risks diverting attention from, and obscuring the fact that "[d]igital labor in the overdeveloped world is contingent upon the sweat of exploited labor (particularly) in countries such as China" (Sholz, 2012, 3). What is more, the desire to subsume almost all human activity under umbrella category of labour also conflates the well-known ontological distinction between labour and action.[63] If everything becomes an instance of 'labour', not only do we lose the distinctiveness of the wage labour relationship, but importantly, we also lose any space outside of Capital for human action (see Hesmondalgh, 2010, 280). If

[62] As Caraway (2015, 14) explains "user-generated content is implicated in value-creation only to the extent that by keeping down costs, it increases surplus value by making the imposition of more waged labor possible."
[63] Take, for example, Aristotle's distinction between 'action' and 'labour'. According to Aristotle, a master can compel a slave to labour, but action cannot be compelled by masters.

everything is labour then nothing is labour because labour is life: "its definition serves no analytical or political function anymore" (Merrifield, 2011). In turn, what was initially meant to fulfill a political purpose becomes instead a political liability.[64] As Ursala Huws (2014, 1010-102) wisely points out:

> …an analysis that equates a common exploitation with an identical role in the generation of surplus value, and collapses all these separate positions into a common collective identity as a 'multitude' makes it impossible to identify the point of production: the point where workers have the power to challenge capital…"

In *Crack Capitalism,* (2010) John Hollaway suggests that we use the terms "concrete doing" and "abstract labour" to more clearly mark the distinction between Marx's "two-fold nature of labour". Whether helping a friend in her garden, making a Youtube fan video, or remixing a track on SoundCloud, "concrete doing" can facilitate processes of identity construction and community-building. The battle should not be waged against "concrete doing" thus, but rather on its capture by capital. Capture may occur through processes of real or formal subsumption, or – as in the case of gentrification – through increased property value. The former involves labour and the production of value while the latter usually involves the extraction of rents. As our gardening example reminds us, while labour is the source of value, there are many ways for capitalists to make money that do not necessarily require the direct exploitation of labour (see also Jin and Feenberg

[64] Arguments that contemporary capitalism has superseded the factory walls also give too much credit to capitalism. Can 'surplus value' really be produced so easily, everywhere, by everyone, at anytime? Real-existing capitalism appears to be much more prone to crisis than such portrayals seems to allow for.

2015, 57).[65]

Alongside this misunderstanding of Marx's value theory there is a more general methodological misstep that contributes to analytical weakness in the work of Smythe, Jhally & Livant, and Fuchs. If we want to use Marx's tools of analysis to understand the political economy of media and communication we have to first start with Marx's method. Marx argued that one of the tasks of science is to avoid being distracted by what things appear like on the surface. As Lebowitz writes:

> Marx insisted on the necessity to begin by considering capital-in-general abstractly rather than relying upon the way things appear to the real actors. That is what Marx meant by science-in contrast to the perspective of "vulgar economy" which begins from appearances. (Lebowitz 1986, 170)

The strength and brilliance of Marx's analysis of capitalism has always been his insistence on studying capital in general - capital in the abstract - as it moved through its necessary circuits. Only after doing this did he explore how different industries related to each other and competed with each other. (ibid., 167-68).

The problems begin, I argue, when one starts with the media, rather than by first locating commercial media within the overall circuit of capital. Fuchs and others who argue that media audiences and 'prosumers' produce surplus value, apply Marxist categories of labour, surplus value, and exploitation to one part of the overall capitalist economy - the media sector. In doing so, media-capital is artificially isolated from

[65] Rent, trade and the generation of surplus value through commodity production are the three main ways that any enterprise can make a profit. While the first two predated capitalism, as Huws (2014) reminds us, they remain central to contemporary profit generation.

capital-in-general. While it is understandable and encouraging that critical political economists of communication want to study (new) media from a Marxist perspective, the starting point *must* always be capital-in-general, not media-capital. To start with, the media-sector is to completely reject Marx's method.

If we truly wish to understand the political economy of media we need to locate media within the circuit of capital; to determine how media industries contribute to the production and realization of surplus value within the *overall* capitalist economy. When you begin from the perspective of capital-in-general, it becomes clear that advertiser-supported media is providing a service to capitalists. Capitalists produce commodities and "every moment those commodities remain unsold is a cost to capital" (Lebowitz 1986, 168). Media capitalists provide the service of reducing the circulation time of commodities, by giving capitalists that produce commodities access to audiences, who are potential customers. If some of these audience members purchase the goods being advertised, then they are helping in the realization of surplus value. In other words, instead of doing the work to *produce* surplus value, media audiences (can potentially) help *realize* surplus value.

Without consumption, there is no value. "We don't just buy things," as Maxwell (2001, 12) puts it, "we make the system run." Production and consumption are two sides of the same coin. This simple point forms the foundation of Marx's economics and serves to remind us of the central role of media in facilitating the circuit of capital. In short, distorting the role of audiences/users by claiming that they produce value is both analytically flawed and unnecessary. Unnecessary because there is no need to argue that

the audience 'labours', and produces 'value', in order to emphasize the importance of the media sector, and media audiences, to contemporary capitalism.[66]

When one takes the perspective of capital-in-general, it becomes clear that the development of new ad-supported media forms and technology is driven by competition among media-capitalists. Each tries to demonstrate that they can do the best job of reducing the circulation time of capital. For example, currently there is a heated battle between traditional radio and internet radio for advertising dollars. Internet radio can collect much more precise information about its listeners. An exclusive luxury brand, for example, does not have to waste time and money advertising to lower income consumers. It can target only those listeners who live in a wealthy neighborhood with higher education etc. Now, of course, from the perspective of the media-capitalist – for example the internet radio owner – s/he does not see his or her job as being one of reducing the circulation time of capital. What the internet radio owner *thinks* s/he does is sell audiences to advertisers. "From the perspective of the individual media-capitalist, its profit is a direct function of its size (and demographic makeup) of (its) audience." (Lebowitz 1986, 169). Thus, "…it necessarily appears as if the media-capitalists in

[66] Smythe (1977), and more recently Fuchs (2015), are certainly wrong in their interpretation of Baran and Sweezy's classic text "Monopoly Capital" (1966). Baron and Sweezy do not diminish the importance of the sales effort and in turn, of communication, in the overall economy. Indeed, they saw it as one of capitalism's "decisive nerve centers" and argued that while advertising was only surpassed by militarism when considering its economic impact, "in all other aspects of social existence, its all-pervasive influence is second to none" (Baron and Sweezy 1966, 115). As this quote makes clear, Baron and Sweezy understood advertising to be involved in the realization rather than the production of surplus value, but this by no means diminishes its central importance to the maintenance of capitalism. A car may run on wheels but this does not negate the role of the axel.

competition sell consumers to industrial capital" (ibid).

This is precisely where Fuchs and proponents of the audience or prosumer commodity argument make their mistake. Their starting-point is the self-conception of the media-capitalists, not of capital-in-general. One could thus argue that they are conducting a media-centric political economy of the media. As Marx (1981, 428) wrote in the 3rd volume of *Capital*. "The ideas of a merchant, a stock-jobber or a banker are *necessarily* quite upside down." We can add 'media-capitalist' to Marx's list, but we should not add media scholars.

Smythe, and those inspired by him, are right to point out the increasing importance of media and communications industries, and the need for a critical materialist analysis of this sector. Smythe's "audience commodity" thesis forced political economists of communication to more closely examine the role of audiences in the economics of media. Smythe's central contribution, according to Vincent Mosco (2009, 137) is how he demonstrated that the media commodification process "brought together a triad that linked media companies, audiences, and advertisers in a set of reciprocal relationships."[67] However, in a rigorous critique of the audience commodity thesis, Comor (2014, 262) suggests that we should appreciate the "audience commodity" more for its metaphorical force rather than looking to it to provide any literal or analytical

[67] Mosco (ibid) goes on to point out: "The process of commodification thoroughly integrates the media industries into the total capitalist economy not primarily by creating ideologically saturated products but by producing audiences, *en masse* and in specific demographically desirable forms, for advertisers."

insight. In particular, Smythe's (1977, 5) analogy of the "free lunch" – media content that attract audiences in order to "cultivate a mood conducive to …advertisers' messages" – is highly suggestive for our purposes in understanding the role of music in attracting and 'affecting' listeners on ad-supported streaming services.

In the chapter that follows I will make the argument that the revenues that music streaming services extract from advertisers, or directly from subscribing listeners, can best be conceived of as a form of rent. Advertisers rent access to potential consumers; subscription-paying listeners rent access to the service itself. As mentioned earlier, the vast majority of streaming service users access music for free through ad-supported services. Ad-supported music streaming services thus replicate the economic model of broadcast radio, and television, from which Smythe developed his audience commodity theory. The argument that we will be subsequently developing is that advertiser-supported music streaming services sell not audiences, nor data, but rather lease access to particular segments of listeners.

As Harvey (2012) argues, rent, particularly 'knowledge rent' (Teixeira, & Rotta, 2008) has become a leading characteristic of contemporary capitalism. We will see how rent is the main form through which the digital music industry (as with software, film, and digital publication industries, etc.), extracts surplus from the rest of society.

## Chapter 4: Towards an Alternative Materialist Theory: The Media Space-Rent Economy

In this chapter, I develop an alternative materialist approach to describing the economic exchange between advertisers and music streaming services. My argument is that this exchange can best be described as one of rent for access. The question of precisely *what* advertisers are paying to access and *why* this should be of interest to critical media scholars, is an argument that I will develop below. First, however, since the economic category of rent is central to our argument, we will need to explore the Marxist theory of 'rent' in more theoretical detail. I will begin by critiquing a heterodox Marxist theory of rent that has received significant attention in recent years, in order to contrast it with Marx's own theory of rent.

### Cognitive Capitalism and the 'Becoming-Rent of Profit'

Autonomist Marxists and theorists of what has been called "Cognitive Capitalism" have given much attention to the concept of rent (see Hardt and Negri, 2009; Vercellone, 2010; Hardt, 2010; Marazzi, 2010). While the 'golden age' of industrial capitalism was characterized by what Keynes famously called the "euthanasia of the rentier", contemporary capitalism, as Vercellone (2010, 85) argues, is characterized by "a full-fledged comeback and proliferation of forms of rent". According to this school of thought, under cognitive capitalism rent is the new profit.

This is an interesting reading of post-Fordist capitalism. Vercellone acknowledges the challenge poised to the law of value by "fictitious commodities" (such as knowledge

and information), that are "non-rival, cumulative and difficultly *excludable*" (ibid., 111). However, in foregrounding the "becoming-rent of profit", Vercellone, like other autonomists, exaggerates the novelty of contemporary capitalism and obscures the relationship between rent and value. Marx's theory of rent is not separable from his theory of value and indeed must be understood as an essential component of his general theory of capital. As the great Russian Marxist economist Isaak Illich Rubin put it "[Marx's] theory of rent is derived from [his] theory of value" (Rubin, 1972, 46*n*1).[68] Rent is the extraction of surplus value from capitalists who have extracted it from wage-laborers. Thus, even though the category of rent "does not directly express relations between commodity producers through the products of their labor, it is nevertheless related to these relations and can be explained in terms of them" (ibid).

Vercellone's conception of rent shares very little with Marx's. First of all, it is excessively broad. Indeed, it appears that in Vercellone's formulation all revenue that does not directly emerge from the production process is considered rent. He claims that contemporary capitalists derive their revenues from property ownership and not from production because they no longer play an active role in the management of production. As a result, he argues that profit has metamorphosed into rent (Vercellone 2010). This is taken as proof of the increasing 'becoming-rent of profit', even though Marx (1981, 503)

[68] Indeed, as RA Walker (1975, 42) writes, Marx's rent theory was developed in order to "explain rent within the framework of his value theory and to refute previous theories which variously explained rent as cheating or interest on capital, or which abolished landed property made of land a source of value."

clearly demonstrates that the production of profit through labour exploitation occurs "whether [the capitalist] does this himself or has it done in his name by others."

As Rigi (2015) points out, Vercellone, along with other autonomists (ie. Hardt and Negri, 2009; Hardt, 2010; Marazzi, 2010) "conflate ground-rent, intellectual property rent, interest and a certain instance of profit of enterprise." Rigi (ibid) recognizes that this conflation is especially "evident from the fact that they consistently call revenues from financial capital 'rent' and barely mention interest". As Marx (1991, 460) himself put it, interest is "…a special title, for a part of the profit which the actually functioning capitalist has to pay to the capital's proprietor, instead of pocketing it himself." Interest is generated through the lending of money or property which incorporates value (Marx, 1981, 459-748). Rent, on the other hand, results from the capture of a portion of the overall surplus-value in return for access to, or use of value-less property (see Marx, 1991, 751-87). They are thus two different economic forms. Interest represents the commoditization of capital, while rent represents the commoditization of property.

I point the reader to Rigi (2015) for a more substantial critique of Vercellone et. al's claim that capitalist accumulation is increasingly fuelled by rent rather than profit. Suffice to say, while knowledge production is arguably hegemonic under contemporary capitalism, this does not mean that the production of value has declined. Indeed, just the opposite has occurred. With the incorporation of the formerly socialist world and the global expansion of capitalist production, (including the value-producing service sector), the production of value has greatly expanded in the post-Fordist era (see Rigi, ibid;

Camfield 2007). Thus, the very existence, and indeed growth, of value-absorbing sectors of economy is due to the concomitant growth of value-producing sectors.

In counterpoising rent to profit, Vercellone et. al. actually propose a very un-Marxist theory of rent. As Radhika Desai (2011, 218) polemically puts it:

> To speak of profit being replaced by rent is simply absurd. As Marx and the classical political economy of his time clearly saw, rent is, like interest, an unearned deduction from profit and can never exist independently of, let alone replace, the latter in a commodity producing society. The idea could only have occurred to those unfamiliar with Marx's economic analysis…

In order to avoid making the same mistake we turn now to an analysis of Marx's theory of rent.

**Marx's Theory of Rent: Absolute Rent, Differential Rent I, Differential Rent II, and Monopoly Rent**

In Volume III of *Capital*, Marx develops a sophisticated, if incomplete, theory of rent. According to Ernest Mandel (2003), "Marx's theory of rent is the most difficult part of his economic theory" and "has witnessed fewer comments and developments…than other major parts of his 'system'". In what follows, I briefly explain the most important points concerning Marx's theory of rent before we attempt to ascertain its relevancy for the ad-supported media economy, and the music streaming sector in particular.

I will focus my attention what is commonly called 'ground rent': "a particular form of rent based on land ownership" (Denis, 1982, 128). In Volume III of *Capital*, Marx draws a distinction between four types of ground rent: *absolute rent*, *differential rent I*, *differential rent II*, and *monopoly rent*. These categories have traditionally informed the Marxist analysis of rent as it relates to agricultural land, mines, building

lots, forests, fishing grounds, etc. Beginning with absolute rent, I will briefly explain all four categories in relation to agricultural production, as Marx did. In order to understand the basis for what follows, let us assume a fully capitalist agricultural system where land is owned by landowners and farmed by capitalist farmers who employ wage labourers. For simplicity sake, let us also follow Marx's assumption that demand for agricultural products slightly exceeds supply.

A distinguishing feature of (traditional) agricultural production in relation to industrial production is its relatively low ratio of capital invested in machinery and materials to capital invested in labour. This ratio is what Marx called the organic composition of capital (OCC) because it refers to the relationship between "living" and "dead" labour. Since only living labour can produce surplus value, and since agriculture (in Marx's day) employed many labourers, the agricultural sector produced relatively more surplus value than did capital-intensive industry. As a result, if capital were able to move freely to and from agriculture, the excess surplus value would flow to non-agricultural sectors and influence the general rate of profit. In turn, the rate of profit in agriculture and the market price of agricultural products would eventually decrease because the rate of profit "is adjusted to that of these average spheres where the average composition of capital prevails" (Marx 1981, 273). However, this does not happen. Investing capital in land requires the consent of landowners so land ownership acts as a barrier to the free flow of capital. Even land of the poorest quality, which remains in production because of overall demand for agricultural products, can be used to collect rent. Marx (1981) referred to this rent as "absolute rent" since it is not related to the

productivity of the land, but rather to the barriers erected by private property.

The productivity of agricultural land is however important in determining two other forms of rent: what Marx called ‘differential rent I’ and ‘differential rent II’. Clearly, there is a big difference in the natural fertility of land. All conditions being equal, the market price of soybeans, for instance, is determined by the cost it takes to produce a crop on the poorest soybean land.[69] Those soybean farmers fortunate enough to farm richer land make an excess profit which they must in part pass on to the landowner through higher rental rates, without this affecting the market price of soybeans. The excess rent is what Marx (1981) calls ‘differential rent I’.

The productivity of soybean farming, however, can also be increased through capital investment (ie. drainage). The extra rent land owners can extract from land made more profitable by capital investment is called ‘differential rent II’ by Marx (1981). As Denis (1982, 130) explains:

> Differential rent II depends on the intensity of production which itself depends on the investment of constant and variable capital. Yield on land of equal natural fertility and similar location will vary according to capital invested.

As with differential rent I, agricultural prices are not affected by the extraction of excess rent facilitated by capital investment. Instead, the two forms of differential rent described

[69] Denis (1982, 130) writes: “Marx's earlier assumption that demand for agricultural products slightly exceeds supply leads him to conclude that the land of worst quality in production determines market price, and that all other lands collect a differential rent. This is consistent with his earlier assumption that agriculture is capitalist so that land will be entered into or removed from production in direct response to demand fluctuations. Capitalist farmers who operate on soils of even less fertility than those determining market price will not obtain an average profit. Consequently they will invest their capital elsewhere.”

by Marx account for the relative distribution of surplus value amongst capitalist farmers and landowners.

We now arrive at the fourth and final form of rent analyzed by Marx: so-called "monopoly rent". Marx's theory of monopoly rent was never completed before his death, but Ben Fine (1979, 277 *n*14) suggests that "it would be defined in terms of the appropriation of surplus profits at the level of exchange *between* sectors rather than the appropriation of surplus profits as a result of their production *within* a sector" (emphasis added). Let us now examine what Fine means by this.

In order to extract monopoly rent, the rentier must have control over land, or another item, that is considered unique, highly desirable, and non-duplicable. As Jakob Rigi (2014, 921) explains, "[m]onopoly rent originates from a monopoly price which in its turn results from the fact that a commodity is construed as exclusive." In Volume III of *Capital,* Marx (1981, 910) gives the example of an exclusive vineyard:

> A vineyard bears a monopoly price if it produces wine which is of quite exceptional quality but can be produced only in a relatively small quantity. By virtue of this monopoly price, the wine-grower, whose excess over the value of his product is determined purely and simply by the wealth and the preference of fashionable wine-drinkers, can realize a substantial surplus profit. This surplus profit, which in this case flows from a monopoly price, is transformed into rent and accrues in the earth endowed with these special properties. Here, therefore, the monopoly price creates the rent.

In other words, the price of this vineyard is capitalized monopoly rent. A painting by Van Gogh or Picasso exhibits the same phenomenon (Harvey, 2009; Rigi, 2014).

As already alluded to, a crucial distinction separates monopoly rent from the other three forms of rent explained above. While the surplus value that is transformed into absolute rent - and both forms of differential rent - is produced through the wage labour

of agricultural workers, the surplus value that is transformed into monopoly rent represents a share of the total social surplus value. Monopoly rent thus depends on the appropriation of surplus value from the social pool. This is a critically important point for what follows in our analysis of 'media rent'.

**The Media Rent Economy**

As we have seen, Marx's theories of absolute, differential rent and monopoly rent were derived from his observations of 19th century capitalist agricultural land. Nevertheless, as Ernest Mandel (2003) writes Marx's theory of rent "can be easily extended into a *general theory of rent*, applicable to all fields of production where formidable difficulties of entry limit mobility of capital for extended periods of time."

Extending and adapting Marx's theory of rent to the particularities of the ad-supported media economy would thus appear to be a possible alternative to the materialist political economy put forth by Smythe and his followers. It is therefore surprising to realize that there have been so few attempts to pursue this perspective (but see Rigi and Prey, 2015). In Sut Jhally's book *The Codes of Advertising* (1987), Jhally refers to one notable exception: an unpublished paper by Patricia Arriaga.[70] Arriaga (1983) argues that Marx's theory of differential rent "is not limited to capitalist agriculture but can be applied whenever a greater productivity of capital is related to a

[70] Although I was not able to get a copy of this paper, Jhally does discuss Arriaga's argument in sufficient detail to understand her central argument.

natural or external condition not reproducible by capital" (Arriaga, 1983, 43-44; cited in Jhally, 1987, 118).

Writing in the early 1980s, Arriaga was interested in the case of broadcasting media. The "natural or external condition not reproducible by capital" she was referring to was the specific *location* of the broadcasting station. Location matters because the rent that broadcasters can charge advertisers is determined by the concentration of audience members in the station's broadcast range. In particular, as Arriaga points out "the importance of the number of consumers reached lies in the amount of consumer income they represent" (ibid.). Arriaga continues: "It is because of differences in location that equal investments in broadcasting stations yield different outputs, that is, different sizes of audiences reached by a given broadcaster" (ibid; cited in Jhally, 1987, 118-119).

It should be clear from our earlier discussion of Marx's theory of rent that Arriaga is making an analogy here between the relative natural fertility of land and the demographic 'fertility' of certain media markets. She is essentially arguing that the rent that broadcasters extract is an example of what Marx called 'differential rent I' since productivity differences are the result of "a specific external condition, i.e., a socio-economic and demographic condition which characterizes each market in which stations operate and which is not reproducible by capital" (ibid., cited in Jhally, 1987, 119). I would also add to Arriaga's argument that broadcasters can also extract differential rent II; for instance by purchasing certain programs that would appeal to certain choice demographics in a particular location. This would be comparable to the extra rent land owners can extract from land made more profitable through drainage or other capital

investment.

An even closer model for media rent than the agricultural sector though would probably be the urban rental market, with 'location' providing a more helpful analogy than 'fertility' (Livant 1985; Clarke, 1995). In an urban commercial district, or in a shopping mall, landlords extract rent from retailers who want to be located where potential customers can most easily access them. Similarly, media capitalists extract rent from advertisers in exchange for the right to access potential customers.

Furthermore, if we extend our analysis to online digital media and, in particular, ad-supported music streaming services, the particular 'fertility' of a services' user-base is not only influenced by the demographics attracted to the service, but also by how this user-base is targeted, profiled, and segmented into different consumer categories.[71] For example, advertisers can target Pandora Internet Radio listeners by age, gender, location, music genre, and the platform through which they are accessing the service. Like broadcast radio, Pandora generally follows the CPM (cost-per-thousand-impressions) model in charging advertisers. However, what differentiates Pandora and other music streaming services from broadcast radio and other mass media, is that only the demographic selected by the advertiser is exposed to the ad. Advertising rates are determined by a number of factors, including how attractive a particular segment is to the

[71] The main advantage interactive media provides for advertisers over traditional advertising in public spaces is that individual users can be personally targeted. It is as if highway billboard signs could change their message in real time depending on who was driving by at that particular moment, and then follow individual cars down the road.

advertiser. The device the ad will be displayed on, and the type of ad (display/audio/video), also heavily influence rates. For example, lower CPM rates are typically charged for mobile ads and audio ads than for video ads on desktop computers, largely because the latter are perceived to more effectively capture listener attention.[72]

In other words, capital investment in tracking and analytics software and in the development of algorithms greatly influences the amount of rent that can be extracted from advertisers by Pandora, Spotify and other streaming services. This would seemingly qualify as an example of what Marx called 'differential rent II'.

Nevertheless, there is an important distinction that renders problematic the direct application of Marx's theory of differential rent to the media market. In Marx's explanation of absolute rent, and in both cases of differential rent, the rent that landowners appropriate from capitalist farmers derives from surplus profits generated *within* the agricultural sector. However, as demonstrated in the previous chapter, surplus value is not generated within the media by audiences/users. The rent that commercial media owners extract from advertisers is deducted from the total surplus value produced in society as a whole, rather than that produced within the media site.[73] In other words, the origin of the rent extracted by media capitalists is surplus value which is produced

[72] Email correspondence with Pandora Internet Radio Account Executive, March 3, 2015.
[73] With subscription services, if the subscriber is a capitalist, this rent is paid out of a portion of the total social surplus s/he has extracted from the global working class. If the subscriber is a worker, s/he pays the rent out of his/her wages. In both cases this rent represents a portion of the total value that is produced by the global working class (see Rigi, forthcoming).

elsewhere in the economy. This makes media rent more analogous to what Marx called "monopoly rent". If we accept this point, the question that immediately arises then is what exactly do online media monopolize? Or, to put it slightly differently; what exactly do advertisers pay a monopoly price for?

To make the claim that media charge monopoly rents to advertisers is to argue that media control a scarce resource. In urban rent theory, "the rent for any urban site is an expression of the value of the monopoly privilege of providing retail services at that particular location" (Chamberlin 1933, 268, as cited in Evans, 1991, 4). Location is the scarce resource in urban rent theory because there are a finite number of attractive locations in any city.

Online digital media do not operate under such spatial limitations. Nevertheless, there are other forms of scarcity online. Advertisers pay to reach specific demographics of users. There are a finite number of internet users attractive to any advertiser and a finite number of places to find them at any given time. While media do not 'own' this audience it could conceivably be argued that they have a monopoly on their attention at specific times.[74] With the rapid proliferation of media content and services, and the resulting fragmentation of audiences, a "widening gap between limitless media and limited attention" (Webster 2011, 44) has been widely recognized (ie. Davenport and

[74] This is particularly the case with music streaming services displaying or playing a single advertisement at any one moment. Akin to terrestrial radio and broadcast television, but different from newspapers which may display several ads on one page, music streaming services monopolize a specific space/time of a listener's attention.

Beck, 2013).[75] We could thus argue that what media monopolize is what is increasingly scarce in the "information society" - attention.[76] Of course, considering the range of media options, no single service will ever monopolize the attention of all audience members. However, ad-supported media attempt to attract particular segments of the population and demonstrate to advertisers through engagement metrics that the attention of this population has been monopolized for a certain period of time.

For example, if a brand pays for a display ad on Pandora Internet Radio, this ad will only be served to the "engaged" listener, as user interaction is required to trigger the appearance of the ad. Pandora furthermore promises advertisers that their ad will not appear alongside any other ad. Likewise, Spotify sells its services to brands by highlighting how their audio ads reach a "highly-engaged target" when they play between songs, as "no other advertiser can interrupt users' attention while you are communicating with your audience" (Spotify, n.d.). Therefore, we could argue that the brand is paying a rent to monopolize - however briefly - the listener's full attention.

To take this perspective, however, is to begin descent down a slippery slope. Even

[75] This gap was already identified by Herbert Simon over 4 decades ago. Simon (1971, 40) neatly expressed the central insight, that has since developed into the sub-field of "attention economics": "...in an information-rich world, the wealth of information means a dearth of something else: a scarcity of whatever it is that information consumes. What information consumes is rather obvious: it consumes the attention of its recipients."

[76] There have also been more radical critiques of attention in contemporary capitalism. For example, in his book *The Cinematic Mode of Production: Attention Economy and the Society of the Spectacle* (2006), Jonathan Beller gives a Marxist reading of what he calls "looking as labour", of which cinema is the paradigmatic form. Beller argues that through cinema Capital first posits and then presupposes looking as a value-productive activity. "Looking as labour" he argues becomes even more central with new media forms today.

in the pre-remote control mass media era attention to advertisements could never be guaranteed. This remains the case, even as interactive media increasingly incorporate behavioural metrics to demonstrate audience engagement. 'Engagement' may be the key buzz word and currency in advertising circles but not only are audiences often distracted when they consume media, but they also actively resist advertising in myriad ways. In short, to assume a monopoly on attention is to bestow upon media too much power and to mischaracterize audiences as captive victims of the "consciousness industry".[77]

**Media Space**

Thus, media capitalists rent out neither audiences nor attention, for neither can be owned or controlled. Instead, I propose that what is monopolized and rented out by media capitalists can best be thought of as a type of *space*.[78] Following the lead of the well-established fields of Human-Computer Interaction (HCI) and Computer-Supported Cooperative Work (CSCW) we could refer to this general space as "media space" (Harrison et al. 1993; Harrison 2009). For our purposes, we are interested in the political economy of such 'media space'. In the following chapter, I will develop the argument that ownership over media space permits media capitalists to extract rent from advertisers

[77] Interestingly, Dallas Smythe (1977, 23n15) in the classic article that initiated the Blindspot Debate, remarks in a footnote that the reason why he chose to focus on 'audiences' as the main commodity rather than 'attention' is because 'audience' is a more direct way to remind us that it is human labour which creates value rather than 'attention', which is but one attribute of human labour.[77] Attention is also but one attribute of what I will argue media capitalists rent out.

[78] We will use the shorthand 'space' in full recognition that a more accurate way of describing what is rented out would be 'space/time'.

interested in introducing commodities to (potential) consumers. Cultural content – music for example – is the "free lunch" that lures audiences to these spaces. When listeners decide to pay a subscription fee to access streaming services and thus avoid ads, they are simultaneously replacing the advertiser as the primary renter.

However, this simple description already begins to lead us astray. As we will see in the next chapter, to describe such spaces as somehow pre-existing audiences/users is to make a common error. Media space is not a container into which audiences enter; it is a *relation* that is produced by the gathering of individuals. In other words, space emerges out of, and around, informational content (such as music). Following the French philosopher Henri Lefebvre, we will refer to such formations as "social space". Virtual 'social space', is a finite resource. Access to spaces where and when potential consumers gather is what advertisers rent (see Chen 2003; Caraway 2011; Rigi and Prey 2015). While so-called 'cyberspace' is theoretically infinite, the only spaces that matter for online advertisers are "social spaces" - the spaces that emerge *where* and *when* internet users gather.[79]

This formulation of space – which will be developed in much greater detail in the following chapter – is very different from what the advertising and media industry call, depending on medium, either "ad space" or "air time". Ad space is generally understood

[79] This is why we argued earlier that attention is but one attribute of what is rented. In contrast to the natural scarcity of land, media space is made scarce, in part, by finite reserves of attention.

to be a measurable space *in* or *on* a medium - such as a newspaper, a billboard, or a website - that is *sold* to advertisers. The medium thus forms a *container* within which static parcels of space exist, awaiting commodification. On the other hand, 'flow' media, like broadcast radio or television, see their business as selling "air time" - parcels of measurable 'time'. Our case study of online music streaming services reveals the arbitrary nature of assigning the sale of space to 'fixed' media, and the sale of time to 'flow' media. As Fernando Bermejo (2009, 144) points out "[t]he internet takes neither the form of a flow (as is the case with broadcasting) nor the form of a finished product with a fixed periodicity (as is the case with the press)."

Instead of transcending this economy though, the internet has simply made visible the limitations of viewing ad space and air time as the commodities inherent to their respective media forms. To do so is to confuse what is measured with what is produced. For example, even the quantitative parceling off of broadcasting 'air time' is dependent on the initial, and recurring, production of 'social space' (as we will see in the chapter 6 when we review the history of commercial radio). This crucial point highlights in concrete form the ontological fact that space can never be separated from time. The understanding of 'social space' that we will be developing sees space as produced through social practices; practices that take place over time**.** As Lefebvre (1995, 16) once

wrote; "[s]pace is nothing but the inscription of time in the world".[80]

Furthermore, by developing a materialist political economy of the media that foregrounds the role of rent, we are at the same time attempting to reinsert the centrality of space in the study of media political economy. The "audience commodity" as formulated by Smythe and developed by Jhally and Livant, and now Fuchs, is explicitly time-centric. This is of course an inevitable result of the attempt to apply Marx's labour theory of value to the realm of media consumption. The category of rent, on the other hand, provides us with a way to understand the political economy of media space. Henri Lefebvre argued years ago that Marxists have too often been focused on the production of commodities *in* capitalist space instead of the very production *of* capitalist space itself.[81] Likewise, the debate over the 'commodity' produced by media – whether 'audiences', 'watching-time', 'ratings', 'prosumers' or 'data' – has distracted us from recognizing that it is the production of media space itself that facilitates the extraction of rent – the central economic category of ad-supported media.

The relationship between media and space can be considered from various scales

[80] Lefebvre (1991, 219) helps us to grasp the mutual interdependence of space and time, when he writes: "...time is known and actualized in space, becoming a social reality by virtue of a spatial practice. Similarly, space is known only in and through time." This of course builds on the famous claim by Minkowski (1964, 297) that "space by itself, and time by itself, are doomed to fade away into mere shadows, and only a kind of union between the two will preserve an independent reality."

[81] Autonomist Marxists implicitly acknowledge the centrality of space when they use the "social factory" analogy. However, theirs is a camera obscura-like analogy that imposes upon what they see as new modes of value production the spatial metaphor of the traditional space of value production.
Does 'free labour' produce this 'social factory' space for autonomists? Or, is it the spreading of the factory which incorporates new activities into its realm? In other words, is it the activity (labour) or the space (factory) that is unique?

(see Clarke, 1995). While geographical space – in particular the relationship between media and the spatial phenomena of globalization – has been the focus of significant attention (ie. Harvey 1989; Carey 1989; Mattelart 1996), in general, media have not been understood as constituting a spatial form *per se*. When the spatiality of media *has* been foregrounded (ie. Adams 1992; Meyrowitz, 1985), there has been little attempt to conceive of media space as central to media political economy. The contribution this dissertation hopes to make revolves around the argument that understanding the political economy of media requires understanding the production of media space.

Thus, while I believe that the Marxist category of rent is a more appropriate starting point for the development of a materialist theory of media, it is just that - a starting point. What concerns us from here on in is *what* is rented – space – and how the need to extract rent shapes the production of such spaces. By focusing on music streaming services in the chapters that follow, the questions I want to examine are: how exactly should we conceive of this 'space' that media owners rent out to advertisers?; how is it produced in the first place?; and how does the need to extract rent shape music streaming space? In short, I argue that what is rented – space – should be the focus of critique.

In the next chapter, I want to first investigate how social theorists have theorized 'space' in order to clarify how we can think about 'media space'. While such explorations may appear highly abstract for now, I hope to impress upon the reader their importance for understanding the political economy of music streaming services, and communications media in general.

## Chapter 5: The Production of Media Space

It has been often commented (see Harvey 1989; Soja 1989; Clarke 1995) that much of what goes on under the rubric of 'social theory' can be characterized as being 'time-centric', all but ignoring space and geography. The same sentiment holds true when we focus in on matters of media and communication. Casual reference to media seems to naturalize this obsession with time. Each new communication technology further entrenches our prioritization of speed and contributes to the 'annihilation of space by time'. Theories of media and society have tended to replicate such indifference to space. For a long time a graduate student preparing for a comprehensive exam on the relationship between space, communication, and the media would struggle to know where to turn after reading obvious classics such as Harold Innis's (1951/1964) *The Bias of Communication*, and Joshua Meyrowitz's (1985) *No Sense of Place*. As well-regarded as these texts are, they were for quite some time relatively alone in examining the relationship between communication and space.[82]

The past two decades however have been witness to the so-called "spatial turn" in social theory: the "reassertion of issues of space into critical cultural theory" (Soja, 1996). With the rapid expansion of satellite television and emergence of mainstream

[82] In more recent years, both theoretical and empirically based monographs on the relationship between media and space have been published (e.g., Morley & Robins, 1995; Couldry 2000, McCarthy 2001; Parks, 2005) along with anthologies aiming to map the new epistemological fields of "media space" (Couldry & McCarthy, 2004) or "geographies of communication" (Falkheimer & Jansson, 2006). Finally, Mosco's (1995) classic *The Political Economy of Communication* gives center stage to the process of "spatialization".

internet usage, space also emerged as a more general topic of interest within media and communication studies and amongst geographers interested in communication technology. Still, much of this work can be located within one of two long-standing approaches to space: the first treats space as a physical locale, the second conceives of space as a mental construct. In doing so, this dualism replicates the classic Cartesian distinction of *res extensa* (the realm of corporeal substance and matter) and *res cogitans* (the ethereal realm of thoughts and non-material, spiritual existence). Let us briefly look at each of these approaches in turn.

The question of how communication technologies and media work to connect peoples across distances and transform places has long been of interest to scholars (see Innis 1950, 1964; Harvey 1989; Carey 1989; Mosco 1995; Mattelart 2000). For both scholars of communication interested in space and for geographers interested in communications, the focus has generally been on how media and communication technology transform physical space.[83] We can include in this tradition work that expands the definition of "communication" to not only involve the transportation of messages, but also the transportation of people and of goods. For example, Marx and Engels were interested in systems of communications and transport and how they shaped and produced space. As David Morley has pointed out "[t]heir concern was with the

[83] There are also significant examples of Geographers who have moved beyond this question of how communication technology transforms physical space, as evident in work on cyberspace and computer code, for example (Crang, Crang, & May, 1999; Dodge & Kitchin, 2001; Kitchin & Dodge, 2011).

connections between the technologies for transmitting messages, transporting commodities, and people, all of which was seen as part of a broader, geopolitical "science of territory…" (Morley, 2009, 114). For example, the train, understood as a system of communication, did much to shape geopolitics in the 19th century. "As much as the railroad *annihilated* space (distance), so too did it *create* spaces, making (previously) isolated lands accessible to more rapid and expansive networks of exchange" (Kirsch 1995, 542). We can say the same thing today about the internet, which brings connected areas closer together, at the same time as disconnected areas seem to disappear. Much has been written on this subject: what the geographer Doreen Massey calls "power-geometry".

There has been another rich tradition of scholarship that invokes space to understand communication phenomenon. Instead of a focus on how communication technology transforms physical space, this tradition (most commonly found within cultural studies) conceives of space as a mental construct, produced through signs and discourse.[84] A quick review of cultural studies scholarship brings up a whole range of different kinds of spaces: 'literary space', 'ideological space', 'dreamspace' etc. Benedict

[84] There are of course exceptions found within the diverse and broad tradition of Cultural Studies. In a well-known essay, Jody Berland (1992, 39) implores cultural theorists to "situate cultural forms within the production and reproduction of capitalist spatiality." She asks, "[h]ow does one produce the other: the song, the car, the radio station, the road, the radio, the town, the listener?...Why is the literature on pop music, like that on other genres, other media, so often empty of cars, not to mention elevators, offices, shopping malls, hotels, sidewalks, airplanes, buses, urban landscapes, small towns, northern settlements, or satellite broadcasts?" As Berland puts it, "the production of texts cannot be conceived of outside of the production of spaces" (ibid., 42). In short, what is being called for here is a shift of emphasis from *text* to *context* (see also Livingstone 2003).

Anderson's famous formulation of the "imagined community" provides a good example of mental space. Even Habermas's "public sphere" relies on spatial metaphor and can be included in this category.[85]

Descriptions of new media as a space distinct from 'reality' – which we enter in order to 'escape' material reality – emphasize this idea of mental space. Early theorists of so-called 'cyberspace', for example often suggested that we consider cyberspace as "an extension of our consciousness" (Anders 2001, 410).[86] 'Cyberspace' in this type of formulation, was simply slotted into the preordained category of 'mental space'. Strict demarcations between 'real' space and cyberspace and between the corporeal and the non-corporeal abounded in the late 1990s. "Nothing could be more disembodied than cyberspace" argued Internet pundit John Perry Barlow. "It's like having your everything amputated" (quoted in Nunes, 2006, 8). Even some of the more sophisticated examples of 1990s Internet scholarship reproduced such binaries. For example, Castells (1996) distinguished between traditional 'spaces of place', which were characterized by physical interactions in material locales, and an increasingly dominant technology-enabled 'spaces of flows' that link up distant locales and whose logic "essentially alters the meaning and

[85] The English term "public sphere" is the result of a creative translation of Habermas's term '*Offentlichkeit'* (meaning 'openness' or 'publicness'). As Lacey (2013, 5) writes, the spatial metaphor of the 'sphere' is "particularly fortuitous for an analysis of listening as a public activity. Sound surrounds, and can be approached from any and every direction, whereas the visual field is fixed and has to be presented face-on."

[86] Margaret Wertheim has argued that "the emergence of a new kind of nonphysical space [cyberspace] was almost guaranteed to attract "spiritual" and even "heavenly" dreams' and thus be viewed as a 'technological *res cogitans*'" (Wertheim 1999, 38).

dynamic of places" (Castells 1996, 428).

Of course, the idea of cyberspace as an 'elsewhere', distinct from 'real space', crumbles as soon as your mother friends you on Facebook (Stevenson 2012). In the past decade, scholars have increasingly critiqued the limitations of this artificial binary of 'real' and 'virtual' space, especially as mobile devices began to proliferate, freeing internet users to access cyberspace without being tethered to their desktops (ie. McQuire, 2006, de Freitas, 2010).[87] Furthermore, with the development and increasing deployment of geolocation technology and the geo-targeting of advertising and content, navigating cyberspace has become an experience of *re-placement* (Barreneche 2012), signaling for some, "the end of the virtual" (Rogers, 2009).[88]

For some scholars (ie. Kluitenberg et al. 2007), "hybrid space" has become a more nuanced way to describe the interpenetration of virtual spaces into our everyday lives. While 'hybrid space' and similar concepts can be useful, as Alex de Freitas (2010,

[87] "The modern city has become a 'media-architecture complex' in the words Scott McQuire (2006, 5). McQuire contends that urban space is filled with numerous interactions taking place simultaneously in both material and electronic spaces." (de Freitas, 2010, 634). At the same time, interest in what is popularly called 'the internet of things' has focused attention on the relationship between communication technology and urban space. Increased research on the material and representational production of urban space has been evident in a number of recent publications (ie. Boutros & Straw, 2010; Jansson, 2005; Jansson & Lagerkvist, 2009; McQuire, 2008).[87] In an influential essay Lev Manovich (2006) asks how our experience of urban space is affected when such "augmented spaces" are filled in with dynamic and rich multimedia information.

[88] Nick Couldry and Anna McCarthy's edited collection *MediaSpace: Place, Scale and Culture in a Media Age* (2004) is helpful in charting a path through the numerous ways media is implicated with space. Focusing on the question of how media produces spatiality, Couldry and McCarthy propose the concept of 'MediaSpace' to conceptualize mediated space. 'MediaSpace' as they write "defines the artefactual existence of media forms within social space, the links that media objects forge *between* spaces, and the (no less real) cultural vision of a physical space transcended by technology and emergent virtual pathways of communication" (Couldry and McCarthy, 2004, 2).

631) points out "simply interpreting contemporary public space as hybrid or layered with physical and digital elements is not sufficient" as such approaches can be criticized for their "dualistic treatment of the physical and digital", or material and mental space.

**Lefebvre and Spatial Trialectics**

A solution to such dualisms, I will argue, can be arrived at through dialectical thinking. In *The Production of Space* (1991), the French Marxist philosopher Henri Lefebvre develops a theory of space that brings together three "fields" of space: physical, mental and social. Lefebvre's theory of space begins with an attack on a familiar target: the absolutist conception of space as a neutral 'container', which is deeply rooted in Western thought.[89] We reproduce such a conception of space when we speak of things being "in" space. Of course, the absolutist view has been long challenged. In his famous early 18th century debate with Isaac Newton, Gottfried Wilhelm von Leibniz argued that space was relational, not absolute. Relational space cannot exist independently of the objects that constitute it. Rather than space 'containing' objects, it is the relations between objects that constitute space.

Following Leibniz, Lefebvre (1991, 83) argues "...a space is not a thing but rather

[89] 'Absolute space' is strongly associated with Isaac Newton, who argued that space had a structure of its own and existed independently of things. Absolute space is a fixed space that acts as a "container" within which objects and events occur. It is dichotomized from time, and associated with stasis while time is associated with change. This view of space is deeply rooted in the western psyche and pervades our language.

a set of relations between things (objects and products)."[90] As well, Lefebvre argues that space is neither a frame nor a container "designed simply to receive whatever is poured into it" (Lefebvre 1991, 93-94). Space, according to Lefebvre (ibid.), "is social morphology: it is to lived experience what form itself is to the living organism, and just as intimately bound up with function and structure".

In making the argument that space is something that human activity produces instead of something that human activity merely fills up, Lefebvre also drew from Heidegger.[91] Rejecting the objectivist-subjectivist dichotomy that characterized earlier debates, Heidegger had recast space as a condition and outcome of human action. In doing so, he followed Immanuel Kant in understanding space to be inseparable from human experience.[92] However, instead of defining space as an *a priori* feature of our mind, Heidegger's space emerges from our everyday pre-reflective activities. To speak of

[90] Marx of course famously argued that commodities are actually processes which only *appear* to us in the form of things. With Lefebvre's emphasis on demystifying space through relational thinking some have argued that Lefebvre's project represents "a spatialized rendition of Marx's conception of fetishism" (Merrifield, 1993, 520).

[91] Lefebvre's work is generally understood to build upon Hegel, Marx and Nietzsche but Stuart Elden (2004) makes a strong argument for seeing Heidegger as foundational in shaping Lefebvre's thinking: particularly about space. Indeed he argues that Lefebvre can be read as a theorists of "left-Heideggerianism" (ibid., 101).

[92] Kant had challenged both the absolute and relational theories of space with his claim that space was a subjective *a priori* feature of our mind, rather than an objective reality. 'Space' as such, could not, according to Kant, exist independently of our mind. It is a condition of how we experience the world. "Space is nothing but the form of all appearances of outer sense. It is the subjective condition of sensibility, under which alone outer intuition is possible for us" (Kant, 1965, A26, B42).

space in the Heideggerian sense, is to speak of the spatiality of action.[93]

What separates Lefebvre most clearly from Heidegger and others before him though, is that it is not space *in itself* that interests Lefebvre. Lefebvre's fundamental object of interest is instead the *production* of space. In the first chapter of his classic book *The Production of Space* (1974), Lefebvre lays out his aim:

> The project I am outlining…does not aim to produce a (or the) discourse on space, but rather to expose *the actual production of space* by bringing the various kinds of space and the modalities of their genesis together within a single theory. (Lefebvre, 1991, 16, *italics added*)

Lefebvre argued that space is produced through a dynamic interplay of material, conceptual, and experiential processes. This 'trialectical' approach is considered by some to be Lefebvre's greatest contribution to philosophical debates about space.[94] Lefebvre referred to these three processes as "spatial practice" [space as *perceived* through our senses], "representations of space" [space as *conceived*] and "representational spaces"

[93] As the philosopher Yoko Arisaka (1995, 4) explains succinctly: "What Heidegger is trying to capture is the difference between the nominal expression "we exist in space" and the adverbial expression, "we exist spatially." He wants to describe spatiality as a *mode of our existence*, rather than conceiving space as an independent entity."

[94] Schmid (2008, 33) for example, claims that Lefebvre's trialectical model "has no parallel in philosophy and the history of knowledge." Lefebvre developed his 'trialectics of spatiality' in order to overcome binary thinking. It takes into account the complexities of social reality in a manner not possible with the Hegelian and Marxist dialectic, which rests on two contradictory terms in contradiction that are sublated through a third term. For Schmid, it is imposible to truly understand *The Production of Space* without understanding Lefebvre's "three dimensional" dialectic.

[space as *lived*].[95]

For example, consider an ordinary space such as a typical high school classroom. If we were asked to describe this classroom, we might respond by making reference to the desks that are arranged in orderly fashion in front of a lectern. The architectural design of the room would vary, but our description would inevitably include four walls and a ceiling. Under Lefebvre's model, this description would suffice to cover merely one dimension of space; as it is *perceived* in its material form – what we will call 'perceived space'. This may be a sensible starting point for all descriptions of space, but we would have a seriously impoverished description of the classroom space if we ended here.

A second important dimension of space is the concept we hold of a particular space. "Space cannot be perceived as such without having been conceived in thought previously" (Schmid 2008, 39). Unlike previous philosophers who have thought about space, Lefebvre's intention is not to replace conventional wisdom with the 'correct' understanding of space. Instead, he asks us to hold on to our common representations of space. 'Conceived space' – as we will call it - plays an integral role in how we relate to particular spaces. The concept of a classroom and the function, meaning, or purpose of

[95] In *The Production of Space*, Lefebvre refers to his trialectical model in two different ways; the first triad (composed of 'spatial practice', 'representations of space' and 'spaces of representation') is based on Lefebvre's theory of language. The second triad ('perceived', 'conceived' and 'lived' space) is derived from French phenomenology (see Schmid 2008). For consistency and clarity, I will employ Lefebvre's phenomenological concepts: space as *perceived*, space as *conceived*, and space as *lived.*

such a space, is just as important as the material form of that classroom in 'producing' this space. We tend to conceive of a classroom as a different kind of space from, say, a bar, or a dance club. For example, that the teacher should be the focus of attention is built into the design of the classroom, while the idea that students in a classroom should be quiet shapes the social practices that in part produce such space. What is more, how we symbolically represent any space influences the meaning of that space. For example, think of how individual classes are represented and ranked within the wider school system through the grades their students receive.

Space as it is *lived* makes up the third dimension of Lefebvre's triad. Lefebvre understands space "in an active sense as an intricate web of relationships that is continuously produced and reproduced" (Lefebvre, 1991, 40). Space, in other words, is something we do. How we 'perform' a space, in part, produces that space. Students are expected to act like students, the teacher is expected to act like a teacher. The same material space no longer remains a classroom if the students replace the teacher with a DJ and start dancing. Material and conceptual dimensions of a space create limits to how much a space can be transformed (it is hard to turn a classroom into a swimming pool), but lived *practice* contributes significantly to the production of space. As Mark Nunes (2006, xxii) explains:

> Lefebvre's analysis allows for a critical approach to metaphorical and material space that recognizes the complex relation between the two. But even this account of space is incomplete, as it loses sight of the everydayness of space – its lived component.

It is also this lived dimension of space that reminds us that we can never theorize space without time. A moving body does not so much *occupy* space but rather contributes to

producing it. Lefebvre's conception of space is thus a dynamic one that avoids the static poverty of many other theories of space.

Once we accept this process-relational understanding of space, we are more easily able to grasp the spatiality of media, and in particular the spatiality of new media. Place- and space-based metaphors are certainly ubiquitous in the way we describe our online experiences. We *visit* a web*site*; we join a virtual *community* in cyber*space,* etc. While internet-speak may be dominated by spatial expressions and metaphors,[96] some scholars (ie. Graham 1998) have criticized our tendency to spatialize the web. "How can an assemblage of cables, routers, and servers be 'a space'?" (Cohen 2007, 227), they ask. However, the argument that cyberspace is not *really* a space is misguided, because there is no 'real' space to compare to. If we *perceive* and *conceive* of the internet as a space; if we act as if we are moving through space while online, then cyberspace is a space. Conceptions and practice have *real* consequences. This is the very point of Lefebvre's trialectical model of space.

Lefebvre's work on space is often considered to be most useful to geographers and urban theorists. While Lefebvre certainly focused on capitalism's relationship to urban space and the built environment, I argue that his theoretical model is flexible

[96] The novelist William Gibson coined the term 'cyberspace' in the early 1980s, long before the internet came into mainstream use, but the term persisted because it so closely aligned with how we experienced the early Internet. 'Cyberspace' was meant to suggest, as Gibson himself once remarked: "the point at which media [flow] together and surround us. It's the ultimate extension of the exclusion of daily life. With cyberspace as I describe it you can literally wrap yourself in media and not have to see what's really going on around you" (Woolley 1992, 122; cited in Saco 2002, 103).

enough to explain media spaces.[97] This is because Lefebvre's theoretical approach posits space not as a fixed entity, but as a dynamic set of relations that are actively produced, and reproduced in a constantly mutating process. This disabuses us of the tendency to always think of space either in its physical guise as a 'container', or alternatively, as a mental realm that we conceptually enter. This approach frees us to acknowledge forms of space permitted by mediation, which like all spaces are produced at the nexus of material, conceptual and lived processes.

We can better understand the advantages of Lefebvre's approach when we compare it to other attempts to theoretically fuse 'physical' space and 'mental space'. For example, as one of the very first academics to take seriously the idea of cyberspace as a space, Michael Benedikt (1991) suggests that cyberspace exists *between* the mental and the physical. It consists of both but is reducible to neither. Cyberspace's spatiality thus, exists in this 'inbetween' zone.

This might be a step in the right direction if we consider the poverty of referring to space as either a mental construct or a physical container. However, it does not help us much in understanding how such space is produced. As Christian Schmid (2008, 28) puts

[97] There are a few examples of academic work that link Lefebvre's work to 'cyberspace'. Diana Saco (1998) argues that cyberspace meets all of Lefebvre's criteria for the ways that social spaces are socially produced. Dale Bradley's (1998) dissertation uses Henri Lefebvre's theories for a discursive analysis of power relations in cyberspace. John Wise (1995) relies on Lefebvre's work to explore technology as a social space. More recently, Paul C. Adams and Andre Jansson (2012) refer to Lefebvre in trying to build a bridge between the disciplines of communication and geography. They posit ''communication geography'' as an emerging subfield that holds the potential to provide a processual view of ''communication as spatial production'' (ibid, 301, see also Jansson & Falkheimer, 2006, and Jansson, 2007).

it, "space 'in itself" can never serve as an epistemological starting position. Space does not exist 'in itself'; it is produced". Benedikt relies on evolutionary metaphors in order to explain the appearance of cyberspace *as* a space. The problem with an evolutionary model is that it takes the spatiality of 'cyberspace' for granted. In accepting such a model, we forfeit any critical questioning of precisely how and why this network of networks has been spatialized. In short, this approach ignores the political economy of space.

The purpose of this digression through space is *not* to correct spatial theory in media and communication studies. Rather than overly concern ourselves with the question of what media space is, in the spirit of Lefebvre, let us instead ask what media space is for. What is the role of media space within the political economy of commercial media, and within capitalism as a whole? As argued at the end of the previous chapter, ad-supported media produce space in order to extract rent from advertisers and in doing so, the circuit of capital is reproduced. Understanding the production of such media space is therefore essential to understanding the political economy of ad-supported media. However, as we will subsequently learn, not just any space will do. The production of a particular type of space is required in order to extract rent. Following Lefebvre, we will call such space "abstract space".

**Social and Abstract Space**

In his writings, Lefebvre's central argument was that capitalism is not just about the production of things *in* space. Perhaps even more importantly, capitalism is about the production *of* space itself. Capitalism not only captures preexisting spaces but capitalism

must also produce its own spaces in order to survive and reproduce itself.[98] Lefebvre (1979, 290) called the "*explosion of spaces*" precipitated by capitalism, "an extraordinary, little-noticed phenomenon."

In *The Production of Space*, Lefebvre focuses heavily on what he called "abstract space". Lefebvre was deeply influenced by Marx's analysis of the "twofold nature of labour": 'concrete labour' and 'abstract labour' (discussed in Chapter 3). Just as abstract labour is the particular incarnation of labour under capitalism, abstract space is the space of capitalism. Emerging out of the economic and political practices of the capitalist class and the state, abstract space is instrumental space "manipulated by all kinds of authorities" (Lefebvre, 1991, 51). This sets abstract space against 'social space'. Social space is the space we create through sociability, or "the space of use values produced by the complex interaction of all classes in the pursuit of everyday life" (Gottdiener, 1994, 127).

The production of "abstract space" marks a transformation of space into a (fictitious) commodity that can be distributed and consumed. Abstract space, writes

[98] This is of course has also been a central tenet of David Harvey's prolific writings over the years, particularly in his discussion of the replacement of commodities by services. For example, in *The Condition of Postmodernity*, Harvey has shown how the primary "need to accelerate turnover time in consumption has led to a shift of emphasis from production of goods (most of which, like knives and forks, have a substantial lifetime) to the production of events (such as spectacles that have an almost instantaneous turnover time)" (Harvey, 1989, 157). This shift, as Harvey recognizes, is something of a godsend for capitalism. Capitalism suffers from periodic bouts of overaccumulation – crises that arise whenever overproduction makes it difficult to keep surplus capital in circulation. One way, thus, to keep capital in motion is to commodify spaces and services that are not captive to the limitations of material objects.

Lefebvre is "a commodified space—in which all elements are rendered equivalent as exchange values, but which is necessarily fragmented into individual lots and parcels" (Lefebvre, 1977/2003, 87-88, as cited in Wilson, 2013, 368). This is because, the production of abstract space requires that space be made divisible, measurable and comparable. In a previous chapter we discussed Marx's analogous description of the move from 'concrete' to 'abstract' labour. Just as labour was made abstract through the implementation of temporal measure, the commodification of space followed "the implementation of a system of representation, which would depict different "pieces of space" as distinct and endowed with comparable features" (Stanek, 2008, 71).

"Abstract space is measurable", writes Lefebvre (1991, 352). It is measure that allows for qualitatively heterogeneous spaces to be rendered homogenous and thus quantitatively comparable.[99] This is important because only once something is made comparable can it be exchanged on the market. As we will see in the following chapter, from the earliest days of commercial radio, media have struggled to make individual listeners/viewers/readers quantitatively comparable: what Philip Napoli (2003) describes as turning the "actual audience" into the "measured audience". The terms 'abstract' and 'abstraction' reminds us that there is no one-to-one relationship between the 'audience' and the representation of that audience through ratings and measurement data (see also

[99] Lefebvre here directly builds on Heidegger's critique of modern technology, which, rooted in Cartesian metaphysics "takes the world as a substance which can be ordered, planned, and worked upon—instead of worked with" (Elden 2004, 92).

Napoli 2003).The first step is always to abstract from the individual audience member by universalizing certain attributes, characteristics, behaviours, etc. In other words, abstraction serves to bring invisible audiences/users into visibility and to render concrete attributes and activities comparable.

In the mass media era, demographics were taken as a proxy for empirical knowledge about purchasing habits. So-called 'new media' introduce a change of degree, rather than kind, to this most basic problem of ad-supported media. New media attempt to solve this problem through *interactivity.* Interactive media partially contribute to an atomization of measurement, through cybernetic feedback loops. This is why social media platforms work so hard to attract and cultivate the 'engaged' user. Engaged users are measurable users. However, new media also introduce a whole host of new problems by necessitating a re-negotiation of what constitutes abstract audience/user activity. Suddenly we witness the emergence of questions such as: what exactly do we mean by 'engagement' and how precisely can or should it be measured?

According to Lefebvre, class struggle stands in the way of abstract space "taking over the whole planet and papering over all differences" (ibid, 55). "Papering over" is the key phrase here. Abstract space could never *replace* social space. To do so would be to extinguish itself, like a fire that burns away all its fuel. Remember that Lefebvre developed his theory of abstract space from Marx's explanation of the duality that structures the relationship between concrete and abstract labour. The two sides of this duality Lefebvre (1991, 355-56) argues are mutually interdependent: "It is impossible to overemphasize either the mutual inherence or the contradictoriness of these two aspects

of space…" Just as abstract labour in the office is made possible by concrete labour in the home, abstract space is dependent upon social space.

Perhaps, we can most helpfully think of abstract space as a 'layer'. Much like the Internet itself exists in layers—physical, protocol, application, content, social (Zittrain, 2008, 130) – so too is the political economy of commercial media space defined by the layering of abstract space over social space. Commercial media layer the social space produced by users with a quantifiable abstract space, which then permits the extraction of rent from marketers.

Thus, the argument that I am developing here is that ad-supported media do not produce messages or audiences so much as they produce 'abstract (media) space'. Historically, this has been a reoccurring, though never uncontested, process. In the following chapter, I will provide three examples of how the media social space is layered with 'abstract space'. I start with a history of the commercialization of early radio. I then move on to peer-to-peer file sharing and describe how a similar process of layering through measurement took place in the first decade of the 21st century. Finally, I will provide a detailed look at the production of 'abstract space' on contemporary music streaming services.

## Chapter 6: From Social to Abstract Space

All new media are about 'remediation' (Bolter and Grusin 1999). It is therefore impossible to understand the abstract spaces of contemporary music streaming services without first historicizing this particular sector. If we consider music streaming as simply the latest incarnation of audio media formats, then we can trace back its genealogy to the emergence of terrestrial radio broadcasting. This is most obvious when considering personalized internet radio services such as Pandora Internet Radio, but it is also true of on-demand services.[100] I will thus begin this chapter by focusing on early radio as a social space that was transformed into abstract space through the imposition of the radio ratings systems. A brief history of this transformation may help us place 'abstract' music streaming space in perspective. I then shift to the more recent example of early P2P file-sharing services, in particular Napster. I argue that Napster and subsequent 'pirate' sites were social spaces that gradually became abstract spaces through the imposition of two types of surveillance: what Arditi (2012) calls "repressive surveillance" and "market surveillance". Finally, in order to better understand the production of abstract space on contemporary music streaming services such as Spotify and Pandora, I turn to an in-depth examination of how listeners on these two services are measured, segmented and monetized. Before we begin this examination of more recent means of measuring

[100] Music streaming services can literally be understood as "screen radio" - the term originally used to describe television. As Lacey (3013, 44) points out though, in the UK press of the 1950s, radio was generally called "sound radio", implying that television is a form of radio too.

listeners, let us turn back to the early years of the 20th century and the emergence of amateur radio. The broad, and partial, historical overview presented here is important as it allows us to see music streaming services as the latest incarnation of an ongoing, conflicted, struggle between 'social space' and 'abstract space'; a struggle that I argue characterizes all ad-supported media.

**Radio Social Space**

Agency, in the public sphere, Kate Lacey (2013, 165) points out, is usually marked through the act of speaking: in other words, "to be listened to, rather than to listen." This may be why it seems so counterintuitive to speak of terrestrial radio as a 'social space'. We tend to think of radio as a passive medium. However, contrary to popular perception, listening, as several scholars have taken pains to argue, is an active, not a passive, activity.[101] Radio historian Susan Douglas (2004, 4) for one argues that, "[e]ven though you might be lying on the living room floor, or lounging in a chair, you [are] anything but passive." Radio invites the listener to participate by filling in the appropriate visuals. In her compelling and romantic history of radio *Listening In: Radio and the American Imagination,* Douglas (ibid, 29) describes how the orality of radio

[101] In her thought-provoking book *Listening Publics*, Lacey (2013) marks a distinction between "listening in" – "a receptive and mediatized communicative action" and what she calls "listening out" – "an attentive and anticipatory communicative disposition". It is this distinction that she argues "opens up a space to consider listening as an activity with political resonance" (ibid, 8). In other words, we need not enquire into the actions (ie. speech) that follow the act of listening, for "(l)istening is at the heart of what it means to be *in* the world, to be active, to be political" (ibid, 163).

collects listeners together, creating an invisible bond through the magic of words and music:

> Because the act of listening simultaneously to spoken words forms hearers into a group (while reading turns people in on themselves), orality fosters a strong collective sensibility. People listening to a common voice, or to the same music, act and react at the same time. They become an aggregate entity – an audience – and whether or not they all agree with or like what they hear, they are unified around that common experience.

We can thus conceivably describe radio as a social space, produced into being through the act of listening. However, this certainly does not seem to describe our experience of radio today. Scanning the radio dial for even a few minutes can leave one with the sense that the airwaves have been fully colonized by advertising and top 40 hits. With its incessant jingles and restricted rotation of pop music blasting at passive listeners stuck in rush hour, to listen to radio today, it would seem, is to wholly enter 'abstract space'.

Marketers and the music industry have long figured out how to enlist broadcast radio as a willing partner in the battle to commodify listening time and space. Historically, however, while the 'actual audience' coalesced around and through early radio content, the 'measured audience' took considerable time, effort and struggle to produce.

Radio as a medium is less demanding than television in the sense that it frees the listener up to do other things while listening. Radio is more seamlessly fused into our everyday activities – driving, working out, cooking etc. – than any other media. Radio, is thus much more adaptable to different contexts. The fact that radio listening is so easily and seamlessly integrated into our everyday lives has long presented both an opportunity and a challenge to advertisers. Listeners can be reached at many times and places, but

their attention is less assured. The question of how listening could, or should, actually be measured thus presented many difficulties. In Lefebvrian terms, abstract radio space was not a natural outgrowth of the medium's technological affordances: it had to be produced. It is to a brief history of this effort that we now turn.

In the decade before World War 1, America was transformed by a legion of hobbyists tinkering away in their garages and attics. These hobbyists – mostly urban middle-class white men and boys - struggled to assemble their own radio sets from a motley assortment of spare metal and electrical parts. From curtain rods, oatmeal boxes wrapped with wire, Model T ignition coils, and inexpensive crystals, sprung makeshift radio sets that scanned the night skies across Canada and the US for far off signals. By 1910 amateur radio enthusiasts outnumbered private radio companies and the military as the largest single group on the air (Douglas, 2004, 59).

Importantly, the first radio amateurs designed both radio receivers and transmitters. The two-way communication of early 'ham' radio broadcasting reminds us that this was the peer-to-peer network of the early 20$^{th}$ century. The similarities do not end there. Early radio hobbyists were also considered by many to be a nuisance, even a threat, to those in power. The deliberate spread of false or obscene messages by amateur transmitters was a common topic of indignation in press reports of the time. That the U.S. Navy – the military unit most heavily dependent on radio communication – was a particularly popular target of pranks, made amateur radio hobbyists even more unpopular in some circles. However, little could be done to punish such pranksters. "The temptation to indulge in such practical joking", as Susan Douglas (2004, 59) recounts, "was

enhanced by the fact that detection was virtually impossible."

The Radio Act of 1912 required that all amateur broadcasters be licensed and restricted the power of their sets. This however, did not stop or even slow down the popularity of amateur radio.[102] The public image of 'hams' improved with the founding of the American Radio Relay League in 1914, which assembled a network of amateurs ready to relay emergency messages. The Relay League organized "a grassroots, coast-to-coast communications network" that made it possible, according to *Popular Mechanics*, "for the private citizen to communicate across great distances without the aid of either the government or a corporation" (in Douglas, 2004, 60). Douglas (ibid., 331) reminds us that "[n]ot until the spread of the Internet in the mid-1990s were other Americans able to communicate across the distances that the hams did."

After the disruption caused by the First World War, amateur radio regained its momentum and by 1920 amateur stations were fifteen times more numerous across the US than all other types of stations combined. A new obsession of 'DXing' - the hobby of receiving and identifying distant radio signals, or making two-way radio contact with distant stations - quickly took hold in the early 1920s amongst so-called 'distance

[102] The Radio Act was passed in response to the "ceaseless interference, cruel rumors, and utter misinformation" (Douglas 2004, 60) that took over the airwaves after the sinking of the Titanic in April 1912.

fiends'.[103]

Predating the homogenizing effects of network radio, programming at this time was locally produced for local audiences. Regionally distinct music, language, and programs greeted the ears of DXers, making it possible to "listen in for difference". As Douglas (2004, 75) writes, "…it was not uncommon for labor unions, churches, and fraternal orders to produce shows for ethnic and working-class listeners."[104]

The historical record demonstrates that early radio listeners in America "found broadcasting a miracle and the prospect of becoming part of a national radio audience enthralling" (Smulyan, 1994, 12).[105] For example, a 1924 magazine essay celebrated radio's ability to bring remote villages and villagers into direct contact with each other,

[103] Susan Douglas (2004, 73) describes how the most dedicated distance fiends "had a United States map on the wall next to the radio that showed the locations of broadcast stations across the country, and they marked each time they reeled one in." The particular programs broadcast by such stations mattered little to them. Much like how the sheer wonder of downloading free music files from Napster often overshadowed what one was actually downloading ('Wait, I don't actually like Pearl Jam!'), "it (was) not the *substance* of communication without wires but the *fact* of it that enthralls", as one DXer put it (Douglas, 1989, 307).
[104] While long distance fiends dropped in on distinct local programs throughout a vast, diverse nation, the DXers themselves skewed heavily male, white, and middle-class. The third-prize winner of *Radio Broadcast* magazine's "How Far Have You Heard" contest for 1923, Ms. Abbye M. White, revealed the gender bias of early radio space when she wrote: "Rather fearfully I venture into your contest, for I do not know if we of the fair sex are allowed in or not. But your rules say nothing against it so here I am." (Abbye M. White, "Hearing North America," *Radio Broadcast* 3 Sept. 1923; as cited in Smulyan, 1994, 16).
[105] Marshal McLuhan once called radio a "tribal drum" for its ability to promote a sense of collectivism amongst listeners that harkened back to "the ancient experience of kinship webs" (1964, 263). McLuhan's concept of "acoustic space" is also interesting to consider in light of our discussion of Lefebvre's process-relational theory of space. "Acoustic space" as McLuhan one explained "has no point of favored focus. It's a sphere without fixed boundaries, space made by the thing itself, not space containing the thing. It is not pictorial space, boxed in, but dynamic, always in flux, creating its own dimensions moment by moment. It has no fixed boundaries; it is indifferent to background" (Carpenter & McLuhan 1960, 67).

"the task of making us feel together, think together, live together"[106] (as cited in Douglas, 2004, 76).

Radio listening not only bridged distant villages across the airwaves, but it also brought neighbors together in shared physical space. Since the ownership of a radio receiver was still not widespread, communal or collective listening was a popular everyday practice.[107] One woman from a small town in South Carolina described how the privileged few who owned a radio entertained their neighbors:

> We had a large discarded church bench in our back yard that was moved to the porch of a neighbor who had radio. All the spare chairs available throughout the neighborhood were collected. We would gather there in the evening to listen to all the music and talk beamed to us from Pittsburgh (as cited in Douglas, 2004, 77)[108]

By the mid-1920s the novelty of listening to distant stations had worn off. Engineers had seemingly reached a technological limit in terms of their ability to extend the range of radio reception. Thus, the focus shifted towards both improving the quality of the tone and the appearance of the actual radio set. In place of homemade radios, assembled by

[106] Let us pause for a moment on this quote. Radio, it is promised, will make Americans "feel together, think together, live together". It may be a bit too convenient to point out that this commentator has identified the three phenomenological moments that according to Levebvre trialectically produce social space: perception ('feel'), conception ('think') and practice ('live').

[107] In the UK, collective listening was pursued for its perceived democratic benefits. Kate Lacey (2013, 140), describes how in the early days of the BBC, much effort was put into promoting collective listening in public spaces. "The 'Group Listening Scheme' was driven by daily programmes at peak listening times designed to inspire discussion on themes such as *This Changing World.* The hope was that listening in groups would stimulate 'the capacity to listen to other people's ideas even when they are unpalatable, and to follow up by discussion and calm analysis'."

[108] Poor reception often necessitated creative solutions. Accounts of neighbors huddling around a washtub in which radio speakers were placed in an attempt to amplify a poor signal, or designating a play-by-play announcer to relay from a rooftop to the crowd below a distant sporting event, demonstrate how *perceived* space influenced the *lived* space of radio listeners.

father and son and set up in the family garage or attic, elegant radio sets that resembled fine furniture were now being marketed to housewives. Advertising of the time reveals the change. While previous ads for radios highlighted distances reached, 1925 *Radio Broadcast* ads displayed radios in luxurious homes, with the caption "transforms mere radio reproduction into artistic recreation" (in Smulyan 1994, 19).[109]

By the mid-1920s, broadcast radio also began to fulfill its familiar role as facilitator of "mass" audience formation and organization, particularly around music, but also comedy. The mass radio audience was however not simply the natural outcome of an inherent broadcast nature of radio, as it is often assumed. Early commercial radio delivered a 'mass audience' in part, because measuring techniques of the time were crude and could only approximate undifferentiated masses of people. The 'measured audience', we are reminded, always shapes the means through which the 'actual audience' is organized. It is here that we arrive at the crucial role of measure in the production of abstract radio space.

**Measure and the Production of 'Abstract' Radio Space**

It is difficult to exaggerate the social transformation set into motion by the mainstream adaptation of radio in the 1920s. Writers of the time gushed that radio

[109] Here we begin to see the truth of Susan Douglas' (2004, 5) statement that "radio hastened the shift away from identifying oneself - and one's social solidarity with others – on the basis of location and family ties, to identifying oneself on the basis of consumer and taste preferences."

listeners constituted "the greatest audience ever assembled by any means for any purpose in the history of the world" (as cited in Douglas, 1989, 312). However, radio was a revolutionary medium at the time not merely for the size of the audience it assembled, but also for the invisibility of this audience. How could radio broadcasting become a viable business when its 'customers' were invisible? As Hugh Beville Jr (1988, xii) writes:

> At its beginning it was a new, exciting, almost mystical phenomenon based on unseen waves shooting through the atmosphere at the speed of light. No purchase record was created by the user. There was no newsstand sales or home delivery subscriptions, no box office, no gate receipts. For advertisers there were no pages to scan, no dummies to critique, no tearsheets to prove actual appearance, and no publisher's statement or Audit Bureau of Circulation to establish number of distribution copies.

It was thus difficult to imagine at first how radio could be a standalone industry, let alone morph into the predominant marketing vehicle for consumer capitalism in general and the recording industry in particular, that it has since become.[110] The familiar story that is usually told in radio industry histories is one of discovery: the discovery of the advertiser as the sponsor that would make "free" listening possible.[111] Of course, a closer look at such histories reveals that this was a highly charged debate. It was by no means obvious that radio should be funded by advertising. Indeed, there was overwhelming resistance to this type of business model. As Susan Smulyan (1994, 68) writes in *Selling Radio,*

[110] At first, music radio seemed to signal the end of the recording industry. Just like Napster and subsequent P2P services 70 years later, radio provided free music for people who had previously purchased records. Record sales, which peaked in 1921 at $106 million dropped to $6 million in 1933 (Garofalo, 1999). However, the recording industry managed to rebound from this slump to become even more profitable than ever. By the end of the 1930s radio began to rely on recordings and the record industry began to rely on radio to promote their stars.

[111] Selling airtime for commercial messages began with AT&T's invention of "toll broadcasting" in 1922.

"advertising stood out among the financing options only because it elicited the loudest protests and had the fewest supporters."[112]

Advertising eventually prevailed, in large part due to a campaign, led by NBC, to convince listeners, legislators, and broadcasters, that the future of radio (should) lay in the hands of advertisers (ibid 72-81).[113] However, advertisers *themselves* needed to be persuaded that their future lay with radio. In fact, radio's task to convince advertisers that they should trust this unproven new medium was just as difficult as its battle to overcome public resistance to advertising.

The problem was a lack of agreed upon metrics. For example, radio DJs at the time often asked listeners to mail in letters in an attempt to determine the popularity and geographical range of a program. The practice of using letters to provide an approximate measure of program popularity continued into the 1930s (Smulyan, 1994, 96). Such a crude form of audience measurement simply could not compete with the metrics issued by the Audit Bureau of Circulation for print media. Thus, it was very hard to convince advertisers to put some of their money into radio, instead of, or along with, print.[114] As

[112] For further in-depth discussion about the battle over the commercialization and regulation of early radio, see McChesney, R. W. (1995) *Telecommunications, mass media, and democracy: The battle for the control of US broadcasting, 1928-1935*. Oxford University Press.

[113] Radio advertising remained deeply unpopular amongst many however. While the pre-television 1940s is often depicted as the Golden Age of Radio, Victor Pickard (2014) has recently documented the "revolt" against commercialism on the airwaves in that decade. Progressive groups like the Congress of Industrial Organizations (CIO) and the NAACP, religious groups, and everyday listeners, organized and protested what radio had become.

[114] Early advertising sales were often based, as Kate Lacey (2013, 35) writes, "on (gendered) suppositions about the audience combined with basic demographic statistics rather than dedicated audience research."

Hugh M. Beville (1988, 3) writes:

> Much had to be taken on faith. How many families had radio? What areas were served by various stations? When did people listen? What programs were people listening to? And especially what is the size of my program's audience? Who is actually listening?

Eileen Meehan (1984, 222) has explained that radio needed to "demonstrate the existence of an audience". Beyond simply providing proof of listener numbers though, radio broadcasters needed to show that the right audience was listening. In economic terms, broadcasters and advertisers could enter into business relations "[o]nly after agreeing on a basic method for producing measures of productivity and quality…" (ibid). Advertisers, not surprisingly, wanted to know what they were getting for their money.[115]

Systematic studies of radio listeners and listener preferences had been developed earlier (see Smulyan 1994, 96). The first network program rating service was developed by Archibald M. Crossley who started his own research organization, Crossley, Inc., in 1918 to conduct political polling.[116] Crossley had developed what was at the time a revolutionary new research method: sample telephone interviews that asked radio listeners to recall what they had been listening to (Beville, 1988, xiii). However, it was not until 1929 that the first formal ratings system and telephone surveys were launched (Lacey, 2013, 35). Then, in 1936, A.C. Nielsen began experimentation with a mechanical

[115] It should again be pointed out that while broadcasters may "sell" time to advertisers, radio, as other forms of media, must first gather together audiences (ie. produce social space) for these segments of time to be able to command a price.
[116] It was Crossley who coined the term "rating" (Buzzard, 2012, 14).

recording device called the *Audimeter*. When attached to a radio receiver the audimeter provided a continuous record of what station the set was tuned to, when and for how long. As a mechanized audience feedback system, Nielsen's audimeter proved a break-through measuring technology. Competing ratings agencies such as CAB and Hooper who relied on telephone interviews were unable to measure the degree of station switching that was the norm among listeners.

However, broadcasters and advertisers were initially slow in trusting results produced by the audiometer so Nielsen supplemented this data with visits to "guinea pig" homes. These homes allowed monthly inspections of their kitchens and bathrooms by Nielsen staff in order to determine the effectiveness of advertisements these listeners had been exposed to. These visits also allowed Nielsen to collect more valuable demographic data about listeners, such as their income levels.

Around the same time, Austrian émigré Paul Lazarsfeld was struggling with the very same questions that guide contemporary music data analysis. Indeed, if one person could be crowned the dean of market research, it is the Lazarsfeld. Trained in the Austro-Marxist tradition, after resettling in America in the 1930s, Lazarsfeld dedicated himself to "categorizing people and comparing how different groups behaved" (Douglas, 2004, 126). We briefly discussed at the beginning of Chapter One Lazarsfeld's strained collaboration with Theodore Adorno when they worked together on the "Radio Research Project". Much of tension between Adorno and Lazarsfeld could be attributed to Adorno's scorn for quantitative research (Müller-Doohm, 2005). However, as Douglas (2004, 140) relates:

> Lazarsfeld was not some mindless number cruncher; he was deeply interested in often unanswerable questions: What kind of music engages our desire and why? Why do people choose one radio show and not another? And he was determined to break people's subjective processes down into definable, measurable components and moments, as if one really could develop an equation, some statistics, a questionnaire, that would codify the relationship between sensual stimuli and individual longing.

**Social and Abstract Radio Space: An Ongoing Struggle**

While an audience measurement system that worked for both radio broadcasters and advertisers had been established by the 1940s, it would be a mistake to conclude that abstract space prevailed unchallenged from this point forward. Radio social space has never disappeared. At various times it has even been re-invigorated.

For example, while FM radio is now the preferred destination for radio advertisers, it appeared in its early days as a challenge to the commercial "abstract space" of AM radio.[117] This is particularly so for the generation that came of age in the 1960s. FM radio of the late 1960s was underground, often anti-corporate, and musically diverse. While it attracted a broad audience amongst youth, the educated, and the upwardly mobile, FM radio stations initially had a difficult time monetizing this listenership. Once again, metrics – or the lack there of – contributed to this situation.[118] Susan Douglas (2004, 277) quotes an ad executive who claimed that advertisers were hesitating to put

[117] Charles Siepmann's 1946 book *Radio's Second Chance* put its hope in "the radio of the future" - FM radio – as an alternative to commercial AM radio.
[118] As late as October 1974, FM radio could muster only 14 percent of total radio revenues, even though it had a one third share of total radio listening (Douglas 2004, 277).

money into FM radio because "[t]here is no real hard information on the FM audience, its composition or its buying power". Instinct and stereotype portrayed early FM listeners as "the province of eggheads and Hi-Fi buffs". Over time however, "[t]he incursion of more systematic market research into the FM industry" (ibid) created a clearer picture of just who this audience was. With this knowledge, FM radio stations began to develop much tighter radio formats - oldies, soft rock, album-oriented rock, country etc. - in an attempt to fragment the 'mass' listening audience into standardized 'taste spaces' more conducive to targeting. In doing so, they "began to rein in the diversity and experimentation of the late 1960s" (ibid). At the same time, they tried to capitalize on FM's 'alternative' reputation. As Douglas (ibid) writes:

> The industry sought to co-opt some of the stylistic innovations of underground while purging it of left-wing politics and too much musical heterogeneity. What such initiatives began to do was exploit some of the iconoclasm of FM in order to turn the anticorporate ethos to the industry's advantage. To appeal to the younger market, the ABC-FM network developed a hybrid format with the musical predictability of the AM format but the announcing style of underground.

Today, FM radio clearly dwarfs AM in revenue. The one-time upstart has certainly succeeded in producing a segmented and monetizable 'abstract space'. However, radio social space remains. Though marginalized, amateur radio has survived and remains a significant subculture around the world. Unified through a coded global language of abbreviations (the Esperanto of the airwaves), 'Hams', as amateur radio enthusiasts proudly call themselves, have created an alternative social space, and in the process an alternative history of radio. Their vision of radio, as Douglas (1989, 292) writes, has "provided an important countervailing force to the bureaucratic management of, and mindset about, radio."

> They have demanded and cultivated a commercial-free zone in the spectrum in which individuals— not just corporations and ad agencies— are allowed to transmit, to explore, and to connect with one another (Douglas, 2004, 330).

Central to the ethos of ham culture has long been the principle of social anonymity. All that matters when two hams connect is the connection itself. Journalistic investigations of this "scientific fraternity" often emphasized the social leveling promoted by such invisibility. An article in the October 1941 issue of Harper's magazine states:

> …the social and monetary criteria of the outside world were tacitly barred. In New York City, the boys of the Bronx, using homemade condensers coated with tinfoil still redolent of Liederkranz cheese, compared notes over the air with the affluent members of the West Side— five miles distant, geographically, but a social light-year removed. (Dreher and Bouck 1941, 538)

Exactly 50 years later, in 1991, similar claims greeted the arrival of the World Wide Web as a publicly available service on the Internet. 1991 was also the year that the MP3 file format was accepted as a standard. In a few short years, the MP3 and the Web would be married in a union known as Napster – the digital music sharing service that facilitated an explosion of music-centered social space online. It is to this direct precursor of contemporary music streaming services that we now turn.

**The Social Space of Napster**

Lawrence Lessig (2004) famously referred to online music file sharing as the "crack cocaine" of the Internet's early growth. The promise of free music, according to Lessig was the greatest driver of demand for internet access. Indeed, it is difficult to exaggerate the sheer sense of incredulity that washed over most music fans the first time they experienced Napster. The amount and range of music that was suddenly available to

anyone with an internet connection was unprecedented. As Alex Winter, director of the documentary *Downloaded* says in an interview with *The Guardian*:

> There was no ramp up. There was no transition. It was like that famous shot from *2001: A Space Odyssey*, when the prehistoric monkey throws a bone in the air and it turns into a spaceship. Napster was a ridiculous leap forward (as cited in Lamont, 2013).

With free access to millions of tracks, Napster was often portrayed as a feeding frenzy. However, for co-founder Shawn Fanning the point of Napster was just as much about creating a community as it was about making music more accessible. As Fanning put it in an early interview, Napster "was rooted out of frustration not only with MP3.com, Lycos, and Scour.net, but also to create a music community" (Varanini, 2000).

In their facilitation of online music community, we can understand Napster and subsequent file sharing services, in Lefebvrian terms, as "social spaces" produced around the practice of sharing music.[119] Sociability was also produced through technical features that Napster developed, many of which have since been adapted and extended by contemporary social networking services. For example, Napster provided a real-time index of who was online and who had signed off. This allowed Napster to provide "constant awareness of the presence of other users and of the contents of the network" (Morris, 2010, 196). Specific features such as Chat and HotList also encouraged a sense

[119] Several academic commentators have focused on how sharing digital music through P2P services facilitated the building of community. Jones (2002) argued that the Internet provides a 'new geography' whereby 'affective communities' of music are formed. Hughes and Lang (2003) described the changes precipitated by Napster as a 'power shift' from the traditional music industry to new self-organized digital music communities.

of a community and allowed individual users to connect to other music fans through Napster. Through the Hotlist feature, for example, users could 'follow' others with similar tastes and to see the contents of their library whenever a hot listed peer signed on to Napster. As Jeremy Morris (2010, 205) writes:

> While the (Napster) website was an explicit attempt to build/facilitate a community, to provide it with direction and purpose, the interface worked at a more implicit level. It drew users together in a series of technical and social relationships through its features; relationships that were premised on the circulation of files and making that movement and connection visible to users.

Napster's rapid rise was stalled when it was forced to shut down in 2001 due to a court injunction. The major record labels subsequently developed fee-based services such as MusicNet and Pressplay, in a short-lived attempt to develop a for-profit, on-line distribution system for their respective (and partial) music catalogs. This did nothing to stem the tide of "illegal" P2P services. From KaZaA, to LimeWire, IsoHunt and the Pirate Bay, numerous decentralized services followed in Napster's wake and P2P file-sharing became even more ubiquitous in the years to come (see Menta 2001; David 2010).[120]

We can describe the emergence of P2P filesharing services as a particular 'virtual' example of the 'explosion of spaces' Lefebvre saw as capitalism's most transformative feature. Particularly when read in the context of the disruptive impact of P2P file sharing,

[120] Estimates of the bandwidth consumption of P2P file sharing in the years immediately following Napster's demise ranged from 35% (Yu et al., 2006) to 60% (Tsoumakos & Roussopoulos, 2003) of total internet traffic.

Lefebvre's observation, that "[n]either capitalism nor the state can maintain the chaotic, contradictory space they have produced" (ibid), is incredibly perceptive in this context.

**File Sharing Surveillance**

The Recording Industry Association of America's (RIAA) response to the threat of P2P file sharing has been well documented (Burkart and McCourt 2006; Park 2007; Caraway 2011b). "Pirates" were singled out and disciplined through heavy lawsuits. However, along with sharing music, file sharers were also unwittingly sharing something else: personal information. David Arditi explains what is revealed when someone logs onto Napster, Kazaa, Morpheus, Gnutella, LimeWire or other P2P programs:

> First, the most visible bits of information about her are her genre preferences as articulated by the specific music that she possesses in her shared music folder. Second, there is a record of her search history. Third, there is data stored on the music she samples and the music she downloads. Finally, a computer savvy person can identify personal characteristics about her from her zip code, from her credit card purchases, and from other websites she visits (Arditi, 2012, 190-91).

Surveillance of P2P programs was justified by the industry as necessary in order to build court cases against file sharers. However, as Arditi (2012, 192) argues, at the same time such surveillance had a hidden purpose: the development of more refined marketing strategies. Realizing that P2P services provided a window into the consumption habits of listeners, the recording industry began to employ extensive surveillance techniques. For example, personal information about a file sharer could be combined with preferences this individual displayed on other websites. After the launch of iTunes it became possible to combine data from P2P services with songs purchased from the iTunes Store. As Arditi (2012, 191) puts it, "[i]f it was very difficult to tell exactly which music interested

our customer in the record store, it becomes very easy to monitor her music interests on the Internet." Thus, while post-Napster music file sharing services were by this time fast on their way to becoming lucrative ad-supported commercial spaces,[121] they were at the same time being transformed into abstract spaces for the recording industry.

It seems that much of this surveillance was soon outsourced to companies that began to specialize in the surveillance of file sharing. As a *Salon* article from 2001 stated: "… a whole new crop of market research companies is springing up online — call them Napster parasites or, more politely, symbionts — eager to take advantage of the wealth of personal data that can be mined from hard drives all over the world" (Brown, 2001). Jun Group, Webspins and BigChampagne were some of the early pioneers in this new field. Even though many 'pirates' tried to remain anonymous by relying on usernames, dynamic IP addresses and other means, these startups began to mine and organize information about file sharing and file sharers (Morris, 2010, 178). As the RIAA staged an all-out war against online piracy, these startups sold the information they collected to record companies (Lawrence, 2004). Most prominent among these early startups was BigChampagne.

**BigChampagne**

BigChampagne has been called the Billboard or Nielsen Ratings of file-sharing

[121] A recent report published by the Digital Citizens Alliance (2014) estimates that the major "pirate sites" generate $227 million in yearly ad revenue.

networks (Howe, 2003). In its own words, BigChampagne claims to offer "immediate access to the music preferences of the largest listening audience ever measured" (Billboard, 2005, as cited in Morris, 2010, 210). In order to fulfill this mandate, BigChampagne collects data across a wide range of platforms, including iTunes and other online music retail outlets, social networks, subscription services, web searches, streaming sites, band websites, and YouTube. However, it was really with the tracking of file-sharing networks that BigChampagne made its name. The company designed software capable of tracking and archiving the entire contents of shared folders and up to fifty million daily search queries. By matching partial IP addresses to zip codes, BigChampagne was perhaps the first company able to build a real-time map of music downloading.

According to co-founder Eric Garland, "[w]e seized onto P2P because it allows a singular opportunity to observe really intimate consumer behavior. You're not asking (file sharers) what's your taste in music, games, books, what have you — you're looking in the pantry, straight into the fridge" (Brown, 2001, as cited in Morris, 2010, 210). Like the difference between A. C. Nielsen's Audimeter and telephone interviews for early radio measurement, Big Champagne, as Jeremy Morris (2010, 210) puts it "purported to measure what people were *doing* not what they were *saying* or *thinking* (emphasis in original)."

BigChampagne thus promotes itself as offering a more scientifically reliable lens into music taste than previous methods of tracking music sales. Certainly, when compared to the data provided by SoundScan, BigChampagne is able to provide record

companies and its other clients with a much more detailed picture of geographical and demographic music consumption. Clients are provided with charts that describe which files are being heavily traded and which songs are trading well in particular regions. BigChampagne can even determine what percentage of file-sharers in a particular market have a particular song. Perhaps most useful are the correlations that could be drawn between artists. Since BigChampagne surveys the entire contents of users' shared folders, it can determine that, for example, 34 percent of people who have at least one Elliott Smith track have also downloaded a song by Stephen Hedley. This provides a wealth of opportunity to categorize file sharers by radio format or micro-genre. Overall, this detailed data breakdown provides record labels with an opportunity to exploit file sharing in order to more effectively target their marketing campaigns. For example:

> …record labels can pressure radio stations in a particular region to play an artist's hit song by arguing that the music has been downloaded X amount of times during the past week in that region. The record label can also use the data to encourage radio stations in a specific region to conduct on-air interviews or promos because of an artist's local popularity. Then, record labels can use this location-specific data to make sure that an artist's tour passes through the regions in which that particular artist is most popular to play a concert (Arditi, 2012, 200).

In 2009, BigChampagne signed a deal with Universal Music Group (UMG), the largest music corporation in the world, to provide UMG with "analysis of songs and listening patterns from millions of users of social networks and online music services, including file-sharing networks" (Hefflinger, 2009).[122] BigChampagne charges its clients

[122] BigChampagne was purchased by LiveNation in 2011.

anywhere from $2,000 per month to track one album to $40,000 per month to monitor the all the artists signed to a record label. With such a hefty price tag, BigChampagne is clearly a service developed for use by corporate clients rather than independent labels or artists and labels (Arditi, 2012, 199).

Interestingly though, record companies were initially very reticent to admit that they worked with companies like BigChampagne, as it made them appear hypocritical. As a *Wired* article from 2003 explained:

> The record industry's lawsuits against file-sharing companies hang on their assertion that the programs have no use other than to help infringe copyrights. If the labels acknowledge a legitimate use for P2P programs, it would undercut their case as well as their zero-tolerance stance.

The reality was that in response to the threat posed by file sharing the recording industry combined two types of surveillance - what Arditi (2012) calls “repressive surveillance” and “market surveillance”. Repressive surveillance tried to frighten ‘pirates’ with the threat of lawsuits while market surveillance attempted to turn piracy into a source of consumer information. “P2P programs became both the source of copyright violations and the source of a new type of market analysis. The RIAA and the major record labels use both forms of surveillance together to structure online consumption habits” (Arditi, 2012, 192).

Still, there are limits to tracking downloaders. It is not possible to know how many times a downloaded track or album has been listened to. In addition, because P2P services do not require users to log in, BigChampagne and similar tracking services cannot establish the precise identity of the person using a given computer to download files. In this way, music streaming services represent the next evolutionary stage in the

production of abstract space around digital music.

Nevertheless, it is important to point out that contemporary music streaming services would not exist today without the massive disruption precipitated by Napster and its peer-to-peer successors. In fact, there is a straight line that runs from the pirate ship to the corporate office. The people, technology, and philosophies that defined early P2P services such as Napster are easily discerned in contemporary streaming services such as Spotify and Rdio.[123] Napster co-founder Sean Parker is an investor in Spotify, a Spotify board member, and an ambassador to label executives and musicians. He was also the founding president of Facebook, easing Spotify's incorporation into the social media giant's platform. As well, former Napster Director of Digital Rights Management and Client Software Development Jan Jannink founded the music streaming service iMeem in 2003.

Aside from continuities in personnel and technology though, Napster's legacy is how it demonstrated that "social space" could be organized around digital music, and that online music space was measurable.[124] On contemporary music streaming services all listening-time is data-generating time. This is what distinguishes such services from previous ways of consuming music. Let us now turn to a more in-depth look at the

[123] Spotify relied on Bittorrent technology until quite recently. Spotify's been described on Torrentfreak.com as "a massive p2p network blessed by record labels" (Ernesto, 2011).
[124] This is why, referring to Napster, Jeremy Morris (2010, 170) argues that counter-intuitive as it may seem "the program that the major record labels have so vilified as the culprit for declining revenues from music is actually one of the prime reasons why a market for digital music commodities exists in the first place."

production of abstract space through data mining and analytics on contemporary music streaming services.

**Producing Abstract Space on Music Streaming Services: The Echo Nest**

One way to understand the production of abstract space on music streaming services is to investigate how listeners and music content are measured and segmented by the analytics companies that work behind the scenes for music streaming services like Spotify. These analytics companies facilitate the production of abstract space that music streaming services rent out to advertisers. Foremost among these companies is The Echo Nest, "the world's leading music intelligence company."[125]

Before it was purchased by Spotify in early 2014 - for a reported price of around $58m (Ingham 2015b) - the Echo Nest had over 40 customers in the music streaming industry,[126] claiming to reach over 100 million music fans every month.[127] Before the sale, The Echo Nest helped music services such as Rhapsody, Rdio and Clear Channel's iHeartRadio to more accurately personalize their service by analyzing a listener's history

[125] Based in Somerville, MA, The Echo Nest was co-founded by two MIT PhDs. Its investors include Commonwealth Capital Ventures, Matrix Partners, Norwest Venture Partners and three cofounders of the MIT Media Lab (The Echo Nest, n.d.).
[126] Digital music services (such as Rdio, Rhapsody, Spotify, Clear Channel's iHeartradio) represented around 90 percent of the company's revenues (Dredge, 2012). Other customers included editorial, video and social media networks (BBC.com, Foursquare, MTV, Twitter, VEVO, Yahoo!), connected device manufacturers (Buongiorno, doubleTwist, Nokia) and big brands (Coca Cola, Intel, Microsoft, Reebok) (The Echo Nest, n.d.).
[127] To date, over 400 applications have been built on The Echo Nest platform, making the company the key platform (other than Facebook) that music app developers are building on top of (Dredge, 2012).

and recommending similar songs.[128] More recently, The Echo Nest has turned its attention to employing data "to help advertisers reach the right music fans" (The Echo Nest 2013b). When it launched its 'Music Audience Understanding' service in 2013, CEO Jim Lucchese, was quoted as saying that the company was going from "What's the next song you want to hear?" to "What ads are you likely to respond to?" (as cited in Hof, 2013).[129]

In company white papers, The Echo Nest promotes itself as offering a deeper understanding of music listeners, for, as they point out "[e]very business knows that the key to monetization is a deeper understanding of their customers" (The Echo Nest, 2013a). The assumed advantage to understanding listeners follows a long accepted theory: 'If you tell me what you listen to, I'll tell you who you are.' As The Echo Nest cofounder Brian Whitman argues "Music preference can predict more about you than

[128] A Forbes article on The Echo Nest, refers to the service as the "online radio equivalent of a Data Management Platform" like BlueKai, which "provide data to online publishers and advertisers so they can place real-time bids for ad space on millions of websites and apps" (Hof, 2013). The critical difference from data broker companies such as BlueKai however, is that The Echo Nest does not sell data or cookies to advertisers directly, but instead works with music services, ad networks, and brands.

[129] Lucchese describes the company's mission as follows: "With streaming becoming mainstream, music consumption has moved from a broadcast, push-only experience, to a two-way, personalized conversation with each fan. This switch opens up a new world of opportunities for music services to more deeply understand musical identity and create more personalized, social and profitable music experiences" (The Echo Nest, 2013d). In describing music experiences as "social and profitable" we see how the production of abstract space on steaming services is dependent on social space, or at least on the ideology of social space.

anything else" (as cited in Vanderbilt, 2014).[130]

Figuring out a particular listener's "musical identity" - what type of music fan you are and what that says about you beyond music listening habits – is key to the Echo Nest's business. Indeed, they believe that musical identity "will define the next growth phase in online music" (The Echo Nest, 2013a), as it will help companies **"**drive ad and subscription revenue by capturing dynamic listening analytics from every music fan, and using that data to segment audiences, increase conversion rates, and improve ad targeting" (Baym, 2013).

Of course, that there is some correlation between music taste and age, gender, ethnicity and even lifestyle interests, is not a new discovery. The entire business of ad-supported broadcast radio, as discussed above, has long been predicated on the idea that music taste is an important proxy for listener understanding, and a tool for listener segmentation. What The Echo Nest has done however, is to take this idea out of the realm of common sense. As Jim Lucchese, CEO of The Echo Nest, puts it though, "[s]aying you're reaching hip hop fans doesn't cut it anymore" (in Hof, 2013). Instead, with a knowledge base of more than a trillion data points, covering more than 35 million songs and 2.5 million artists, The Echo Nest treats music taste correlation as a scientific problem that can be solved by huge data sets.

[130] Significant academic research has been conducted on the question of whether particular personality traits can be associated with particular music tastes (ie. Hansen & Hansen 1991; Dunn & Bouwhuis 2011), and research has shown that we do make many assumptions about people based on their music collection and listening habits (Rentfrow & Gosling 2006; Rentfrow, McDonald, & Oldmeadow 2009).

Just how exactly does The Echo Nest do this? Essentially, they attempt to turn both conversations about music, and music itself, into quantifiable data.[131] To accomplish this seemingly Sisyphean task, The Echo Nest conducts semantic analysis of online conversations about music that take place every day, all over the world — millions of blog posts, music reviews, tweets and social media discussions. The Echo Nest platform compiles key words found in descriptions of the music and its creators and then links them to other artists and songs that have been described with similar key words and phrases. This data is used to determine song similarities on a more cultural level.

At the same time The Echo Nest's acoustic analysis software processes and classifies music according to multiple aural factors - from its pitch to its tempo to its danceability. "The system ingests and analyzes the mp3, working to understand every single event in the song, such as a note in a guitar solo or the way in which two notes are connected," co-founder and CTO Brian Whitman has explained. "The average song has about 2000 of these 'events' for the system to analyze. It then makes connections between that song and other song with similar progressions or structures" (as cited in Darer, 2012).

[131] This methodology allows The Echo Nest to circumvent inherent problems associated with collaborative filtering ("those who bought X also bought Y"). The problem with collaborative filtering is that it does not take into account any knowledge about the music itself; it only cares about the usage patterns around it. As Brian Whitman of the Echo Nest puts it "A Beatles album on Amazon will simply show that listeners also bought other Beatles albums, while the closed loop of popularity bias makes it nigh impossible for new music to enter the system" (as cited in Vanderbilt, 2014). To solve this problem, The Echo Nest correlates knowledge about listeners with insight into music content.

Once the world of music has been mapped, then the task becomes to figure out where each individual listener fits on this map, and their individual movements through music space. To this end, the Echo Nest collects a real-time, dynamic record of the type of music fan you are – your music tastes (artists and songs) and music behavior (favorites, ratings, skips, and bans). This is called your 'Taste Profile'. Taste Profiles are organized into music segments (see Fig 1 below). Such segments are categorized in numerous ways: for example, artist- and genre-based segments (ie. listeners who like Beyonce but also like Punk music). Other segments are built from listener behavior (ie. listeners who prefer diversity and discovery).

**The Echo Nest's Music Segments**

| Segment | Description |
|---|---|
| Genres & styles | High affinity for one or more of 710 musical genres (e.g. Indie Rock, "Honkytonk") |
| Artists | High affinity for a specific artist (e.g. Jay-Z, Van Halen, Kid Rock, Miley Cyrus) |
| Mainstreamness | Affinity for well-known vs. obscure artists |
| Diversity | The variety of preferred music styles and genres |
| Freshness | Preferences for new and recent artists vs. older music |
| Locality | The geographical spread, worldwide, of one's preferred artists |
| Currency | Preferences for music in heavy rotation currently |
| Discovery | Preferences for emerging, but not yet trending music |
| Song Hotttnesss | Preference for an artist's popular songs (vs. more obscure) |

Fig 1: from The Echo Nest 2014a, 3.

**Matching Audiences with Ads**

What I've described so far clearly has practical uses for song or artist recommendation, but what about targeting ads? How can figuring out the type of listener you are allow a streaming service to figure out what ads they should show you? With the vast majority of users opting for 'free' ad-supported services, this has increasingly become *the* central question streaming platforms are faced with. The Echo Nest attempts to provide a solution by utilizing predictive modeling to analyze streaming music listening behavior in order to identify psychographic characteristics of listeners: including personality, values, opinions, attitudes, interests, and lifestyles. The company accomplishes this by comparing music affinity to already-known demographics and lifestyle interests. The predictive models that are developed from these incredibly large data sets are continually being trained and validated against 'ground truth' survey data.

In this way, The Echo Nest claims to be able to identify "statistically meaningful relationships between music taste and non-musical information including age, gender and dozens of lifestyle categories" (ibid). Lifestyle categories include 'Gamers', 'Foodies' or 'Jetsetters' – consumer categories that can be targeted by relevant advertisers. With the detailed knowledge of its listeners provided by the Echo Nest, a music streaming service like Spotify can package its listeners to the advertisers that best align with their interests (see Fig 2 below).

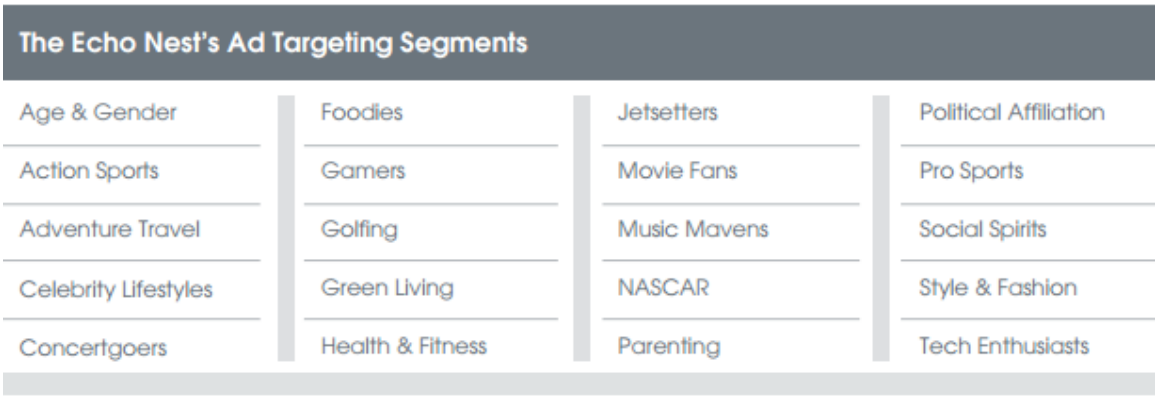


Fig 2: from The Echo Nest, 2014a, 4)

Music streaming services are determined to increase the rent they can charge advertisers for the right to access their listeners. Segmenting listeners according to standard and custom-designed lifestyle categories is one way to accomplish this. As The Echo Nest (2013b) points out, "(w)ith more targeted advertising segments, music services can improve performance to command higher CPMs, while minimizing poorly targeted ads that erode engagement."

Recently, The Echo Nest began working with the world's largest digital audio advertising network - TargetSpot. TargetSpot serves ads to about 85 radio groups and online music services, and thousands of music, talk, news and sports channels. Upon making the announcement of the partnership, Leigh Newsome Co-CEO/CTO of TargetSpot opined that the new deal "will enhance our user-level targeting capabilities and provide exceptionally accurate demographic information across our audience" (cited in The Echo Nest, 2013c). Advertisers gain insight into their listening audiences' location

down to the zip code level[132], the time of day they are listening, and personal listening preferences. Sequential targeting and retargeting have also been made easier. "Advertisers" according to Newsome, "want these insights to understand the connection between their brands audience and music behavior" (ibid).

Thus, with the help of The Echo Nest's solutions, music services and their advertisers can create dynamic music segments organized by musical genres and behavior, ad-targeting segments that include demographics & lifestyles, and custom segments based on music listening activity (see Fig. 3 below).

[132] In early 2015, Spotify improved its local advertising capabilities by rolling out a new platform. The 'Spot Radio Platform' helps advertisers geotarget audiences in the US (Rowley, 2014).

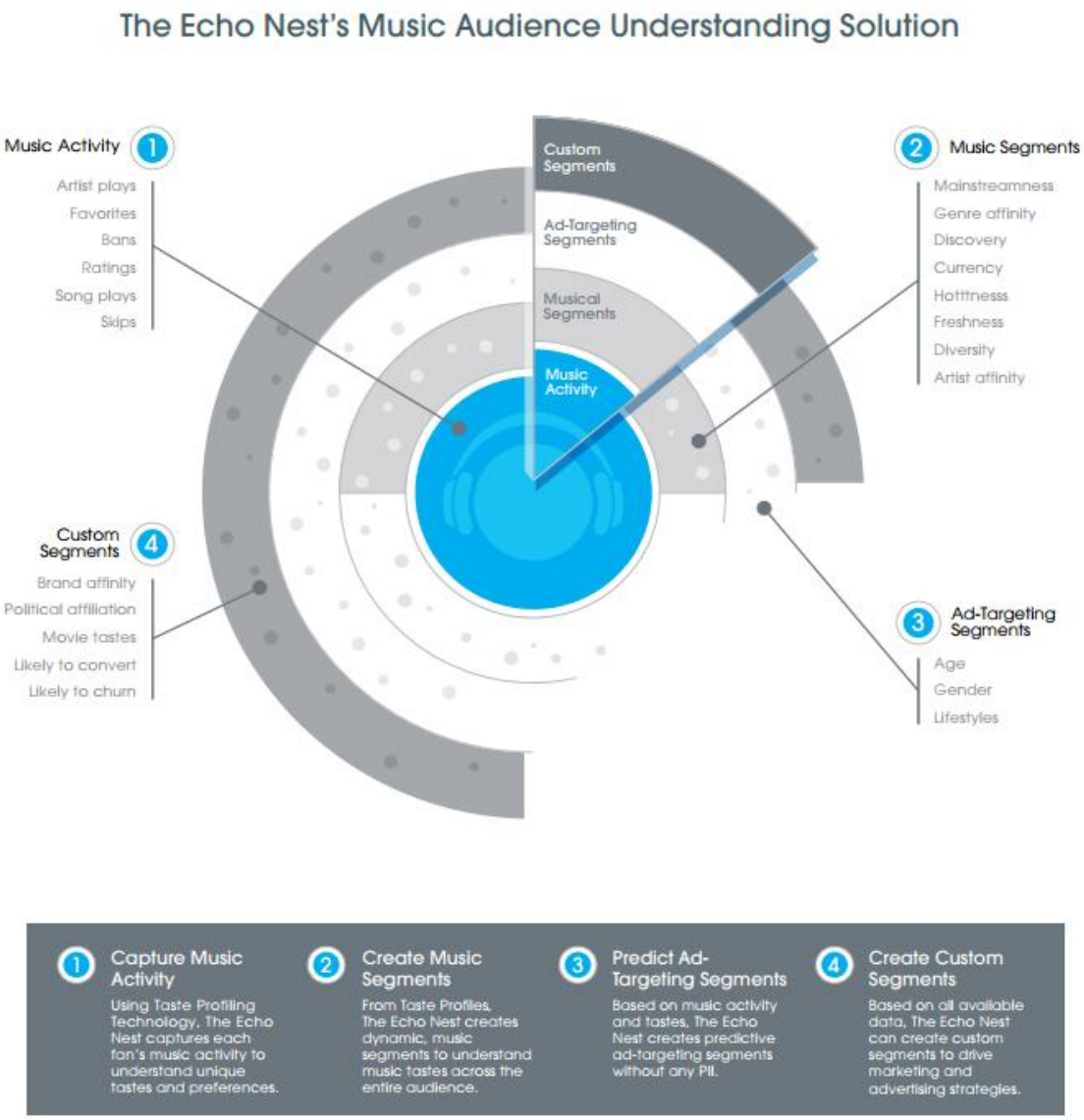


Fig 3: from The Echo Nest, 2014a, 2)

**Pandora Internet Radio**

Pandora Internet Radio, the leading audio streaming service in the US, is even more dependent on advertising than Spotify. Advertising typically accounts for over 80 percent of Pandora's yearly revenues, as only a minority of Pandora listeners choose to pay $36 annually in order to subscribe to the ad-free version (Pandora Internet Radio,

2015). As with its streaming service competitors, Pandora's ability to segment listeners and target them with ads builds upon its combining of users' registration data - age, gender and ZIP code - with the time of day, day of week and device used.

However, Pandora's ability to dissect the music we listen to and to draw correlations from these songs in order to offer similar tracks, and appropriate ads, is dependent on its unique contribution to music taxonomy - the 'Music Genome Project'. Let us now take a detailed look at Pandora's Music Genome Project.

**Measuring Music: The Music Genome Project**

The Music Genome Project was first conceived of in 1999 and brought to market in January 2000 as a company called Savage Beast Technologies. Savage Beast Technologies initially licensed its Music Genome patent as a music recommendation service to companies like AOL and Best Buy. Commercial success was elusive however, so after receiving some venture funding, the company was re-launched in 2005 as Pandora Media with a new focus on providing personalized online radio for consumers.

As Pandora grew into the dominant leader in personalized internet radio, the Music Genome project has remained its defining asset.[133] Instead of grouping songs by genre (as record shops and radio stations do), by collaborative filtering, or by ratings, Pandora organizes music by musical traits. According to Nolan Gasser, Chief

[133] On May 19, 2015, Pandora announced that it was purchasing the music data firm 'Next Big Sound' to help it provide additional analysis of listeners and to help brands choose artists with which to partner.

Musicologist for Pandora and the architect of the Music Genome Project "the basic idea with Pandora was to see if we could approach music from almost a scientific perspective; that's why it's called the Music Genome Project, named not accidentally after the Human Genome Project."

In an interview, Glasser argues that the comparison to genetics is not a mere metaphor. Biologists understand the human species by first identifying each individual gene, determining how each gene contributes to making us individuals, and then understanding how our genome connects us to our immediate family and more indirectly to those who we share physical attributes or capabilities with. The same relational model underpinned Glasser's approach to designing the Music Genome Project.

> The idea was to tackle in turn each distinct "species" of music—and we naturally started with the most vibrant one in the music industry: pop and rock music. So my tack was to conceive of pop/rock as an individual musical species, and then to figure out what individual genes make up its genome. From a musicological standpoint, we can break down the musical identity of a pop/rock song into the fundamental parameters of music analysis: melody, harmony, rhythm, form, instrumentation, sonority, lyrics, and several others. We can then break down each of these large-scale parameters into detailed and nuanced individual traits—or genes—that are manifest in some way or another in every pop/rock song. (as cited in Lasar, 2011)

In short, a music gene is understood to embody a characteristic of the music. Such genes could include for example, the gender of the lead vocalist, the tempo of the chorus, the level of distortion on the electric guitar, the type of background vocals, etc.[134]

Each attribute, or gene, in a particular song is assigned a number between 0 and 5,

[134] For more detail see Glaser, 2006.

in half-integer increments. Once songs have been thoroughly assessed, they are spatially organized. According to the patent:

> Each gene can be thought of as an orthogonal axis of a multi-dimensional space and each song as a point in that space. Songs that are geometrically close to one another are "good" musical matches. To maximize the effectiveness of the music matching engine, we maximize the effectiveness of this song distance calculation. (ibid.)

Of course, different styles or genres of music require different sets of 'genes'. According to the patent application for the Music Genome Project, the number of genes differs widely between musical genres. Rock and pop songs have 150 genes, rap songs have 350, jazz songs have approximately 400, while world and classical music have between 300–500 genes (Glaser, 2006). There is no single, one-size-fits-all list of attributes that fit all types of music. For example, since rap music is lyrically driven, it requires a greater list of subsets of genes within the category of lyrics – rhyme schemes, rhythm, degree of profanity etc.

The construction of a music genome is incredibly labour intensive as it is requires intricate analysis by a Pandora employee in a process that takes 20 to 30 minutes per four-minute song.[135] Pandora does not use machine-listening or other forms of automated data extraction. Such a human-based approach to music analysis is thus very different

[135] Who are these analysts who listen to music all day, dissecting the inner workings of every individual song? According to Pandora's website: "The typical music analyst working on the Music Genome Project has a four-year degree in music theory, composition or performance, has passed through a selective screening process and has completed intensive training in the Music Genome's rigorous and precise methodology. To qualify for the work, analysts must have a firm grounding in music theory, including familiarity with a wide range of styles and sounds" (Pandora Internet Radio, n.d.).

from the Echo Nest's computer generated models.

Once all the attributes for a particular song have been entered, the song is placed topographically within a set of other similar songs using a distance function.[136] When a listener chooses a song to start a station, behind the scenes Pandora quickly locates the Genome analysis for that song. Pandora is not able to play a specific song on demand because Pandora is classified as a non-interactive streaming service under the Digital Millennium Copyright Act of 1998.[137] Instead, Pandora rapidly runs an algorithm to compare the song to the genetic makeup of every song in their database in order to identify songs that contain similar traits. As stated in the patent application, "[t]he matching engine effectively calculates the distance between a source song and the other songs in the database and then sorts the results to yield an adjustable number of closest matches" (Glaser, 2006). Those songs deemed 'closest' will then make up the new 'station'.

Thus, the first song to play is selected based on the magnitude of the distance between the source song and each of the songs in the database. Once the algorithmically-chosen song begins to play, the listener is able to give the song a thumbs up if s/he likes it, or a thumbs down if s/he doesn't. This feedback instantly changes the station's playlist. Thumbs down and that song will not play on that particular station again.

[136] In mathematics, a distance function is a function that defines a distance between elements of a set.
[137] Under the DMCA (Digital Millennium Copyright Act of 1998) non-interactive streaming services are granted a license to stream sound recordings after paying the statutory rate to SoundExchange. This permits them to avoid having to negotiate directly with copyright holders of each recording (see Lane, 2010).

Thumbs up and the listener will hear that song, and other songs like it, more frequently. Behind the scenes what this feedback effects is the particular weight given to some genes over others. "By raising the weights of genes that are important to the individual and reducing the weights of those that are not, the matching process can be made to improve with each use" (Glaser, 2006). In other words, by continually providing feedback, Pandora learns more and more about each listener's tastes, resulting in a progressively more personalized station.

While admittedly a very simple feedback cue, a thumbs up or thumbs down on a track is one of Pandora's most valuable forms of behavioral data. Every single interaction affects the next song that is delivered to you. However, these interactions all carry a different weight. For example, a song skip is considered a less important indication of dissatisfaction than a thumbs down. In an interview with Forbes, Pandora's chief scientist Eric Bieschke notes,

> You can skip a song because while you like it you have simply heard it too much, or you're just not in the mood for it at that moment. And if you're a new user, you may be looking for something very specific…or you may just be curious about how our song selection process works. So with a skip we have to divine its intent which is not easy (as cited in Diaollo, 2013).

However, this does not mean that the skip is unimportant as a data point. "Rare signals (user interactions) are very valuable and have big implications", Bieschke points out. "So if you're a longtime user who never hits the skip button and then you suddenly do it, we pay close attention to that and respond accordingly" (ibid). Bieschke further reveals that for a brand new user, as little as three user interactions can give Pandora most of what it needs to know to deliver the best results (in Diallo, 2013).

**Building Ad Spaces**

"It's becoming quite apparent to us", says Eric Bieschke, "that the world of playing the perfect music to people and the world of playing perfect advertising to them are strikingly similar" (cited in Singer, 2014).[138] In a New York Times article that explores Pandora's ability to target its listeners with the right ads at the right moment, the reader was asked to imagine the following scenario:

> Consider someone who's in an adventurous musical mood on a weekend afternoon…One hypothesis is that this listener may be more likely to click on an ad for, say, adventure travel in Costa Rica than a person in an office on a Monday morning listening to familiar tunes. And that person at the office…may be more inclined to respond to a more conservative travel ad for a restaurant-and-museum tour of Paris (ibid.).

By measuring the frequency of ad clicks and other methods, hypotheses such as this one are being tested by Pandora. Pandora has also been digging into their first-party data in order to segment listeners into categories that online advertisers are accustomed to.[139] In late 2013 Pandora began promoting to ad agencies their first two audience segments -

[138] Pandora listeners can opt out of receiving targeted ads, but while opting-out will prevent targeted ads, they will simply be replaced by generic (non-targeted ads).

[139] At present Pandora's rich data set is only being used in-house to attract advertisers who desire a more targeted audience than traditional terrestrial radio provides. However, according to an article in the trade journal *Advertising Age*, Pandora is open to the possibility of using its data to target listeners on other sites or apps. "It's reasonable to infer we would be interested in applying what we know about logged-in users across a network of services", says Pandora's director of product management Jack Krawczyk (as cited in Peterson, 2013). "However we wouldn't approach doing that until all the right privacy measures were in place."

Hispanic listeners and a sub-segment for Spanish-speaking listeners.[140] In order to create these two categories Pandora referred to US census data to locate zip codes with a high percentage of Hispanic or Spanish-speaking residents. It then cross-referenced this information with its user registration data to figure out which listeners fit into this ethnic category. For example, Pandora may have a pool of two million listeners that it knows are Hispanic. By then looking closely at the radio stations listened to by this sample, it can use data science to locate other Hispanic listeners across its user base of 250 million-plus listeners (see Joe, 2014). Pandora's director of product management Jack Krawczyk has claimed that the company's Hispanic and Spanish-speaking listener segments proved to be "at least 10% more accurate than those created based on third-party data" (as cited in Peterson, 2013).

Pandora has been steadily rolling out new ad-targeting segments. In the same interview, Krawczyk said that Pandora has a goal of adding two new segments every four to six weeks. After the initial success with segmenting Hispanic and Spanish-speaking listeners, the plan is to segment listeners with high-household incomes, via the same combination of census data and registered user information (ibid).

However, one should not get the impression that Pandora's data scientists are mostly dependent on publicly available data. For example, Pandora's aforementioned

[140] The popularity of Pandora amongst the Hispanic population in the US no doubt drove this decision. The Hispanic market accounts for 10 million monthly users, or 20 percent of Pandora's total listening audience. What is more, Hispanic listeners are younger, more mobile and more social connected than the average Pandora listener (see Heine, 2012).

survey data has been useful in identifying listeners who are fans of video games. According to Krawcyk "tens of thousands of users" were surveyed, and it was discovered that men between the ages of 18 and 34 years old, who listen to electronic music, were the best targets for video game ads (ibid).

Other relatively simple correlations between age and music listening behavior can provide highly informative insights. For advertisers looking to reach the parents of young children, for example, Pandora can isolate listeners of a certain age and then further segment those who have listened to children's music. Even the child's age can be estimated by factoring in how long it has been since they last listened to a children's station.

**Political Ad Targeting**

As we have already discussed above, music streaming services have made much of the assumption that our taste in music reveals who we really are. It is not a surprise then to learn that the relationship between music taste and political values is a hot topic for music data analysis. The Echo Nest has modeled the relationship between music taste

and political affiliation on their blog,[141] but Pandora has taken this one step further. In early 2014 Pandora launched a new ad service aimed at helping political advertisers target Democrat or a Republican voters.[142]

When registering for a Pandora account, you are not required to divulge your political affiliation. As a result, Pandora must determine this through other means. Pandora first looks at election result data for your zip code, determining whether a particular listener's county leans Republican or Democratic. Pandora has permitted political advertisers to target users based on their zip code since 2011.[143] What is new is how it has begun supplementing that information with information about users' musical tastes and other attributes to create a more valuable profile for advertisers. For example, if you are a staunch country music lover but live in electoral district that leans Democrat, Pandora is able to predict - with between 75 and 80 percent accuracy - that you likely vote Republican (see Dwoskin, 2014).

It is perhaps no surprise that Country music fans lean Republican whereas jazz,

[141] The Echo Nest correlated listening preferences to the political affiliations of music fans in the US. Unsurprisingly perhaps, a fan of the country music singer George Strait is most likely to be a Republican, for example, while Madonna fans skew Democrat. The Beatles were the most difficult band/artist to classify along political lines because, presumably, their music appeals to everyone, from the most ardent Tea Party supporter to Brooklyn hipsters. Clearly, such correlations are more than fodder for interesting dinner conversation as they can help political campaigners identify groups and individuals to target come election time (see Whitman, n.d.).

[142] The pioneer in creating demographic profiles for political advertisers is of course Facebook. During the 2008 US Presidential election, political firms began to target Facebook users by mining the wealth of data users reveal about their interests and location.

[143] In its 2013 Financial Results Conference Call VP of Pandora Dominic Paschel admitted that the political ads don't come without a cost as "the number of calls to customer service goes up dramatically when we accept political ads."

reggae and electronic music fans tend to vote for Democrats. However, genre taste can only reveal so much. Pandora's ability to more precisely locate listeners on the political spectrum is also generated from its ability to look at how diverse a listener's musical tastes are and the type of music they prefer within that range.[144] As Tom Conrad, Pandora's CTO and EVP of product explains:

> We can figure out via a probability model, it's not just what genres you like but how much you prefer them within your listening spectrum…A preference for jazz is only a strong indicator if it takes up around 35% of what you listen to each month. If you have a jazz station but only listen to it 5% of the time, it isn't a good indicator (as cited in Joe, 2014).

**Conclusion: Beyond the Enclosure Analogy**

This chapter has attempted to historicize 'abstract' music streaming space by first telling the story of how radio and peer-to-peer file sharing were made abstract spaces through the institutionalization of metrics. We then examined Spotify's The Echo Nest and Pandora Internet Radio's Music Genome Project in order to better understand the production of abstract space on contemporary music streaming services. The listener and music data analytics performed by these two leading services represents the culmination of almost a century of work identifying, classifying, and segmenting listeners: first on terrestrial radio, more recently on peer-to-peer file sharing services, and now on music

[144] In a 2014 interview with the *Wall Street Journal*, Jack Krawczyk, Pandora's director of product management mentioned that Pandora has learned that "people within higher-income brackets have more eclectic musical tastes than others." As a result, Pandora is planning to offer data about income into a targeted advertising formula, based on the average income in a user's ZIP Code (as cited in Dwoskin, 2014).

streaming platforms.

That the act of listening to music now generates a real-time data feedback loop *could* be described as a process of enclosure: the transformation of a 'lived space' of leisure into a commodified abstract space, serving marketers, major labels and investors. Indeed, in recent years it has become popular to talk about the commodification of virtual space as a "second enclosure" (Boyle, 2003) or a "digital enclosure (Andrejevic 2007, 2009). Digital enclosure, writes Andrejevic (2007, 297) provides us with a way to theorize "the forms of productivity and monitoring facilitated by ubiquitous interactivity."

The monitoring of our music listening practices could thus be seen as a contemporary inflection of the enclosure of common lands that took place in England during the transition to agrarian capitalism hundreds of years ago. Early capitalism emerged out of a historical process that Marx called "primitive accumulation". Before workers could be "free" to sell their labour to capitalists, they first had to be "freed" from any means of sustenance that lay outside of the capitalist economy. As Andrejevic (ibid) relays "[f]ree acquiescence to the surrender of control over one's own productive activity is secured by depriving workers of other options for sustenance – this is the version of freedom that underlies capitalist exchange relations." Andrejevic goes on to point out the spatial reconfigurations that underlay the freedom to enter into the contractual wage relation. "The spatial correlative of the emergence of a 'free' working class in the capitalist era is the formation of clearly bounded, privately owned, and operated enclosures to which worker access is strictly monitored and regulated" (ibid). In other

words, commoners had to be separated from the land so that they could be re-allowed access to it as workers.

How does this apply to so-called "digital enclosures"? Are we compelled to enter into new social relations online? Moreover, if so, what defines these new relations? For Andrejevic (2004), entry into the digital enclosure involves entry into a particular social relation of surveillance or monitoring. As our examination of Spotify (via The Echo Nest) and Pandora above demonstrates, listening to music through a streaming platform instead of buying a record or turning on the radio certainly involves entering into a highly monitored listening space.

However, it would appear at first glance that inclusion, not exclusion is the foundational economic principle on ad-supported music streaming platforms (like with social media services). Spotify, Pandora, etc, attempt to attract as many listeners as possible to their "free" platforms, while maximizing individual listening time in order to increase ad rates. Music streaming services also emphasize, to varying degrees, the social nature of their sites. Last.fm in particular has promoted itself as both a place to listen to music and a place to make and maintain friendships *through* shared love of music.[145]

Nonetheless, as was argued above, we can only understand streaming services as a response to illegal P2P services that came before. In this sense, industry-approved streaming services can be thought of as the privatized land that readmitted digital music

[145] The extent to which 'friendships' on Last.fm or related services represent 'strong ties' or 'weak ties' has been studied and debated (see Baym and Ledbetter, 2009).

listeners – albeit under conditions of surveillance - after they were chased off the P2P "common". To use Arditi's (2012) terms, "market surveillance" follows from, and is dependent on, "repressive surveillance".

Andrejevic also draws a comparison between how both the historical enclosure of English agricultural commons and the process of digital enclosure pre-empts the emergence and survival of alternative spaces. Referring to interactive TV, Andrejevic (2004, 198) writes "(t)o the extent that an interactive digital system becomes the standard for content delivery and not just one more option… viewers lose the ability to choose whether or not to submit to comprehensive monitoring."

While music streaming is the fastest growing sector of the global music industry, and has already achieved mainstream status in the Nordic countries, and in South Korea (IFPI, 2014), at this point, streaming is clearly still "one more option" and not yet "the standard" for music consumption. And while predicting the future of music consumption is always a risky endeavor, we are unlikely to see every last space of music listening enclosed for surveillance and subjected to "the panoptic sort" (Gandy, 1993). This is due to clear differences between physical space and virtual space, and between physical goods like corn, and information goods like digital music. Land, like all physical space (and unlike virtual space), is subject to laws of scarcity. This is one reason why some scholars helpfully distinguish between "the commons" and "the common".[146] Non-

[146] See, for example, Casarino. C. & Negri, A. (2008).

privatized agricultural farmland is an example of the former. *The commons* is finite and characterized by scarcity. On the other hand, structured by a global network of social relations, P2P file sharing services, music blogs and other alternative spaces for online music distribution and consumption, are examples of *the common*. Unlike the agricultural commons, the digital music common is characterized by surplus. What is more, digital music - like all information goods and unlike agricultural goods - are cheap to reproduce and are non-rivalrous (their use does not deplete their use value).

Thus, while the enclosure analogy foregrounds the spatiality of media and helps us to consider continuities between the historical enclosure of physical space and the contemporary enclosure of virtual space, we need to be careful to not draw too tight an analogy between the processes of land enclosure and that of digital enclosure. Furthermore, while the enclosure analogy is helpful to illustrate how capitalism operates through a process of 'accumulation through dispossession' – the physical and juridical expropriation of formerly common spaces - it is less helpful in articulating how the production of capitalist space *itself* proceeds alongside such expropriation. Commercial radio in the 1920s and music streaming platforms in recent years did not simply capture the common. They built new "abstract spaces" both over and alongside existing "social spaces". Andrejevic (2009) recognizes important differences in both history and form when he points out that "land enclosure took an existing resource and privatized it (while) digital enclosures created new private resources." As David Harvey has never tired of pointing out, capitalism has always and everywhere been both parasitic *on* productive spaces and productive *of* new spaces.

Indeed, Harvey has often turned to Lefebvre's spatial trialectic for inspiration and insight over his long and prolific career.[147] Lefebvre's trialectical account of the production of space - as outlined in the previous chapter - presents us with a practical model to examine how both structure and agency work to produce space. Importantly, power should not be understood as existing outside to the spatial trialetic.[148] Power is immanent. Capitalism did not sail in from distant shores in order to subsume the virgin lands of early peer-to-peer file sharing sites. The spatial trialectic, in other words, is not the means through which 'social space' is produced only to be subsequently hijacked by capitalist 'abstract space'. Rather the spatial trialectic is the process *through* which space-power relations are produced. As Dale Bradley (1999, 152) astutely explains, "the production of power relations is always and everywhere co-terminate with the production of space."

Lefebvre's trialectics of space thus provides us with an immanent critique of power, which escapes the problematic representation of capitalism as an external force that seeks to capture the common through enclosure. Jodi Dean (2014, 6) for example writes, "…enclosure is an operation through which what is common is seized and put into service for capitalism". However, this sort of allusion to capitalist capture fails to

[147] See for example Harvey 1989, 218-221.
[148] However, some interpreters of Lefebvre's work (see Bradley, 1999) have argued that Lefebvre remains tied too closely to a legal economic model of power that portrays power as emitting from an external source and which ultimately remains at odds with his spatial trialectic. Bradley thus prefers to compliment Lefebvre's theory of spatial production with a more immanent theory of power derived from Foucault.

represent how the commodification of space is always much more contested, open-ended, and indeed, dependent on social space than it may appear to be at first glance.

Our examination of data mining of listener behavior on Spotify and Pandora reveals much more than a simple tale of 'social space' being swallowed up by 'abstract space'. Media capitalists depend on social space, for there would be nothing to abstract from if it disappeared. Social space is thus altered, though never extinguished by abstract space. In order to better understand how abstract space is produced, *out of*, and *through* social space, we need to be sensitive to the trialectical tensions between *perceived*, *conceived* and *lived* dimensions of space on music streaming services. This is our task in the chapter that follows.

## Chapter 7: The Trialectics of Music Streaming Space

In this chapter, I will examine in detail how music streaming services and their listeners produce new spaces of music consumption through the lens of Lefebvre's trialectical model. As explained in Chapter 4, Lefebvre argues that every space – social or abstract - is produced trialectically through material "spatial practice" [space as *perceived* through our senses], "representations of space" [space as *conceived*] and "representational spaces" [space as *lived*]. By focusing on the interplay between perceived, conceived and lived dimensions of music streaming space we are better able to grasp how the production of abstract space for rent extraction is not so much the end result of (digital) enclosure, but rather an ongoing, conflicted process. Thus, in what follows, I attempt to demonstrate how Lefebvre's trialectical approach can help us to better understand the mutually constitutive processes that produce digital spaces in general, and in particular, the production of new abstract spaces surrounding digital music.

The first half of this chapter demonstrates the advantages of this trialectical approach by drawing on examples from across the music streaming landscape. In the second half of the chapter, I turn to a case study that focuses specifically on the popular audio platform 'SoundCloud', which is currently undergoing a controversial and contested transformation as it attempts to better serve the aims of its investors and the major record labels.

**Space as Perceived**

We begin our trialectical analysis of the production of music streaming space with 'perceived space'. This phenomenological dimension of spatial production refers to aspects of space that can be grasped by the senses. As Schmid (2008, 39-40) explains "(i)t comprises everything that presents itself to the senses; not only seeing but hearing, smelling, touching, tasting."

As a Marxist, Lefebvre was careful to offer a qualified phenomenological approach (see Lefebvre, 1991, 183). Thus, perception for Lefebvre "not only takes place in the mind but is based on a concrete, produced materiality" (ibid, 38). Lefebvre describes how "(t)his sensuously perceptible aspect of space directly relates to the materiality of the "elements" that constitute 'space'" (ibid, 39).[149] In relation to the example I gave in Chapter 4 of a high school classroom, we could include the structural elements that are perceived visually and tactilely (four walls, ceiling, desks, seats, lectern, etc.) but also the aural characteristics of this classroom (the sound of students whispering, the shuffle of books, etc.).

To apply this dimension to the production of digital spaces, and in particular music streaming services, helps to remind us directly of the materiality of 'cyberspace'. Immediately our attention is drawn to the interface of the particular technologies we use

[149] For Lefebvre "spatial design itself is one aspect of the productive forces of society – to be considered along with technology, human knowledge, and labor power as contributing to our "productive potential" (Gottdiener, 1994, 123).

to access streaming services. The interface is where body and machine meet. For Drucker (2011, 10) the interface is "not so much a 'between' space as it is the mediating environment that makes the experience, a 'critical zone that constitutes a user experience'."[150] In taking a Lefebvrian approach to space it would be misguided to see the interface as *the* space however. Instead, we need to ask ourselves how the interface is designed in order to be perceived, and the role this may play in the production of social or abstract space.[151]

The first music streaming services were designed for the personal computer. Listeners accessed the service while seated, directly facing their screens, at home or in the office. Whether on a desktop computer or a laptop, the relatively generous screen "real estate" afforded the display of a rich array of graphic icons and menus, enabling the user to easily and intuitively navigate the service through the standard WIMP interface. On the personal computer therefore, *perceived* space is heavily biased towards visual perception.

As already discussed, a distinction can be made between two general types of music streaming services. The first category includes Pandora Internet Radio, Clear

[150] The interface is where computational power reveals its inner workings to the user: where 'immaterial' data is materialized and interpreted by the user. However, the interface is not simply a portal *to* information. "(T)he structure of an interface *is* information, not merely a means of access to it" (Drucker 2011, 10).

[151] Lefebvre (1991) argued that spatial design should be considered as one of the productive forces of capitalism. He was of course speaking of urban design and how it guides people through the city, or shapes the way shoppers move through a shopping mall, for example (see Gottdiener 1986). Nevertheless, we can translate this insight to digital spaces. Web design is similarly crucial in guiding users through the internet.

Channel's iHeartRadio, 8tracks, Songza, Slacker and other 'Internet Radio' services. The heir to traditional broadcast radio, these services are designed for a "lean-back" experience. For example, Pandora Internet Radio presents listeners with a sleek layout designed to simplify interaction. On the other hand, on Spotify, Rdio, Deezer and other 'on-demand' streaming services, the listener actively shapes the layout of the interface: building personal playlists, downloading apps, and following friends. In short, these services are designed for a "lean-forward" experience.

When we contrast streaming services by describing them as either 'lean-forward' or 'lean-back' we immediately draw attention to how the interface summons and positions the listener's body. Within the seemingly innocent descriptions of "lean-forward" and "lean-back" we can detect a particular '*conceived* space', one that proposes an ideal mode of attention: active versus passive. Richardson (2010) reminds us, the "embodied orientation we have towards different kinds of media interfaces, and the immersive investment of the eyes, ears and hands required of interactive screens" partially determines how much, and what type of attention we pay to any service. This has important implications for how successful a streaming service is in producing "abstract space". It influences how much advertisers are willing to pay to reach listeners,

as attention is the currency of all commercial media.[152]

However, there is an inherent and obvious problem in trying to capture the *visual* attention of *listeners*. Music is used by most listeners to produce an environment. Rather than confront the listener face-to-face, music envelops the listener. As Frances Dyson (2009, 4) puts it "sound surrounds".[153]

We listen to music through streaming services typically while working on other projects, messaging friends, or performing a myriad of other day-to-day tasks. After setting up a playlist and hitting play, the streaming service window is minimized to focus visual attention on the task at hand.[154] The perceived space of streaming services, in *practice*, thus shifts from a visual to an aural bias.

Given this, streaming services and their advertisers are working hard to create personalized soundscapes that fuse music and marketing. We can look to the popular Spotify application 'Moodagent' for one interesting example of this attempt to produce aural 'abstract space' on streaming services. Moodagent delivers mood-based playlists. The service claims to have "the world's most extensive collection of mood data" which they say enables them "to precisely decode the exact mood of any given track" (PRWeb,

[152] Of course, actual 'lived space' might digress from such prescriptions. A Spotify listener may queue up several albums and 'lean back' from the screen for a couple of hours. A Pandora user may 'lean forward' intensely interested in every track the service chooses to play, providing thumb feedback for each. What should interest us here is how 'ideal listening' for each type of service shapes debates about royalty rates and the advertising rents that can be in turn extracted.

[153] Cultural theorists have long argued that music is the most powerful affective agency in human life. As Lawrence Grossberg (1992, 153) puts it, musical environments can "determine the sorts of investments we make and the activities we undertake in their musically constructed space."

[154] We can see here the interplay, and tension, between perceived space and lived space.

2012). For brands who want to advertise on streaming services, Moodagent is useful because it allows a brand to choose a specific song that "embod(ies) the essence of their message." The brand can then have their ads played only when a listener is enjoying songs with similar emotional data and characteristics (ibid). In short, Moodagent helps advertisers target their message to distinct emotional profiles. Brands are able to target such moods and emotions as 'Happy', 'Sad', 'Angry', 'Tender', 'Sensual', 'Fear', and varied levels of each. Moodagent, and advertisers who employ their service, are hoping that with "the resulting 'vulnerability' a listener is subject to through music, brands and advertisers would be provided an advantageous (and subconscious) platform for the receiving of their marketing message" (Dahud 2012). The goal is to deliver ads with a message or a tone that does not clash with a listener's identity, mood or state of mind. As the CEO of Moodagent's advertising partner Mixberry Media notes "(t)he positive reception and retention of the advertiser's message has a lot to do with the consumer mood" (ibid.). In short, applications like Moodagent help '*perceived* space' on streaming services adapt itself to '*lived* space' in order to produce abstract space.

The rapid adoption of mobile devices - in particular smart phones - has further transformed the 'perceived space' of streaming services.[155] First of all, mobile streaming has taken listening out of the home or office. Continuing in the tradition of the Sony Walkman and the Apple Ipod, mobile streaming listeners can re-claim *lived* space

[155] According to Pandora's Chief Financial Officer Mike Herring, Pandora reached the inflection point at which the revenue from audio ads began to eclipse its traditional visual ads sometime in mid-2013.

through privatizing the public realm (Bull 2005, 354). At the same time however, the perceived space of mobile streaming must necessarily contend with new environments and the competition for attention that listening in public space introduces. From the glare of the sun on a screen to the roar of traffic, we are reminded once again, that 'digital space' is always embedded in, and interwoven with, 'physical space'. Moving beyond the theoretical implications already discussed in Chapter 4, we now need to ask how the shift to mobile streaming - bringing private streaming into public spaces - has affected strategies for producing abstract space.

On the one hand, mobile presents significant challenges to streaming services in terms of creating abstract space. Consider the fact that smart phones spend a lot of time in pockets. This alters a listener's embodied orientation to the device music is being streamed on. In particular, it further reduces visual interaction with the screen. For ad-supported streaming services this has significant implications. On the personal computer, the relatively generous screen size permits the display of banner ads. Banner ads however, are of little use on mobile devices as mobile users are about half as likely to click on ads as listeners accessing a service on their computer (Jablonski 2011). One result is that streaming services have attempted to shift from displaying banner ads to playing more audio ads. In place of click-through metrics, solutions such as hands-free,

voice activated engagement ads have been developed.[156] However, this has not been a seamless transition. As listeners adopt new technology and spread their listening across devices, Pandora must convince advertisers that they are keeping their eye on these listeners and delivering interface-appropriate ads.[157] As Pandora mentioned in their 2014 Annual Report: "…our audio and video advertising products are relatively new and have not been as widely accepted by advertisers as our traditional display ads. In addition, the introduction of audio advertising places us in more direct competition with terrestrial radio…" (Pandora, 2014).

Mobile listening, and device fragmentation in general, also provide streaming services with opportunities: specifically the opportunity to collect far greater contextual information on listeners. In other words, mobile provides streaming services with unique insights into the 'lived space' of listeners, as we will discuss in more detail below. First however, let us turn to the second dimension of Lefebvre's trialectic: '*conceived* space'.

[156] For example, the company XAPPmedia provides interactive audio ads that allow listeners to verbally respond to advertised offers.

[157] Like all internet services, Pandora Internet Radio has had to manage the technical problem of delivering a seamless experience across operating systems and devices. Pandora can be streamed from desktop computers, from mobile phones or tablets, from car audio systems, from satellite boxes and from Blu-ray players. In order to take advantage of fragmentation, Pandora had to standardize how it permitted consumer electronics partners to provide access to Pandora. Previously, Pandora simply provided them with their application programming interface (API) and then these partners developed applications themselves. In the new model "connected devices link with Pandora's browser, which delivers an interface appropriate to whichever device the consumer is using" (Joe, 2014). What this means is that Pandora has full control over how its service is presented. As Ian Geller, VP of business development for Pandora says "We have control over the application…We know what people are doing in that particular time and there's no disparity between what the client knows and what the server knows" (ibid.).

**Space as Conceived**

As Christian Schmid (2008, 39) writes "(s)pace cannot be perceived as such without having been conceived in thought previously." It was mentioned earlier in this chapter that Internet radio services, such as Pandora, are generally conceived of as successors to broadcast or terrestrial radio. On the other hand, on-demand services, such as Spotify, conjure up the space of the record store.[158] This has implications for the relative acceptance of advertising on either type of service, expectations of attention (active/passive) and the degree of listener control. As a result, when a service contravenes such conceptions and expectations, listener resistance - as we will discuss with reference to SoundCloud later in this chapter - can be strong.

When Lefebvre refers to "conceived space" however, he is generally referring to the dominant "representations of space" that 'secrete' society's spaces. Lefebvre identifies conceived space with certain groups in society. Conceived space is "the space of scientists, planners, urbanists, technocratic subdividers and social engineers…" (Lefebvre 1991, 38).

Digital space is likewise conceived of by select groups of increasingly more powerful specialists - coders, graphic designers, programmers, and engineers - who are tasked with "valorizing, quantifying, and administering" (Ronneberger 2008, 137) these

[158] An advertisement for the on-demand streaming service 'Rdio' explicitly attempts to make this connection. (see Rdio: Unlimited Music Everywhere. (n.d.). Retrieved December 29, 2014, from https://www.youtube.com/watch?v=wksIZuOxf_0 )

spaces. Just as the Cartesian understanding of space as calculable and controllable shaped modern day spatial planning, so too is knowledge enlisted to structure digital space, to impose 'order' on preexisting social spaces (ie. file sharing services).

The dimension of "conceived space", thus, provides us with an entry point to examine the ideological importance of 'big data' and 'datafication' for music streaming services. For Jose van Dijck, datafication is rooted in the ideology of 'dataism', which "shows characteristics of a widespread *belief* in the objective quantification and potential tracking of all kinds of human behavior and sociality through online media technologies" (2014, 198). Despite its assumed neutrality or objectivity though, datafication does not so much represent, it *re*-presents.[159] By choosing to measure certain attributes rather than others, and to classify and segment listeners into predetermined consumer categories – as described in the previous chapter - music streaming services create the subjects and the spaces they seek to measure (Arditi, 2012, 201).

Music streaming space is not only horizontally segmented via consumer categories however, it is also vertically ordered via hierarchies of listener value and projections of future worth. Pandora for example, has learned that listeners who exhibit

[159] Lefebvre repeatedly emphasizes that, despite abstraction's apparent lack of substantive content, "*there is a violence intrinsic to abstraction*, and to abstraction's practical (social) use" (Lefebvre 1991, 289) which is in fact directly related to the apparent political neutrality of its representations (Wilson, 2013, 370). Or, as Oscar Gandy (1993) writes in *The Panoptic Sort.* "Differences not measured, for all intents and purposes, are differences that do not exist; clearly, they are differences that do not matter".

more eclectic music tastes, tend to also have higher incomes than the average listener.[160] The ability to draw correlations between taste and class is something that scholars - most notably Pierre Bourdieu (1984) – have debated for years. "[N]othing more clearly affirms one's 'class', nothing more infallibly classifies, than tastes in music" wrote Bourdieu (1984, 18) in *Distinction*. Pandora is, of course, not so much interested in the theoretical implications of such claims, but rather in increasing ad rates. According to the anthropologist Nick Seaver, Pandora applies a diversity metric to rank the range of a particular listener's music taste. "A higher diversity score", remarks Seaver, "should indicate a higher social status, which means that these listeners can have more expensive ads sold against them" (as cited in Harvey, 2014).

What is more, listeners who are classified as more likely to provide long-term value to a service are treated differently from those who are deemed "waste". One of the problems facing the music streaming sector is that the bulk of ad-supported accounts on services like Spotify, Pandora, and Deezer are inactive.[161] This means, of course, that only a small minority of listeners contribute advertising value to such streaming

[160] This supports the claim made in a classic paper called "Changing highbrow taste: from snob to omnivore", by Peterson and Kern (1996). The authors argue that when it comes to music consumption, "highbrows" are more omnivorous than others, and that they have become increasingly omnivorous over time. Interestingly, Nick Seaver has discovered during his PhD research that Peterson and Kern's work is familiar to Pandora's advertising department (see Harvey, 2014).

[161] A study conducted by MIDiA Consulting suggests that on ad-supported music services in 2012 between 60 and 80 percent of accounts were essentially inactive accounts (cited in The Echo Nest, 2013a, 2).

services.[162] These are the "committed, engaged" listeners - referred to by the Echo Nest as "high value listeners" - who must be distinguished from the "'low-value' tourists who disappear from sight" (ibid). In developing a method to identify and represent which category listeners fit into, the Echo Nest claims that it can then help music streaming services "execute strategies focused specifically on acquiring, engaging, and maximizing the ARPU (average revenue per user) of the likely high-value users" (ibid).

Essentially this is accomplished in two ways. First, the music artists that correlate with high-value users, and those artists correlated with users less likely to stay with the service, are identified.[163] A particular user's approximate future value can then be identified by the artists s/he listens to.[164] Second, the patterns of musical behavior that best predict high-value listeners are isolated. These patterns are organized into five categories that describe listener behavior. According to a company white paper these five categories, or 'Taste Profile Attributes' (TPA) are:

[162] A similar discovery is being made across diverse sectors McCourt and Burkart (2011, 262) give the example of a bank that "discovered that 20 percent of its customers created all of its revenues, while the other 80 percent were 'destroying value' through the labor costs required to process their transactions." One thing that unites all such sectors is the attempt to employ analytics to separate high value customers from the rest.

[163] In a demonstration for an unidentified "partner service", The Echo Nest determined that the "High-value" artists for this service were: Florence + The Machine, Bon Iver, fun., Kid Cudi, Ed Sheeran, The Kooks, Of Monsters and Men, Angus & Julia Stone, The Naked And Famous, and The Black Keys. "Low-value" artists for this service were: Katy Perry, Lil Wayne, Red Hot Chili Peppers, Train, Benjamin Francis Leftwich, Hans Zimmer, Wale, Rusted Root, Swedish House Mafia, and The Wanted. (The Echo Nest 2013a, 3)

[164] The Echo Nest also shows music streaming services how to employ this knowledge to attract and retain high-value listeners by, for example, promoting "high-value" artists (artists most closely associated with high value listeners) through homepage recommendations and in their marketing.

> • 'Adventurousness': how open the listener is to music outside their "musical comfort zone."
> • 'Diversity': how varied the listener's preferred styles and genres are.
> • 'Freshness': the listener's relative preference for new and recent artists vs. older music.
> • 'Locality': the relative spread, worldwide, of where the listener's preferred artists come from.
> • 'Mainstreamness': the listener's affinity for well-known artists vs. obscure artists
> (from The Echo Nest, 2013a, 4)[165]

The claim made by The Echo Nest is that, on the basis of such musical data, they can help a music service:

> (i) Predict each user's future value to the service.
> (ii) Identify musical characteristics of high-value listeners to help the service tailor user experience towards the high-value group.
> (iii) Identify psychographic / affinity characteristics of high value listeners to help the service monetize that group via targeted advertising
> (ibid, 2).

'Taste Profile Attributes' (TPA) help a music streaming service figure out who high-value listeners will be early on so that they can be proactively focused on, in place of those listeners who will contribute little advertising value to a service. This is what communications scholar Joseph Turow (2008, 1) describes as "marketing discrimination", whereby "marketers increasingly use computer technologies to generate ever-more-carefully defined customer categories – or niches – that tag consumers as

[165] The Echo Nest acknowledges that different services, having different users, will need to determine the relative importance of each these attributes in distinguishing between 'high value' and 'low-value' listeners. Thus, the TPA can be tuned to deliver the specific parameters ("more adventurous," "less mainstream," "more diverse," etc.). Depending on the service, The Echo Nest can also adjust the relative value of music listening behavior, for example prioritizing purchases over shares for services that also sell Mp3s.

desirable or undesirable for their business."[166]

The Echo Nest recommends that streaming services create a Taste Profile for a new user as soon as they register as "…services can predict from just a few data points whether that user is likely to be a future high-value listener or not" (ibid). Even before a profile can be built for a new user though, The Echo Nest's Mobile software development tools can predict a user's value by looking at the music in their mobile library and the particular device they are accessing the service through. As co-founder and CTO Brian Whitman has revealed in an interview "even the fact that you are using an iPhone instead of an Android we know a lot more about your music taste. It's low level signals that definitely when combined tell you a lot" (as cited in White, 2014).

Once a streaming service is able to identify a listener's value, and separate "high value" listeners from "low value" listeners, the next step is once again to create and identify interest and affinity segments for the high value listeners. The Echo Nest has developed a set of affinity models to do just this.[167] The benefit to music streaming services is obvious: brands and advertisers that match the lifestyle interests and affinities of high value listeners will pay higher ad rates (rents) in order to be granted admission to

[166] Marketers commonly use the terms "targets" and "waste" to distinguish between these two sets of consumers.

[167] In a company white paper, The Echo Nest reported on an exercise conducted for one of its partner music streaming services. The task was to identify the interests and affinities of this particular service's highest value users. The interests and affinities most closely related to these users were social causes, concerts, alcohol, green/eco, outdoor adventure, and fashion & style. This of course is information highly valuable to the service, and any potential advertiser interested in promoting their products or services (see The Echo Nest, 2013a, 5).

the most valuable listener spaces.

The Echo Nest's TPA is merely one "discriminatory technology" in a vast and growing army of sorting techniques, which operate by allocating options and opportunities through data analytics. What Oscar Gandy (1993, 15) has called "the panoptic sort" - "a difference machine that sorts individuals into categories and classes on the basis of routine measurements" - functions through an integrated process of *identification*, *classification*, and *assessment*.[168] The Echo Nest's TPA too works to *identify* specific listeners by closely monitoring their music tastes and listening behavior. It then *classifies* them as either "high value" or "low value" listeners. Finally, those deemed worthy of further attention are *assessed* in comparison to other listeners and the consumer brands that they are judged to have affinity with.

In such a highly competitive sector, music streaming services are all attempting to distinguish themselves through data analytics.[169] Guided by an ideology of 'dataism', data analytics firms such as the Echo Nest are to music streaming space what planners,

[168] In his classic book *The Panoptic Sort* (1993) Oscar Gandy develops a political economy of personal information guided by Foucault's concept of panopticism. Panopticism, Foucault wrote "is a type of location of bodies in space, of distribution of individuals in relation to one another, of hierarchical organization, of disposition of centres and channels of power, of definition of the instruments and modes of intervention of power, which can be implemented in hospitals, workshops, schools and prisons" (Foucault, 1979, p. 205; in Gandy, 1993, 23). Gandy takes aim at the wide array of technologies, and the logic that guides their deployment in coordinating and controlling everyday access to goods and services. For Gandy (1993, 2) the operation of the panoptic sort "increases the ability of organized interests, whether they are selling shoes, toothpaste, or political platforms, to identify, isolate, and communicate differentially with individuals in order to increase their influence over how consumers make selections among these options."

[169] Since Spotify acquired the Echo Nest in March, 2014, Pandora has purchased the music analytics firm Next Big Sound, and in preparation for the launch of its own streaming service, Apple bought Semetric – the startup behind the music analytics service Musicmetric.

urbanists, technocratic subdividers and social engineers are to urban space. In short, they *conceive* (of) music streaming spaces, as hierarchically organized and segmented via consumer categories.

**Space as Lived**

Lefebvre was particularly critical of the domination that *conceived* space has over space as *lived*. Indeed, he argued that this domination has been essential not only for the production of 'abstract space', but also for the very survival of capitalism. The survival of any music streaming services is likewise dependent, in part, on their ability to increasingly re-present the lived space.

I mentioned earlier that the shift towards streaming music from mobile devices has provided evermore insights into the lived space of listeners. Streaming services attempt to take advantage of such insight by delivering more precisely targeted music and advertisements. The crux for successful music and advertising correlation is understanding the context the listening is taking place within. Research conducted by psychology professor Adrian North suggests that people's music selection is closely connected to what they're doing. For example, while commuting, people tend to listen to music that provides something of a "safe haven".

On streaming services, all this occurs in the background without the listener's input. While Spotify already knows a great deal about its users' *lived* space, they are learning more all the time. "We track user behavior throughout the day," explains Gary Liu, head of Spotify Labs:

> If users are listening to, say, electronic dance music every morning, early in the morning, Spotify can be pretty certain that the user is running or exercising, and depending on the frequency and repetition of listening habits, we can know precisely the best time to serve an ad related to fitness (Liu, quoted in Rowley, 2014).[170]

As one's environment changes, and as the day proceeds, one's experience of the streaming service will also shift.[171] For example, Spotify users have created more than 400,000 barbecue-themed playlists. When a user chooses to play one of these playlists, they are signaling to Spotify that they are most likely outside, with others, enjoying a BBQ. This would likely be a good time to play a beer commercial, rather than that message from PETA.

Over the years that it has been collecting data on listener behavior, Pandora Internet Radio has also learned that context is very important to music taste. "People listen to different music in their car versus their mobile device," says Eric Bieschke, Pandora Chief Scientist & VP of Playlists. "What people want to hear in the morning when they're at the gym is different than what they listen to at home in the evening" (cited in Diallo, 2013). This type of contextual insight is particularly essential for

[170] Increasingly, wearable 'smart' devices will provide continuous data on behavior and context. Spotify has indicated that they are interested in developing ways to monitor heart rates and sleeping patterns of listeners so as to more accurately recommend music - and ads of course - that correspond to bodily states (Smith, 2014).

[171] As flat screen TVs and home theater speakers have become more popular, increasingly people are listening to music in their living room on their TVs rather than their stereos. In early recognition of this trend Pandora designed a new platform - tv.pandora.com - designed for listeners to who wish to stream Pandora more easily over televisions, initially via Xbox 360 and Playstation 3. In late 2013, Pandora announced that the service would be available on Chromecast, Google's TV-connected device. Pandora users are able to use their smartphone or tablet as the remote control. The company claims that more than 10 million listeners have streamed Pandora on their internet-connected television (see Conrad, 2013).

advertising-dependent services such as Pandora.[172] For example, an ad that asks the listener to call a certain number is wasted on someone listening to Pandora driving down the freeway.[173] Pandora not only wants to know when that driver is in her car but also when she arrives home, and switches on the TV to continue listening to Pandora in her living room.[174] In this scenario, if her husband thumbs down one of her favorite songs, Pandora understands at that moment that it needs to deliver ads more appropriate for a couple listening at home.

Paul Lamere, director of developer platforms at The Echo Nest has been explored the idea of what he calls the Zero UI Project. "The ideal music player has zero buttons," he says. "When you get in your car, it automatically starts playing NPR. When you come home, it knows if your wife is home: if she is, it plays jazz on the stereo, and if not, it puts on death metal" (as cited in Brownlee, 2014). The goal, as he describes it, is to create a music player that knows precisely what music to play for any listener given their current context. The challenge, however, is to glean enough information from the listener,

[172] As discussed earlier, the company has had difficulty growing the revenue it derives from advertising as quickly as it grows it listener base. Pandora must continuously increase its advertising revenues as it adds new listeners because it is required to pay royalties to Soundexchange for every single stream of a song.
[173] Not surprising given the long love affair between radio and the automobile, it is the driving experience that Pandora is focusing on for the coming years. Internet access in the car is only in its first chapter, with drivers generally connecting their phones to the network via USB or Bluetooth. However, Pandora and other similar services have been quite successful in persuading automakers to offer built-in connection. In its 2013 Financial Results Conference Call, it was noted that Pandora is now available on 9 out of 10 of the best-selling vehicles.
[174] With the growing popularity of streaming Pandora over television, the company must now find a way to best deliver ads for this new format. "…you can imagine us experimenting with more visually contextually appropriate advertising on a TV," VP of business development Ian Geller explained in an interview. "Why should a TV just play audio ads? It's a TV" (as cited in Joe, 2014).

without them needed to actively tell the service what they want to hear. Implicit signals such as "[e]very time a listener adjusts the volume on the player, every time they skip a song, every time they search for an artist, or whenever they abandon a listening session" (Lamere, 2014), must therefore be enough to reveal the listener's music taste.

Smartphones are, and will be, the critical tool through which to harvest implicit signals that aid in generating contextual knowledge. "If you look where the music industry is going, music in the future will be played almost entirely on people's phones," Lamere told *Fast Company,* "And your phone knows a lot about you":

> My phone is connected to a music service with 25 million songs. It 'knows' in great detail what music I like and what I don't like. It knows some basic info about me such as my age and sex. It knows where I am[175], and what I am doing – whether I'm working, driving, doing chores or just waking up. It knows my context – the time of day, the day of the week, today's weather, and my schedule. It knows that I'm late for my upcoming lunch meeting and it even might even know the favorite music of the people I'm having lunch with (Lamere, 2014).

In short, our mobile listening devices will soon be capable of knowing what you are doing, who you're doing it with, and more. The Echo Nest cofounder Brian Whitman suggests that the future of listener understanding and segmentation will get deeper into how, when and where people actually interact with music. As he noted at a talk at

[175] However, as the IAB states in their Interactive Advertising Guide: "IP-based geo-targeting is commonly used for local advertisers to reach their audience; however, with only 25-50 miles of accuracy it is really only effective for regional advertisers to reach users at a DMA level. Similarly, Behavioral Targeting is frequently used to estimate a user's location, but inferred location is still far from accurate for most local advertisers. While techniques continue to evolve one thing is certain: a huge opportunity exists for local advertising online. With a large percentage of consumer spend happening within a few miles of the home, there is incredible incentive for the online ecosystem to continue to search for better tools to drive local advertising." - See more at: http://www.iab.net/guidelines/508676/targeting_local#sthash.hjeBUwD9.dpuf

Microsoft, "not just what they skip, ban and recommend, but when? Did they just break up with their girlfriend?" (as cited in Vanderbilt, 2014). An article in *Fast Company* went even further, musing that "the possibilities are limitless":

> … in the future, Rdio or Spotify could communicate with wearable devices such as the *iWatch*[176] or a future *Jawbone Up* to take your pulse and adjust the BPMs of your playlist to match when it detects you're at the gym. And using similar techniques to do what IBM is doing with the linguistic analysis of social media to create psychic Twitter bots, the zero UI music player of the future might stalk you on Facebook or Twitter to see what your mood is, and adjust the music it plays you accordingly (Brownlee, 2014).

However, it would be wrong to portray this as a story of continuous enclosure: a depressing tale of how lived space slowly becomes enfolded into the designs of big data monetization. *Lived* space, as Michael Gardiner (2000, 75) explains, is "where essential human desires, powers and potentialities are initially formulated, developed and realized concretely." Listeners on streaming services actively construct playlists and program their own personalized radio streams. They tag and organize music on these services. They follow other streaming service users and share music. On services such as SoundCloud, they actively collaborate on music production by providing feedback and remixing music. Through such everyday lived practices, streaming users continuously contribute to reinvigorating the *social* spaces of music streaming services.

Most of these practices represent the continuation and online adaptation of practices that have long been central to music fandom. For instance, consider the act of

[176] In April 2014 Pandora Internet Radio announced that it was now available through the Pebble Smartwatch; the first wearable technology device that the popular streaming service is available on.

sharing music. Music fans have always shared music between themselves. Whether swapping mix tapes or recommending obscure indie bands to friends, sharing music has always been central to the circulation of music and the creation and maintenance of music communities. Sharing is also a communicative act, through which a listener's tastes and preferences are made public. Not only does music circulate, but so does 'cultural capital'.

However, significant contradictions emerge when abstractions dictated by data analytics collide with everyday music-based practices. For example, when Spotify first entered the US market in 2011, it required all new users to sign in through their Facebook account.[177] Spotify's integration with the social media giant also meant that any song you streamed would automatically be listed on your Facebook wall for all your friends to see.[178] Spotify enthused that this feature "will help everyone to discover more free music than ever before" (Cionci, 2011).

Music streaming services like Spotify promote the 'social' aspect of their services in order to coax listeners to spend more time on their platforms and reveal more data about themselves.[179] Signing up via Facebook allows Spotify to seamlessly gain access to valuable information from a new user. This includes the new users' name, gender, profile picture, birthday, a list of all of his/her friends, user ID, email address, and any other

[177] Listeners who visited the Spotify homepage were greeted with the following message: 'You need a Facebook account to register for Spotify. If you have an account, just log in below to register. If you don't have a Facebook account, get one by clicking the 'create an account' link below.'
[178] Listeners could turn off this option manually in Spotify's Preferences menu.
[179] Listeners who linked their Spotify accounts to Facebook were also three times more likely to become paying subscribers to the streaming service (Dredge 2012).

information the user has made public on Facebook.[180] This 'sharing' is the very appeal of the service to advertisers, as it allows them to create a "social graph" which they can then use to pinpoint their ads precisely at particular peer groups at particular times. As Napster co-founder and Facebook shareholder Sean Parker stated: "The dream with Spotify was to ultimately integrate Facebook and Spotify so that that viral distribution of the social graph could be unlocked and that power could be brought to bear for the music industry" (cited in Carroll and Knight, 2011). From Spotify's perspective, in connecting itself to Facebook and Twitter, Spotify is able to integrate its social features into already well-established networks rather than having to build these networks itself from the ground up.[181]

However, deep integration of this sort with Facebook was quite controversial and unpopular amongst Spotify users, as can be seen in the comments section of technology discussion forums across the web. As one commenter wrote on *Hacker News*: "I am sick of everything being social. I listen to and read things I enjoy and often don't want to share it with the whole world…I don't want the whole world to know I am listening to jazz

[180] Furthermore, according to a Pew Research Center study, 67 percent of social media users around the world share their opinions about music and movies on social media sites (Pew Research Center. 2012).
[181] Gaining insight into the music tastes and listening behavior of its users is also critical for Facebook's business. Music, is a central component of Facebook's Open Graph strategy - an initiative that encourages developers to create applications that let people share movies, books, news articles, and of course music. "Music is such a great example of the (Open Graph)", commented former Facebook CTO Bret Taylor, "because it's uniquely tied to people's identities" (Levy 2011). By gaining access and logging the listening habits of its users, Facebook gets a better sense of *who* you are and *how* you are related to other Facebook users. As the tech journalist Eliot Van Buskirk (2011) writes: "(i)f your listening habits influence your friends, Facebook knows about it — and also understands that ads targeted to you are more valuable. You're what the marketing types call a 'tastemaker'."

radio at the moment."[182]

It seems that the desire to share cherished music is always matched by the desire to maintain some degree of control over publicizing personal listening habits.[183] As scholars of popular music (ie. Frith 1996), have long demonstrated, we use music not only for pleasure but also to construct our identities. Indeed, there is often a yawning gap between the music that gives us pleasure, and the music we use to project our identity to others. In short, there are two types of music: the music we listen to, and the music we tell *say* we listen to.

By choosing to ignore this fundamental fact in order to fulfill its data mining dictates, Spotify and Facebook provoked a backlash. After just one week, Spotify was forced to respond to the growing chorus of complaints over their automatic sharing function. Spotify CEO Daniel Ek made reference to the backlash by tweeting "… we value feedback and will make changes based on it" (Ek, 2011). The service was soon updated to include a "Private Session" function that allows users to control when the music they are listening to will appear on their Facebook feed. In short, Spotify adapted their service to the *lived* dimension of everyday social space.

[182] A comment from "wastedbrains" on the comment thread at 'Hacker News' under the heading "Spotify now requires a Facebook account to sign up" (available at https://news.ycombinator.com/item?id=3038815)

[183] Importantly, streaming services claim no responsibility for how your data is used by third parties such as Facebook. For example, Pandora Internet Radio's privacy policy states, "These service partners may have their own data collection, use, and sharing practices that may also be applicable to your personal information. You should review their applicable privacy policies and methods for changing the privacy or sharing settings on such services" (Pandora, 2013).

According to Edward Soja (1996, 68), Lefebvre saw 'lived space' as "a strategic location from which to encompass, understand, and potentially transform all spaces simultaneously."[184] Nonetheless, we can see the importance of Lefebvre's trialectical approach in this example of resistance to Spotify/Facebook integration. While Spotify adapted its service to the 'lived space' of its listeners, Spotify's new 'Private Session' mode was designed as 'opt in' instead of 'opt out'. This privacy function also had to be activated *each* listening session, or sharing would be automatically enabled again the next time the listener logged in. Recognizing that publishing one's music-listening habits to Facebook is a key part of Spotify's business strategy, one technology commentator called this a "clever move from Spotify" (Van Buskirk, 2011b).

A year later Spotify made it no longer mandatory that listeners have a Facebook account in order to sign up to the music streaming service. Again, protests by listeners seem to have swayed Spotify.[185] However, Spotify's new registration page still boldly displayed the Facebook login button at eye-level on the top of the page, while the new email registration option was hidden in light grey font at the bottom of the page (Jones, 2012). Clearly, Spotify was attempting to placate concerned listeners while

[184] Not everyone agrees on such a reading of Lefebvre. In a carefully developed exposition of Lefebvre's three-dimensional dialectic, Christian Schmid (2008) admonishes Soja for singling out lived space, or what Soja calls "thirdspace". Schmid convincingly reminds us that the dialectical model that Lefebvre follows looses all analytical force if it is carved up into independent spaces, some spaces privileged over others.
[185] For example see the comment thread under the heading 'Spotify without Facebook' (available at https://community.spotify.com/t5/Help-Accounts-and-Subscriptions/Spotify-without-Facebook/td-p/15843)

simultaneously designing its interface so that it would be *perceived* in a way most favorable to the production of abstract space. *Lived* practices may do much to shape the spaces of music streaming, but such spaces are at the same time heavily influenced by spatial *perceptions* and *conceptions*.

As this example of resistance to Spotify/Facebook integration shows, abstract space is riddled with contradictions and tensions. Media space, much like urban space, is the always conflicted nexus where abstract space and social space collide. On music streaming services, the tension between social and abstract space arises through decisions over what listener actions and behavior to measure, how to measure them, and how to establish commensurability amongst listeners who generally do not want to be measured. As Leckie and Given (2010, 231) write:

Abstract space can be quantified, measured, and manipulated (units of production, output measures, etc.) but at the same time, people seek to escape the relentless empiricism of abstract space by demanding certain qualitative characteristics of space (rest, relaxation, adventure, etc.).

This confrontation between abstract and social space is the "essential spatial contradiction of society" (Gottdiener 1994, 127). The stakes involved are perhaps nowhere best exemplified in the music streaming sector than in the recent, and ongoing, battle over the popular Berlin-based audio platform 'SoundCloud'. It is to a detailed examination of the transformation of SoundCloud that we turn to now.

**SoundCloud: An Introduction**

SoundCloud is an immensely popular audio streaming and music sharing platform that is often heralded as the 'Youtube of Music". Founded in Sweden in 2007 but established in Berlin, Germany, SoundCloud quickly built a reputation amongst underground DJs as an artist-friendly platform. Enthusiasts celebrated SoundCloud's ability to foster grassroots connections and collaborations. Allowing musicians to share tracks, receive feedback on them, and engage in a conversation about the music, SoundCloud soon replaced MySpace as the online home for musicians and music fans. A UK-based musician and producer who first joined SoundCloud in 2009, explained the initial appeal of SoundCloud in an interview:

> [I]t was a complete revelation…an amazing place to meet other musicians, interact with them, learn from them and help them with what little knowledge I had. …[W]hat was really amazing was the interaction, the way many of us bonded through our music, and groups of friends built up and developed.…[C]ollaboration was a fundamental part of SoundCloud…[Y]ou could get help and advice on a track (the bass is too loud, the guitar could be double tracked in this section, needs something else in this part, vocal has too much reverb etc). All you had to do was ask. As a result of this I saw not only my work but also that of my fellow musicians improve exponentially. (personal communication, March 1, 2015)

Instead of relying on advertising or subscription fees, SoundCloud initially built its service on a different business model, choosing to charge audio creators for access to premium features. While up to 2 hours worth of audio content could be uploaded on the service for free, the purchase of a "Pro" or a "Pro Unlimited" account unlocked further features, such as greater uploading volume and detailed statistics on who was listening to your tracks.

This 'freemium' model succeeded in attracting new users at an explosive rate.

SoundCloud grew from 1 million users in May 2010, to 5 million registered users a year later, and to 15 million users by May 2012. By 2014, well over 40 million had registered with the service. Yet, as usage numbers skyrocketed, so did monetary loses. The company has lost money every year that it has been in operation. SoundCloud's most recent financial filing shows that while revenue rose 40 percent from the previous year to $14.1 million, the company's operating loss increased 100 percent to $29.2 million (Lunden, 2014). This has not prevented SoundCloud from raising significant sums of investment capital. To date, SoundCloud has disclosed $123.3 million in funding from investment firms such as Institutional Venture Partners, Union Square Ventures, and the Chernin Group (ibid).[186]

As the company has transformed from a "social space" for underground music fans and creators, to a massively popular listening post with around 175 million unique listeners a month, pressure has steadily been building from investors to monetize these listeners.[187] In 2014, SoundCloud announced that it was introducing advertising, first to users in the US market with global implementation soon to follow. Advertisers who want to rent access to SoundCloud's American listening audience are currently being offered

[186] According to *The Wall Street Journal*, SoundCloud is valued at around 700 million dollars. However, recent discussions to raise about $150 million in new financing would raise its valuation to $1.2 billion (Rusli, Karp, & MacMillan, 2014).

[187] Several of the top investors who are funding SoundCloud also sit on the boards of other prominent social media and music streaming companies. For example, Peter Chernin, CEO of The Chernin Group, sits on the boards of Twitter and Pandora Internet Radio. A closer look at the corporate networks linking SoundCloud to much more established new media corporations has led some to speculate about SoundCloud's future monetization strategies. For example, one commentator speculates that SoundCloud is preparing to monetize the data generated by its vast listener base (see Nappy, 2014).

the choice of five different ad products – native, audio, display, channel sponsorship, and contests.[188] In order to generate revenue alongside advertising, SoundCloud has also announced that it will introduce a subscription service in the near future.

SoundCloud chief executive Alexander Ljung described the company's evolution and current phase of development in an interview with *the Guardian*:

> It's almost the third chapter for SoundCloud. We started off building great tools for creators to be able to make use of the web, then our second chapter was making it much more accessible for listeners, so those creators could build a much larger audience. This third chapter is about allowing people to start monetising that audience (in Dredge, 2014).

The decision to introduce advertising has been highly controversial, especially amongst SoundCloud's most devoted and long-time users. To a certain degree, this is not surprising. Interrupting the flow of media content with advertisements is never going to be a popular move amongst audiences that have become accustomed to an ad-free experience. In SoundCloud's particular case however, the introduction of advertising seems to have been viewed by many as final confirmation of SoundCloud's betrayal of its founding ethos. In Lefebvrian terms, this transformation could be described as a shift from a "social space" of music collaboration and community, to an "abstract space" serving major record labels and investors. To put it so bluntly however, is to miss much of what makes the production of abstract space contested, open-ended, and indeed, dependent on social space. A more careful account of this transformation requires

[188] On March 2, 2015, SoundCloud announced on its blog that in the first 6 months of the program 100 Premier Partners had been signed up and paid $1 million in advertising revenue.

Lefebvre's trialectical approach to better investigate the perceived, conceived and lived dimensions of the struggle to produce abstract space.

## From 'Classic' to 'Next SoundCloud': Perceived and Conceived Dimensions of a Becoming-Abstract Space

We begin by looking at the politics over re-designs of SoundCloud's interface, which over the past few years have angered many early adapters. This wave of discontent can be traced back to the introduction of "Next SoundCloud" in late 2012.[189] The new design was promoted as a sleeker, more user-friendly version with added features such as 'reposting' (similar to a retweet), "likes" and a 'related track' function for music discovery. One review editorial recognized that 'Next SoundCloud' represented a strategic move by the company as it "shifted on its axis" to focus "on engagement and growth of its listening population." Noting that the update "benefit listeners more than artists", the review argued that this redesign particularly "hurt the legacy artist community for which the platform was founded." SoundCloud, the review concluded, had "changed from a musician's club to a popular listening station." "The forceful emphasis on sit-back listening over lean-forward collaborating" as the article put it, "presents a jarring change for this once-geeky musician site..." (Hill, 2012).

In overhauling its much-loved interface, the 'material space' of the SoundCloud community - as *perceived* by SoundCloud's users - was being dismantled in order to

[189] See http://blog.SoundCloud.com/2012/12/04/next-becomes-SoundCloud/

appease what many of critics labeled ‘casual listeners’ or ‘passive consumers’. Indeed, after reading through thousands of online comments across several blogs, forums and websites, and interviewing several former and current SoundClouders, a strikingly clear picture has emerged about how artists – the community for which the platform was founded – feel about the ‘Next SoundCloud’ redesign and subsequent changes to SoundCloud’s interface.[190]

On the SoundCloud blog, hundreds of mostly critical responses greeted the company’s announcement of ‘Next SoundCloud’. In particular, the miniaturization of the comments feature drew repeated condemnation. The ability to place comments on a specific part of a music track has long been a central feature of the social experience of using the service. A UK-based musician and producer who had participated in SoundCloud from early on told me:

> I enjoyed collaborations with musician from all over the world…but the main things were the comments on the waveform, the way the feed gave you an update on what those you followed liked or commented on and the sense of community this generated with the overall interaction (personal communication, March 1, 2015).

The redesign and reduction of comments seemed, as another SoundClouder put it, “to diminish the emphasis on musicians providing supportive feedback to one another”

[190] See for example the hundreds of comments on SoundCloud’s blog in response to a major redesign. SoundCloud “The Next SoundCloud Becomes SoundCloud." *SoundCloud*. N.p., 4 Dec. 2012. Web. 25 Oct. 2014. <http://blog.SoundCloud.com/2012/12/04/next-becomes-SoundCloud/>. Also see http://forums.blipinteractive.co.uk/node/10021, and http://www.thefader.com/2014/11/12/whats-gonna-happen-to-SoundCloud.

(Eales, 2012). Another SoundClouder crystallized the opinion of many when s/he wrote:

> One of the things about a healthy and passionate community is the ability to foster conversations. The Classic player did that in spades. And it was by far the biggest hook in SC. Your (CLASSIC) player encouraged users to comment, and motivated many of us to reply to comments, enabling us to truly connect with people around our passion - MUSIC. That was surely THE HEART AND SOUL of SC…Surely you cannot possibly risk marginalizing that? But I fear, that is somehow exactly what you have done (Randall, 2012).

Yet another disappointed SoundCloud user wrote the following:

> Commenting is communication, interactivity. It's the single most important tool in creating a community on SoundCloud. People listen and comment in real time. To be able to connect and communicate directly with the musician behind the music is new and exciting…a usp for SoundCloud…at least it WAS, because Next SoundCloud makes that kind of real-time communication virtually impossible. (McKeown, 2012)

Along with the redesign of how comments appeared on 'Next SoundCloud', the new 'repost' function was also criticized by many loyal SoundClouders. The primary complaint was that it made it harder to distinguish between the songs a musician had uploaded and the songs s/he was simply sharing. In an interview with a SoundCloud user and creator who goes by the name of '3ndymion', the deficiencies of the repost feature were explained as follows:

> Whenever you visit an artist's profile, you can see and listen to all of the songs they made. However, now SoundCloud added this repost feature, and all reposts are placed on top of the artist's own songs, pushing the artist's songs down into seeming non-existence. (3ndymion, personal communication, March 1, 2015)

Similarly, another musician wrote on the SoundCloud blog:

> [T]he problem (with the repost function) is that the original artist is not credited in a way that is visually sufficiently clear. I have had one of my own tracks "reposted" by another user, and shortly after that I found comments were added praising that user's piano playing, not mine. (Eales, 2012)

A popular feature in the Classic SoundCloud player was 'Spotlight'. By clicking on an

artist's Spotlight tab, listeners were greeted with five of the artist's signature tracks, chosen by the artist. In 'Next SoundCloud', these tracks are simply pinned to the top of the artists profile stream. Many users, and in particular musicians who paid for the feature as part of the 'Pro' account, complained about the change. On djforums.com, one irate SoundClouder wrote:

> Artists want control over their page. Artists typically want people visiting their site for the first time to see their finest works - not the old demo they put up last night. Likewise, the visitors want to be exposed to said artists best work - not the old demo. The whole timeline concept stinks. It belongs in the world of social media, not in the world of presentation of music. Next SoundCloud needs to give the artists the opportunity to fully control what the visitors see on the first page. (BlueSwan, 2012)

SoundCloud's redesign provoked a hostile response that was clearly directed at material transformations to the service's interface as *perceived* by users. The reduced visibility of the comments feature, the introduction of the reposting function, the loss of control over how musicians could represent themselves through 'Spotlight - all of these changes were challenged by users who saw them as harmful to the maintenance and production of 'social space' on SoundCloud.

Likewise, in 2014, when SoundCloud introduced its new iOS app, criticism centered on the removal of key features that facilitated community. One disappointed commenter listed the features he felt SoundCloud had wrongly removed with this recent update, including:

> …the ability to see who is following you, who you are following (which makes no sense at all because you no longer have the ability to proactively go to someone's page to check out their music!!! You can only stream the latest music under the streaming section or perform a search), you no longer have the ability to comment on someone's music, to see what others have commented on your music or see comments that have been made about other's music. You also no longer

> have the ability to see notes the artist has made about their music including tracklists, or the ability to see who has "liked" your music. Pretty much all stats have been removed except the total number of times a track has been played. (Tim, 2014)

Another commenter wrote: “You removed all the features that make SoundCloud what it is in the first place and now seem to be more focused on pushing content rather than supporting or encouraging user created content” (Mezzurias, 2014). As an irate user who commented under the name ‘Ricky’ (2014) put it “They are aiming to please the listeners but screwing the people that give listeners something to listen to.” Confirming the company’s new allegiance to listeners, SoundCloud director of Product Design Brian Yeung explained "If you want to focus on the listening experience you've got to pare everything down and simplify" (Titlow, 2014).

As discussed earlier, Lefebvre helps us to understand space as a trialectical process produced at the nexus where material form, concept and practice intersect. Lefebvre (1991, 38-39) referred to these three dimensions of space as “spatial practice” [space as *perceived* through our senses], “representations of space” [space as *conceived*] and “representational spaces” [space as *lived*]. In Lefebvrian terms, the production of ‘abstract space’ on SoundCloud can be *perceived* in the initial redesign of the “Classic SoundCloud” interface and subsequent updates. Thus, the outburst of critical reaction represents a struggle over a particular space provoked primarily by material changes to the site’s interface. We can all think of cases when redesigns of physical spaces – such as a park, or a neighborhood – are contested out of concern that the changes are being made to appease capital. Changes to *perceived space*, we can say, reveal what Lefebvre referred to as the “*conceived space*” of those who produce the dominant “representations

of space".[191]

In conversations with SoundClouders, and in online comments, *perceived* changes to SoundCloud's interface were pointed to as evidence of a shift in how SoundCloud *conceived* of the service. As one avid SoundCloud user wrote in response to the introduction of 'Next SoundCloud':

> I feel the problem here is not so much the changing of individual functions (which is a great distraction from the real issue here) but instead it's what they represent, and what they represent is a change in overall direction. (Owen, 2012)

Speculation of what these changes represented was rife amongst SoundClouders. For example, speaking specifically of the introduction of the 'repost 'function, '3ndymion' told me:

> I can imagine that they wanted to do this to spread music around more, & get more plays & more stats for everyone, & for their site as well. However, why they decided to do it at the expense of pushing artists' own music tracks into irrelevancy is beyond my imagination. Artists, themselves, are listeners on SoundCloud as well, & reposting only pushes their own tracks out of the way... [T]hey were probably aiming to please some investors or something. They were probably acting on a long term goal of getting some kind of funding deal for themselves, putting corporate demands over the people who use their service. (personal communication, March 2, 2015)

It is clear that many SoundCloud users were aware, and very concerned, that the popular service was following better-known media platforms down the path towards listener monetization. Some particularly angry users accused SoundCloud of "doing a

[191] As Andrew Merrifield (1993, 524) writes, "…the problem under capitalism is, according to Lefebvre, that primacy is given to the conceived; all which renders insignificant the 'unconscious' level of lived experience. What is lived and perceived is subsumed under what is conceived."

Zuckerberg." A "mrbiggs" (2012) wrote: "I didn't join SoundCloud in 2008 to have a Facebook for music" Another SoundClouder remarked "The new UI is awful and feels like it was produced in order to mimic Facebook's usability without ANY of those functions being necessary to musicians…" (GLD MTN , 2012)

When 'Next SoundCloud' was introduced in late 2012, one critical user speculated in a comment on SoundCloud's blog that the repost feature had been implemented to make SoundCloud more attractive to advertisers:

> Mainstream sing-a-longs & major acts will get the reposts, meaning the variety actually seen will become on a par with a commercial radio stations playlists. This is not a tool that supports creators, its a tool that supports business. As I said, its your business so you are perfectly entitled to become a clone of facebook or myspace if you want (I imagine thats where the sponsorship and advertising revenue is), just don't steal our money or abuse our trust while doing it. (Bo Bo Nomad, 2012)

Two years later when SoundCloud began rolling out advertising in the US market, it became much more evident that the 'conceived space' of SoundCloud was a reflection of social media services. For example, the two native ad products currently being offered to advertisers both mirror similar ad products from Twitter. Akin to Twitter's 'Promoted Tweets' program, SoundCloud offers advertisers "Promoted Tracks". A company like Red Bull, for example, can upload a music track which is given more visibility than other tracks by being pushed to the top of music streams. The other native ad format offered by SoundCloud provides advertisers the ability to create their own brand profiles and pages where they can aggregate playlists and promote their products to 'followers'. The brand page for "Red Bull Sound Select", for example, has almost 60,000 followers at the time of writing. In addition to these two native ad formats, SoundCloud also connects brands

with artists through sponsorship opportunities and contests (see Johnson, 2014).

In introducing the launch of their new "On SoundCloud" program, SoundCloud offers select creators the opportunity to monetize their tracks through advertising. These invite-only "Premium Partners" as they are called, are selected for their "good standing within the SoundCloud community, their proven ability to build an engaged audience, and their growth over time" (SoundCloud, n.d.). This new exclusive tier chips away at one of the SoundCloud's most celebrated promises – that anyone can be discovered if they create enough grassroots buzz. With the "On SoundCloud" program, artists who are invited to join are not only given the opportunity to make money through placing ads against their content, but they are also provided with significant marketing advantages over their peers, including promoted tracks and profiles. Some SoundCloud users have pointed to a greater appearance of major label musicians on the "Who to Follow" recommendations or the "Trending Music" lists that SoundCloud provides.

When I asked one SoundCloud artist if he felt as if the service was increasingly promoting major label music and musicians, he replied:

> In my opinion, yes... I think they are more promoted in the "Trending Music" section... But it's only my opinion... Back in days, people like me were actually easily found in the trending music section, more than today... It was such a cool thing, this stuff was a real exposure to the world of listeners... It was the case for me several times... Now I think this time is gone…(Trolliet, personal communication, March 13, 2015).

Many placed the blame for SoundCloud's transformation squarely on the backs of the major record labels. One SoundClouder asked:

> …do these celebrities really need more exposure?...I come to SC to hear grassroots music and support the little guy. I guess the music industry needs to insure it stays in the spotlight for as long as possible during it's slide into

irrelevancy. (Lunesis, 2012)

SoundCloud has long had a complicated relationship with the recording industry. Record labels, as the *New York Times* pointed out "use the service to promote new releases and even hunt for new talent but have been irritated by their inability to make money from SoundCloud's millions of listeners" (Sisario, 2014). In the fall of 2014, Warner Music became the first of the "big three" major labels to sign a deal with SoundCloud.[192] The deal allows both Warner Music and its publishing division to collect royalties for the songs they have chosen to monetize on SoundCloud. Warner has also taken a stake in SoundCloud; reportedly between 3% to 5% (Karp, 2014). This lends credence to those who fear that this formerly grassroots social space is being re-*conceived* to fulfill the promotion and distribution aims of the music industry.

Before SoundCloud even signed a formal deal with one of the major labels however, it was granting these labels access to its space for copyright policing purposes. Over the past few years, there has been a growing chorus of complaints from SoundCloud musicians, in particular DJs, about their tracks being removed for copyright infringement. In one case, an email was published online by a SoundCloud user who had been told that his account would be closed due to copyright infringements on his radio show. SoundCloud claimed in its email response that it had no control over the removals.

[192] SoundCloud is, at the time of writing, reportedly in talks with both Universal and Sony Music. Two music publishers, Sony/ATV and BMG, are already partners in a program known as 'On SoundCloud' (see https://on.SoundCloud.com/) which has introduced advertising for select artists, starting initially in the US.

When the radio DJ inquired as to why his songs had been removed, SoundCloud replied:

> Your uploads were removed directly by Universal. This means that SoundCloud had no control over it, and they don't tell us which part of your upload was infringing…The control of removing content is completely with Universal. (Nappy, 2014).

The SoundCloud employee who wrote the above email was referring to Universal's "trusted sender" program, which permits the major label to identify and directly remove any upload that appears to contravene copyright law. It is not surprising that this has made many of SoundCloud's most devoted users very angry. SoundCloud became popular precisely because it gave DJs a place to collaborate, and in particular, creatively re-mix music. The "*lived* space" of SoundCloud, it could be said, was a musical playground; a 'social space' in the Lefebvrian sense of the term. In its early days, SoundCloud took a relatively relaxed approach toward copyright enforcement. However, under increasing pressure from the recording industry, in recent years SoundCloud has relented.[193] New York-based DJ and producer Jace Clayton describes this transformation as something of a betrayal of the community responsible for SoundCloud's success:

> They courted DJs in the beginning when they could afford to be more lax about copyright enforcement, using that to hype and reach a larger mainstream crowd...And then they say, 'OK, we're going to start pulling a lot of those early mixes that we pretty much tacitly condoned.' It's this awful bait-and-switch. (in Harvey, 2014)

[193] Insiders have pointed out that that Twitter was at one time very interested in purchasing SoundCloud but it backed out of the deal when it realized the difficulty of licensing all of SoundCloud's content (see Owsinski 2014).

In a similar vein, the producer LAKIM complained publicly about receiving a message on SoundCloud that two or his remixes had been removed. If a third was flagged, he was told, his account would be terminated. What concerns him most, LAKIM says in an interview, is that SoundCloud is "neglecting the community that put them in the position they're in and essentially built them into what they are now" (Martin, 2014).

This state of affairs reminds us that the production of 'abstract space' – the space of capitalism – is always about more than 'mere' economics. Abstract space is also disciplinary. "[S]pace is a political instrument," writes Dale Bradley (1999, 137). "It is a primary means by which policing and administrative control is enacted through the production of spaces amenable to these activities (for example: the class-based spatial divisions of urbanism, and the strictly regulated transit within cities and between nations)."

The rise of SoundCloud and other streaming services has helped the remaining big three record labels - Universal, Sony and Warner - tame the wild west of digital music. As Joe Steinhardt, owner of independent label Don Giovanni Records, recently wrote, "It seems like the main benefit of pushing music into the cloud and streaming delivery mechanisms is to quietly consolidate control into the hands of a smaller and smaller group of players" (Steinhardt, 2015). Steinhardt goes on to speculate:

> Maybe what scared the major music and technology companies so much about the digital music environment wasn't piracy, but that it threatened to actually democratize music, turning it into a space where big and small could compete with each other more fairly. The push to on-demand full-catalog streaming as the primary form of music consumption undoes that level playing field, shifting power back into the hands of a small group of major labels and tech companies. (ibid)

**Resistance through "Lived Space"**

In redesigning its interface to appeal to the general listener so that *perceived* space better represents *conceived* space, SoundCloud risks generating tension with the *lived* space of the SoundCloud community. Since its grassroots beginnings, the *lived* space of SoundCloud has been characterized by deep engagement with the service's interface through commenting and sharing functions. In order to monetize its growing listener base, SoundCloud needs to retain this deep engagement, but in a way that serves the purposes of data measurement and analytics.

Instead of encouraging engagement for the purposes of producing social space, engagement now merely becomes a proxy for attention and a cue to activate advertising. For example, to get around the fact that banner ads on mobile devices are usually clicked accidentally, SoundCloud only serves such ads when listeners are actively searching for a track, controlling a track, or doing something else on screen. In this way, 'lived' space is harnessed to generate rents.

Nevertheless, while SoundCloud can engineer strategic redesigns of their service, they cannot fully control listener behavior. In particular, SoundCloud users are well-known to be more tech-savvy than average netizens. A recent study by the British digital consumer research firm GlobalWebIndex concludes that about half of SoundCloud users have used a virtual private network (VPN) and that SoundClouders are 2.5 times more likely to use a VPN to access content online. What is even more problematic for SoundCloud's strategic plan to generate rents through advertising is the survey's finding that SoundClouders are twice as likely to use anti-tracking software than the average

internet user, and half of SoundCloud users surveyed have installed an ad blocker (McGrath 2015).

Without conducting a detailed netnography of SoundCloud, it is difficult to conclusively establish how SoundClouders have responded to the many changes the service has made over the past few years. However, based on online comments and conversations with SoundClouders, it is clear that one response has taken the form of exodus. After the introduction of 'Next SoundCloud', several commenters echoed the sentiment of this user's message to SoundCloud:

> If you don't change this emphasis of direction, it's only going to take one musician who can design a decent website (and there are a hell of a lot of people capable enough in this technologically based community) and SoundCloud will become the next 'Friends Reunited' practically overnight. (Owen 2012).

Another user agreed with the above comment adding, "I know that there's already talk about setting something up...and when that works out – the question not being if –you'll see another exodus coming" (Theo-G, 2012). A couple of years later, Forbes reported that SoundCloud has indeed experienced "ongoing user attrition". The business magazine claimed that attrition was particularly pronounced amongst SoundCloud's DJ community, "who are leaving for other services like MixCloud, MixCrate and Play.fm" (Owsinski 2014).

Some have chosen to voice their displeasure in other ways. In late 2012, there were calls online for musicians on SoundCloud to 'private' all their tracks in protest of the change to the 'Classic SoundCloud' interface. A petition was also started and several irate SoundClouders replaced their profile picture with a black and white 'Save SoundCloud Classic' image. A "Classic SoundCloud Appreciation Society" group also

formed on SoundCloud.

Finally, a particularly creative response was the production of an audio track called “Don't Facebook my SoundCloud” which, in true SoundCloud fashion, was subsequently remixed and reposted by several other SoundClouders.[194] The lyrics to this plaintive plead capture some of the central concerns over SoundCloud’s new direction:

> Don't tell me who I should hear
> Don't tell me who I should follow
>
> Don't cut away my friends
> I learn from what they like, what they say
>
> Don't break me down
> to a dead pan consumer
>
> This new SoundCloud is not
> the thing that got you here
>
> I can't read what my friends say
> Just got your slickered pictures
>
> Tried to tell you, over and over
> Don't hatchet my community

Indeed, the word “community” appears repeatedly in reactions to the late 2012 redesign of ‘Classic SoundCloud’. One SoundCloud user commented: “the next SoundCloud goes a long way towards dismantling everything that made the existing 'classic' version the best music sharing community on the internet” (Broker Jonathan, 2012). A UK-based musician/producer more recently described SoundCloud’s ongoing transformation as a

[194] The track can be found at https://SoundCloud.com/r-37/refrain-dont-facebook-my

betrayal of its community:

> SoundCloud created something genuinely special and unique, something which for many was life changing and for most was a real game changer. Then when they were large and all-encompassing enough, they turned it on its head and killed off what made it great – the community. (personal communication, March 1, 2015)

Resistance to SoundCloud's transformation has largely been over what kind of space it has, and will, become. In Lefebvrian terms, what has occurred on SoundCloud can be most accurately depicted then, as a struggle over space. Redesigns of the service have been seen as a direct threat to the "social space" early users had created. In short, 'Classic SoundCloud' was to social space what 'Next SoundCloud' is to abstract space. This is a clash between a space that can be effectively monetized and, as Lefebvre (1991, 359-60) put it - in reference to the struggle to maintain urban green space - a space "which produces only enjoyment - and is therefore 'unproductive'. It is a clash in other words, between capitalist 'utilisers' and community 'users'."

**Conclusion**

This chapter has attempted to demonstrate, with empirical reference to music streaming services, how Henri Lefebvre's trialectical model can help us understand how digital media spaces, like all spaces, are produced at the intersection of form, concept and practice. We *perceive* the material form of such spaces through their interfaces as we scan, swipe, and surf our way around these streaming sites. The music we play on streaming services envelopes us, surrounds us, and 'affects' us. The design of the sites we frequent online are *conceived* of by data analysts, programmers and engineers, who bring

to their work their own representations of space. Thus, digital media space is constantly under transformation. In short, a Lefebvrian 'trialectical' perspective on the production of space necessitates focus on the interplay between conceptions, everyday practices, and perceptions of the array of "material enablements and constraints" afforded by the medium (Hutchby 2001, 453). Lefebvre's approach is thus anything but deterministic (the claim long made against dialectical models). Its strength lays its analytical potential: leaving open possibilities and uncertainties. As Christian Schmid (2008, 34) argues, Lefebvre's trialectic method "permits the formulation of a strategy – without the certainty of achieving the aim."[195]

The struggle over space, and against 'abstract space' likewise manifests itself trialectically. At times, resistance challenges *perceived* changes to material space – for example the reduction of the size of comments visible on SoundCloud's interface or the introduction of the "reposting" function. Space as perceived through the senses is at the same time a clue to understanding the dominant conceptions of such space: *conceived space*. Changes to SoundCloud's interface are necessitated by the company's strategy to generate more revenue from advertising. SoundCloud is thus transformed from a musical playground of collaboration and user-generated content, to another promotion and

[195] As Schmid (2008, 33) explains: "Lefebvre's triadic dialectic posits three terms. Each of these can be understood as a thesis and each one refers to the other two and would remain a mere abstraction without the others. This triadic figure does not end in a synthesis as in the Hegelian system. It links three moments that are left distinct from each other, without reconciling them in a synthesis—three moments that exist in interaction, in conflict or in alliance with each other. Thus, the three terms or moments assume equal importance, and each takes up a similar position in relation to the others. In this way a new, three-dimensional or triadic version of the dialectic emerges."

distribution service for marketers and the major labels. This is not a sudden transformation but an ongoing process that can be tracked through updates to SoundCloud's Privacy Policy and Cookie Policy through the years, in buried statements about integration with Facebook, or announcements about the use of a new analytics service to better understand their users.[196]

Yet, the production of abstract space is always contested, open-ended, and indeed, dependent on the practices of listeners: on *lived space.* Abstract space is parasitic upon social space. Listener measurement – as an abstraction of listener activity - is central to the production of abstract space. Streaming services must emphasize and encourage music listening and engagement for there to be anything to measure in the first place. There must be a use value for streaming music if there is to be an exchange value for these spaces. Therefore, music streaming services remain social spaces, insofar as they retain a use value for listeners. They are at the same time, however, layered over by abstract space, which renders every action measurable and quantifiable. While this *could* be seen as a triumph of quantity over quality, it is never an outright triumph. The qualitative is never completely absorbed - or enclosed - by the quantitative.

[196] SoundCloud's most recent privacy policy – from Aug 2014 - is 5,000 words long, not including a separate Cookies Policy document of almost 3,000 words. These policies represent a very different company than does the first SoundCloud privacy policy I could find - a very brief and simple document from April 2010 with a single short paragraph devoted to cookies. This can be read as an indication of the growing importance of data mining and analytics for SoundCloud.

## Conclusion: Big Data and the Production of Music Streaming Space

> As I started playing with Pandora, iTunes Radio, Rdio, and Spotify Radio…I started becoming more intimately familiar with the listening labour required to construct algorithmic taste profiles. Providing positive or negative feedback for each new song was both irresistible and slightly maddening. Chiding and rewarding these systems felt like a mix between topiary gardening and a Rorschach test: a non-stop process of pruning my tastes, spurred by my instant reaction to new information. Such acts of pruning, I realized, are perhaps the defining social activity of life in the Stream. Voting "thumbs down" on a track for not immediately satisfying me is akin to liking a status update or a tweet, or even voting on the likeability of friends themselves by "hiding" certain folks in my Facebook feed, or periodically treating my list of Twitter followees like an overgrown bonsai tree. (Harvey, 2014)

This vivid account of what Pitchfork writer and communication professor Eric Harvey calls 'pruning' strikes at the heart of the experience of listening in an age of streaming. As described throughout this dissertation, music streaming listeners could be deemed the paragon of the "active audience" trope. In providing comments, building playlists, tagging music, sharing recommendations, and generating behavioral profiles, listeners engage in acts of 'prosumption' on streaming platforms. However, like the "prosumer commodity" on social media, it has also been argued that such acts of prosumption are "commodified by (music streaming) services and retained as surplus value" (Burkart 2013, 405).

A deceptively simple question grounded Dallas Smythe's attempt to develop a materialist analysis of the media: "[w]hat is the commodity form of mass-produced, advertiser-supported communications?" asked Smythe (1977, 2). So too began our investigation into the commodity form produced by ad-supported music streaming services. As we began to investigate updated accounts of Smythe's "audience commodity" thesis in more detail, it became clear that they contained many problems, not

least of which being a misunderstanding of Marx's value theory. Listeners on music streaming services - like social media 'prosumers' - we argued, do not directly produce surplus value. In turn, data about the listener, we concluded, was best understood to constitute what Marx would have called a 'fictitious commodity'.

Our search for the commodity form did not die here however. While the Marxist inflection of 'labour' may not be an accurate assessment, we argued that it would be a mistake to describe listening and listener actions on music streaming services as 'merely' a form of leisure, with the implication that it is of no concern to political economists. While listeners do not produce surplus value, they do contribute to the production of 'something', and this 'something' is the key to understanding the political economy of music streaming services.

With recourse to the work of Henri Lefebvre, this 'something', we argued, can best be described as "social space" – the spaces we create through our everyday interactions. Whether it be through deadheads congregating on a farmer's field, or hip-hop heads dancing around a boom box, social space has always been produced around music. Everyday listener practices have carried over to the internet, as has the production of social space around digital music. Indeed, digital music – the "crack cocaine" of the internet's growth - has been one of the most important facilitators for the production of online "social spaces" as netizens gather around and interact with each other through music production, sharing, and listening.

The question of how to commodify such digital music spaces has been the central question facing music streaming platform owners and the record labels that license their

music to them. Terrestrial radio faced much the same question nearly 100 years ago. In order to convince advertisers to put their money into this unproven medium, nascent commercial radio owners figured out how to represent such spaces through a ratings system. Like radio, and other ad-supported media, streaming platforms - attempt to generate rents from the spaces that are produced around media content. Through the type of data mining and analysis represented by The Echo Nest, these spaces can be measured, sorted, and segmented. In doing so, streaming services produce 'abstract space' (measurement always being an abstraction of that which it measures). In referring back to Marx's "two-fold nature of labour", what is made 'abstract' therefore, is not the 'concrete labour' of listeners, but rather the 'social spaces' of listeners.

Henri Lefebvre argued years ago that Marxists have been too focused on the production of commodities *in* capitalist space. In turn, they have been blind to the very production *of* capitalist space itself. This critique, I would argue, applies to media and communication studies as well. The debate over the 'commodity' produced by media – whether understood as 'content', 'audiences', 'watching-time', 'ratings', 'prosumers' or 'data' – has distracted us from recognizing that it is the production of 'abstract' media space that is key to unlocking the door to a materialist political economy of media.

The production of abstract space facilitates the extraction of rent – the central economic category of ad-supported media. In other words, the particular exchange that takes place on ad-supported commercial media can best be described as an exchange of rent for access: advertisers pay, not to 'buy', but to temporarily rent access to the spaces where audiences/users gather around media content.

These spaces are not left untouched by the granting of such access. Measurable, instrumental, and oriented towards exchange value, 'abstract space' stands in a contradictory and dependent relationship to social space. While social space can never entirely be dissolved, as our case study of SoundCloud demonstrates, abstract space increasingly shapes the possibilities and potentialities of social space. In order to produce abstract space, sociability is turned upon itself to fulfill the dictates of capital. The drive to increase advertising revenue leads to the further segmentation of listeners and content – as shown with the example of the Echo Nest's TPA, designed to identify and segment 'High Value Listeners'. This in turn has consequences for media social space, and for the subjects who produce such spaces.[197]

Measurement always changes that which it measures. Abstract space is not merely a measured, quantified representation of social space. It is a *re*presentation. What it measures, it also makes. For Lefebvre, the space of capitalism is an abstraction that becomes true in practice. This is what Marx referred to as a "concrete abstraction". Marx (1859) gives the example of how abstract labour, "measured by time, does not seem, indeed, to be the labour of different persons, but on the contrary the different working individuals seem to be mere organs of this labour." Abstract labour is thus an abstraction which becomes true in practice. Lefebvre draws from Marx when he describes capitalist

[197] "[T]he data profile begins to create the subject that they seek to measure" writes Arditi (2012, 201). "People begin to consume the goods that marketers think they would like to consume because data lock people into specific circuits of consumption as alternatives are eliminated."

space as a concrete abstraction. Just as workers under capitalism assume an indifferent attitude to their alienated labour, for Lefebvre, "the lived practices of those inhabiting (abstract) space are themselves abstract…." (ibid, 70). While Lefebvre gives the example of a driver's one-sided perception of space and the reductive use of space in functionalist urbanism, we need only consider how social media users adjust their behaviors to reap algorithmic rewards (ie. posting for 'likes') or the relationship between social media feedback and feelings of self worth.

On music streaming services, Paul Lamere of The Echo Nest discloses, "(e)very time a listener adjusts the volume…every time they skip a song, every time they search for an artist, or whenever they abandon a listening session, they are telling us a little bit about their music taste" (Lamere, 2014). As we increasingly migrate to streaming platforms with the knowledge that our every action is being monitored and assessed, how will this change, in whatever small way, our listening behaviors? This is still an open question. The 'datafication' of music listening is a remarkably recent development, with transformative implications for marketers and the music industry. Since the invention of the phonograph in 1877, the individual act of listening to recorded music – as opposed to the act of purchasing it – has largely been shrouded in mist, hidden from the prying eyes of marketers and the music industry.[198] Those days are long gone.

[198] Certain aggregate listening experiences have generated real-time data. For example, in the heyday of the jukebox, music tastes of precise locales could be determined thanks to the mechanized play meters built into the boxes (Harvey, 2014).

While critiques of datafication usually highlight threats to privacy (ie. Lane et. al., 2014), the justification for all this data tracking and analysis is usually made via appeals to 'personalization'. As discussed earlier, music streaming services are celebrated for their ability to fulfill the deeply personal music tastes of individual listeners. "Now playing. You", the tagline for a Pandora advertising campaign, capture's this promise of identity fulfillment. However, we should not so easily be hypnotized by the mantra of 'personalization'.[199] While digital music listeners today certainly have more choice and control over what to listen to, as already discussed, it is not the listener-as-individual, but rather the listener as consumer-category that ad-supported streaming services are interested in.[200] Danna and Gandy Jr. (2002, 373) recognized early on that while personalization as a "marketing strategy is based on the old idea of relating to customers as individuals", in actual practice it "rests on segmenting consumers into groups based on profiles developed through a firm's data mining activities."[201] This is a central point that has implications for both the dominant privacy-focused critique and for the personalization-oriented celebration of datafication.

This point applies across the internet on sites that rely on targeted advertising. In

[199] Radio DJs learned early on that vernacular and intimate modes of address paradoxically maximized the audience (see Lacey 2013, 170). Likewise, 'personalization' in new media can be thought of as a 'mode of address' as much as a technological solution.

[200] To celebrate the arrival of personalized media is to fall into the mass/individual trap long superseded by what Deleuze called "control societies." As Deleuze (1995, 180) put it "(i)ndividuals have become 'dividuals' and masses (have become) samples, data, markets, or '*banks*.'"

[201] "The identification will never move to the level of personhood as we may understand the person as the subject of religion, philosophy, and idealized systems of justice. The attention of the panoptic sort moves only to levels of identification that have administrative and instrumental relevance" (Gandy, 1993, 15).

the fraction of a second that it takes to load a new web site, an ad network will call up an ad from a server to deliver to you. However, this ad hasn't been chosen for you so much as for the *segment* you belong to. In other words, it is not you, as an individual, that these ads are speaking to, but rather you as a profile. Such profiling is assembled by complex algorithms that sort and organize potential consumers. While profiling itself is not new, the level of detail is. The degree of fragmentation is new. The categories are proliferating and becoming increasing defined. In the same way that the invention of the microscope made possible new classifications in science, new ways of measuring us online make possible new ways of classifying, and predicting, our behaviors. "Now playing. You" becomes "Now, playing you."

Once again, we can look to The Echo Nest to get a glimpse into the leading edge of music streaming datafication. The Echo Nest's system does not use tracking cookies. The company repeatedly emphasizes that they do not collect personally identifiable information ("PII") about listeners. They do not need to. Rather than finding out who you are and then recommending music to you based on this personal information, The Echo Nest flips the script, using what you listen to and how you listen to it – your musical 'habitus' - in order to figure out what kind of a listener – and consumer – you are. In place of cookies, music itself becomes the tracking device.

Negative media attention and heightened awareness about the widespread use of cookies and other tracking devices presents a problem for companies and industries that

rely on tracking their customers.[202] This presents an opportunity for companies – like the Echo Nest - that specialize in behavioral targeting. The Echo Nest can promote itself as a more virtuous company. In a recent white paper, The Echo Nest pitched its Music Audience Understanding solution to its music service clients by reminding them that they "can deliver effective monetization without compromising their users' online privacy" (The Echo Nest, 2013b, 5). A statement to this issue on their blog carries the title "Fully Anonymous and Privacy Friendly":

> We are obsessed with making online music better. Creepy ad technologies that track you around the web and approach the line of "personally identifiable information" do not necessarily improve online music. Our approach to segmentation is based on prediction and machine learning, so it doesn't need personally identifiable information, and we don't track users around the Internet; the solution works completely anonymously. (The Echo Nest, 2013b)

Not only is respect for the user promoted, but The Echo Nest points out that it is precisely their non-reliance on cookies which makes their tracking method more effective. As a tracking method, cookies have become increasingly ineffectual with the increasing use of mobile devices, and more generally proliferation and fragmentation across devices. "Because our solution doesn't rely on cookies" The Echo Nest (2014, 4) proudly points out "our segments can drive ad targeting across desktop, mobile, tablet, and other

[202] As awareness of online tracking has increased, so too has concern about data privacy. The most common response internet users take to maintain their online privacy is to delete cookies and browsing history. Pew Research recently found that 86% of Americans "have taken steps online to remove or mask their digital footprints—ranging from clearing cookies to encrypting their email" (Rainie et al., 2013).

connected devices." [203]

We can learn an important lesson from the fact that content and advertisement "personalization" on music streaming services does not require the collection of "personally identifiable information", and that such services actually benefit from the growing mistrust and inefficiency of cookies. To put it succinctly, personalization is not personal. As a result, the focus of our critical energy should shift away from concerns over privacy (as legitimate as they may be) to the algorithmic sorting and segmenting that drives online media industries. Or, in a more general sense we can frame the issue as Andrejevic (2002, 243) has:

> The increasingly important role of on-line surveillance in the digital economy should be construed not as the disappearance of privacy per se, but as a shift in control over personal information from individuals to *private* corporations.

The important contribution that Lefebvre's critique of abstract space provides is that it helps us move beyond debates over privacy, understood in the liberal individualist sense as 'the right to be left alone'. By juxtaposing measured, quantified, abstract space, not with 'private space', but with 'social space', Lefebvre attempts to reassert the primacy of social relations and notion of the collective subject.

As Wilson (2013) argues persuasively, we need to understand the significance of Lefebvre's concept of abstract space in relation to his lifelong project of understanding

[203] A Forbes article on the company argued that this could give The Echo Nest an advantage "as Web cookies come under fire from privacy advocates, as Google and others devise alternative tracking schemes, and as services are accessed increasingly on smartphones and tablets where cookies don't work" (Hof, 2013).

alienation within capitalist society. For Lefebvre, abstract space is alienated space. In the 19th century, Marx described the alienation experienced by factory workers confronted by the alien products of their abstract labour. Today, in the 21st century, as we interact with networked digital media, we contribute to the production of abstract space by feeding data into algorithms we have no control over. Mark Andrejevic (2014, 189) sounds a prescient warning when he writes:

> ..the real issue is whether or not we want to create a world in which every detail of our behaviour and communications with one another feeds into giant databases that are used to sort and evaluate us in ways that remain completely opaque to us, by a range of institutions whose imperatives are not necessarily our own.

Data-driven, algorithm-enabled music streaming services are but one example of how we are generating traces as we go about our everyday lives, engaged in everyday activities. Every thumb up, every thumb down, every song skip, ban or favorite feeds into the algorithms that end up building a profile of the listener and categorizing this profile, unbeknownst to the listener. This data may sit in Spotify or Pandora's database, or it may one day migrate out, as previously undetermined uses for correlating music taste with some other aspect of our lives are discovered. With data mining there is always the issue of "function creep" – the slow but steady widening of a system or a technology beyond its originally intended purpose. For example, data collected for the purpose of recommending music may be found to deliver a reliable predictor of financial solvency, IQ score, or relationship status. What if repeated listens to Adele's songs in the early morning hours is taken to mean that your marriage is on the rocks? This may seem like a far-fetched or silly example but discovering unanticipated patterns is what data mining is

designed to do. As Andrejevic (2014, 179-180) points out:

> Perhaps some combination…of my tastes in food, my birthplace and the climate in the city where I currently live, groups me with others who are proven susceptible to a particular type of illness. The database can determine this long before anyone figures out why. For many of those involved, the why will be irrelevant—what will be important is the probability of the prediction.

In short, than the datafication of listening has potential implications that extend far beyond music or advertisement personalization. At this point we can only guess who might be interested in knowing more about our music tastes, and for what purposes. This may not rank in the same class as concerns generated by the national security question: "how do we thwart a terrorist who has not yet been identified?", but the logic is the same. "[P]redictive analytics", writes van Dijck (2014, 200), "yields powerful information about who we are and what we do. When it comes to human behavior, though, this logic may also reveal a slippery slope between analysis and projection, between deduction and prediction."[204]

The point is that we have little control over the spaces we are creating through our everyday monitored activities. It is the abstract space we contribute to producing that confronts us as an alien force.

Still, we should not think that abstract space can be produced in one fell swoop,

[204] As a recent profile in Wired magazine puts it "The Echo Nest believes that figuring out what kind of listener you are - rather than just knowing what you listened to - is the key to engagement" (Vanderbilt, 2014). However, as the description of The Echo Nest's TPA reveals, they also promise to be able to figure out what kind of listener – 'high-value' or 'low-value' - you will *become*.

enclosing social space through the top-down imposition of metrics. Lefebvre's trialectics of space help us to think through the complexity of how 'abstract space' is produced and challenged. The *conceived* spaces of those who stand to profit from the datafication of listening are never uncontested in their dominance. They are always challenged by '*lived* space'. Punctuated by difference, digital spaces morph and refashion themselves to fit the particular needs, desires, and imaginations of embodied human beings who, in turn, create new conceptions of space. By recognizing the *perceived, conceived* and *lived* dimensions of the tensions between social and abstract space we can confront issues of interface design, contrasting conceptions, and lived practices of users. This allows us to develop a more nuanced understanding of how changes in any one of these dimensions, and their intersection, contribute to the production of online spaces - for people or for capital. At the same time, the critique of abstract space as alienated space focuses attention on the importance of building 'social spaces'[205] – for music and for all

[205] The internet is awash with 'social spaces' enabling creative, collaborative, and accessible ways to find, make and share music. A Google search query for "Alternatives to SoundCloud" yields almost 3,000 results. There are many interesting experiments in bringing music and music fans together online. For example, 'Earbits' is a commercial-free music streaming service and music marketing platform. Earbits has created its own virtual currency – called 'Groovies' - that listeners can earn by taking actions that benefit artists - such as sharing a band's music, or joining a band's official fan page. Once earned, Groovies can then be used by listeners to unlock on-demand features on the service. Earbits calls Groovies "the first social currency for streaming music" (see http://www.earbits.com/).

endeavors – spaces that foster the full realization of what it means to be human.

**References**


8tracks. (n.d.). Licensing | 8tracks radio. Retrieved July 18, 2014, from http://8tracks.com/licensing.

Adams, P. C. (1992) Television as gathering place. *Annals of the Association of American Geographers* 82.1: 117-135.

Adams, P. C., & Jansson, A. (2012). Communication geography: A bridge between disciplines. *Communication Theory*, 22(3), 299-318.

Adorno, T.W. (1945) A social critique of radio music. *The Kenyon Review* 7.2: 208-217.

Anders, P. (2001). Anthropic cyberspace: defining electronic space from first principles. *Leonardo*, 34(5), 409-416.

Andrejevic M (2002) The work of being watched: interactive media and the exploitation of self-disclosure. *Critical Studies in Mass Communication* 19(2): 230–248.

Andrejevic, M. (2002b) The kinder, gentler gaze of Big Brother Reality TV in the era of digital capitalism. *New Media & Society* 4.2, 251-270.

Andrejevic, M. (2004). The web cam subculture and the digital enclosure. In N. Couldry & A. McCarthy (Eds.), MediaSpace: Place, Scale and Culture in a Media Age (193–209).

Andrejevic, M. (2006). The discipline of watching: Detection, risk, and lateral surveillance. *Critical Studies in Media Communication*, *23*(5), 391-407.

Andrejevic, M. (2007). Surveillance in the digital enclosure. *The Communication Review*, 10(4), 295-317.

Andrejevic, M. (2009). Privacy, exploitation, and the digital enclosure. *Amsterdam Law Forum*, Vol 1, 4.

Andrejevic, M. (2014). Alienation's Returns. In Christian Fuchs and Marisol Sandoval (Ed.), *Critique, social media and the information society* (179-190) New York, United States: Routledge.

Andrejevic, M. (2013) Estranged free labor. *Digital Labor. The Internet as Playground and Factory*: 149-164.

Angwin, J. (2010, July 30). The Web's New Gold Mine: Your Secrets. Retrieved May 25, 2015, from http://online.wsj.com/news/articles/SB10001424052748703940904575395073512989404

Arditi, D. (2012). The State of Music: Cultural, Political and Economic Transformations in the Music Industry. George Mason University.

Arditi, David. ""Disciplining the Consumer."" Internet and Surveillance: The Challenges of Web 2.0 and Social Media 16 (2013): 170.

Arisaka, Y. (1995). Heidegger's theory of space: A critique of Dreyfus. *Inquiry*, 38(4), 455-467.

Arvidsson, A., & Colleoni, E. (2012). Value in Informational Capitalism and on the Internet. *The Information Society*, 28(3), 135-150.

Baran, P. A., & Sweezy, P. M. (1966). *Monopoly capital: An essay on the American economic and social order*. New York: Monthly Review Press.

Barreneche, C. (2012). *Localizing the Media, Locating Ourselves: A Critical Comparative Analysis of Socio-spatial Sorting in Locative Media Platforms (Google and Flickr 2009-2011*) (Doctoral dissertation, University of Westminster).

Baym, N. K. (2013). Data not seen: The uses and shortcomings of social media metrics. *First Monday*, 18(10).

Baym, N. K., & Ledbetter, A. (2009). Tunes that bind? Predicting friendship strength in a music-based social network. *Information, Communication & Society*, 12(3), 408-427.

Baym, N. K. (2010) Rethinking the music industry." *Popular Communication* 8.3: 177-180.

Baym, N. K., and Burnett R. (2009) Amateur experts International fan labour in Swedish independent music. *International Journal of Cultural Studies* 12.5: 433-449.

Beller, J. (2012). *The cinematic mode of production: Attention economy and the society of the spectacle*. UPNE.

Fine, B. (1979). On Marx's theory of agricultural rent. *Economy and Society*, *8*(3), 241-278.

Benedikt, M. (1991) “Cyberspace: Some Proposals.” *Cyberspace: First Steps*. Ed. Michael Benedikt. Cambridge: M.I.T. Press, 119 - 224.

Berland, J. (1992). Angels Dancing: Cultural Technologies and the Production of Space'. *Cultural Studies*, 38-51.

Bermejo, F. (2009). Audience manufacture in historical perspective: from broadcasting to Google. *New Media & Society*, 11(1-2), 133-154.

Bermejo, F. (2009). Audience manufacture in historical perspective: from broadcasting to Google. *New Media & Society*, 11(1-2), 133-154.

Berthon, P., Pitt, L., & Campbell, C. (2008). Managing Proprietary and Shared Platforms. *California Management Review*, 50(4).

Beville, H. M. (1988). *Audience ratings: Radio, television, and cable*. Psychology Press.

Billboard (2005, May 24). ""Billboard Radio Monitor to Carry Big Champagne Charts"" [Press Release]. Retrieved February 12, 2015, from PR Newswire: Factiva, Dow Jones

Bloustein, E. J. “Privacy as an aspect of human dignity: An answer to Dean Prosser.” *New York University Law Review* 39 (December 1964): 962-1,007.

BlueSwan (2012, Oct. 20) The Next SoundCloud [Web blog comment]. Retrieved from http://www.djforums.com/forums/showthread.php?7319-The-Next-SoundCloud&p=94861&viewfull=1#post94861

Bly, S. A., Harrison, S. R., & Irwin, S. (1993). Media spaces: bringing people together in a video, audio, and computing environment. *Communications of the ACM*, 36(1), 28-46.

Bo Bo Nomad (2012, Dec. 9) The Next SoundCloud Becomes SoundCloud [Web blog comment]. Retrieved from http://blog.SoundCloud.com/2012/12/04/next-becomes-SoundCloud/

Bolter, J. D. Grusin (1999). *Remediation: Understanding new media*.MIT Press.

Boyle, J. (2003). The second enclosure movement and the construction of the public domain. *Law and Contemporary Problems*, 33-74.

Bradley, D. A. (1999). *Unfolding a Strategic Space: A Discursive Analysis of Cyberspace's Power Relations*. National Library of Canada.

Broker, J. (2012, Dec. 4) The Next SoundCloud Becomes SoundCloud [Web blog comment]. Retrieved from http://blog.SoundCloud.com/2012/12/04/next-becomes-SoundCloud/

Brown, J. (2001). The Napster Parasites. Salon.com [Online Magazine] Retrieved January 12, 2010, from http://archive.salon.com/tech/feature/2001/02/09/napster_parasites/

Brown, Janelle. (2001). The Napster Parasites. *Salon.com* [Online Magazine] Retrieved January 12, 2015, from http://archive.salon.com/tech/feature/2001/02/09/napster_parasites/

Brownlee, J. (2014, February 5). The Next Big Thing In Music? Apps That Read Your Mind. Retrieved April 1, 2015, from http://www.fastcodesign.com/3025991/the-next-big-thing-in-music-apps-that-read-your-mind

Bull, M. (2005) No dead air! The iPod and the culture of mobile listening. *Leisure Studies,* 244, 343-355.

Burkart, P. (2014). Music in the Cloud and the Digital Sublime. *Popular Music and Society*, 37(4), 393-407.

Campbell, J. E., & Carlson, M. (2002). Panopticon. com: Online surveillance and the commodification of privacy. *Journal of Broadcasting & Electronic Media*, *46*(4), 586-606.

Caraway, B. (2011). Audience labor in the new media environment: A Marxian revisiting of the audience commodity. *Media, Culture & Society*, 33(5), 693-708.

Caraway, B. R. (2011b). *Resistance commons: file-sharing litigation and the social system of commoning*. (Unpublished doctoral dissertation). University of Texas, Austin.

Caraway, B. (2015). Crisis of Command: Theorizing Value in New Media. *Communication Theory*. 25.3: 1-18.

Carey, J. W. (1989). *Culture as communication: Essays on media and society.* Boston: Unwin Hyman.

Carlson, M. (2006) Tapping into TiVo Digital video recorders and the transition from schedules to surveillance in television. *New Media & Society* 8.1: 97-115.

Carpenter, E., & McLuhan, M. (1960). Acoustic space. in E. Carpenter & M. McLuhan (Eds.) *Explorations in Communication* Boston: Beacon.

Carroll, L, and Knight K. (2011) Incorporating Viral Media in Emerging Monetizing Music Models. Retrieved December 30, 2014, from http://www.viralmedia.pbworks.com

Casarino, C., & Negri, A. (2008). *In praise of the common: a conversation on philosophy and politics*. U of Minnesota Press.

Castells, M. (1996). *The Rise of the Network Society, The Information Age: Economy, Society And Culture,* Vol. I. Malden, MA: Blackwell Publishers.

Chen, C. (2003). Is the audience really commodity? An overdetermined perspective of the television economy. Paper presented at the Annual Meeting of the International Communication Association, Marriott Hotel, San Diego, CA, May.

Chen, Y., S. Boring, and A. Butz. 2010. How last.fm illustrates the musical world: user behavior and relevant user-generated content." *Proceedings of the international workshop on Visual Interfaces to the Social and Semantic Web* (Hong Kong, China).

Christodoulides, G. (2009). Branding in the post-internet era. *Marketing Theory,* 9(1), 141-144.

Cionci, J. (2011, September 21) Spotify introduces music to your social life. Retrieved December 30, 2014, from https://news.spotify.com/us/2011/09/21/spotify-and-facebook/

Clarke, D. B. (1995). Space, time, and media theory: an illustration from the television-advertising nexus. *Environment and Planning D*, 13, 557-557.

Cohen N. S. (2008) The valorization of surveillance: towards a political economy of Facebook. *Democratic Communiqué* 22(1): 5–22.

Cohen, J. E. 2007 "Cyberspace as/and Space." *Columbia Law Review*: 210-256.

Comor, E. (2015) Revisiting Marx's Value Theory: A Critical Response to Analyses of Digital Prosumption, *The Information Society: An International Journal*, 31:1, 13-19.

Conrad, T. (2013, June 5). Introducing tv.pandora.com. Retrieved May 22, 2015, from http://blog.pandora.com/2013/06/05/introducing-tv-pandora-com/"

Coté, M., and J. Pybus. (2007) Learning to immaterial labour 2.0: MySpace and social networks. *Ephemera: Theory & Politics in Organization* 7.1: 88-106.

Couldry, N. (2000). *The place of media power: Pilgrims and witnesses of the media age.* Psychology Press. Chicago

Couldry, N., & McCarthy, A. (2004). *Mediaspace: Place, scale and culture in a media age*. Routledge.

Crang, M., Crang, P., & May, J. (1999). *Virtual geographies: bodies, space and relations*. Psychology Press.

Crowds, C. (2011) The Engaged Consumer: Creating, Disseminating, and Negotiating Value in the Realm of Social Media. *Building Connections* 39: 168.

Dahud, H. (2012, February 23) Targeted Audio Ads Based On… Human Emotion? Retrieved December 29, 2014, from http://www.hypebot.com/hypebot/2012/02/targeted-audio-ads-based-on-human-emotion.html

Danna, A., & Gandy Jr, O. H. (2002). All that glitters is not gold: Digging beneath the surface of data mining. *Journal of Business Ethics*, 40(4), 373-386.

Darer, M. (2012, September 21). The Echo Nest: Redefining The Internet Music Experience. Retrieved May 19, 2015, from http://dyn.com/blog/dyn-dns-client-the-echo-nest-internet-music-streaming-spotify-pandora-online/

Davenport, T. H., & Beck, J. C. (2013). The attention economy: Understanding the new currency of business. *Harvard Business Press*.

David, M. (2010). *Peer to peer and the music industry: The criminalization of sharing*. Sage Publications.

de Freitas, A. C. (2010) Changing spaces: Locating public space at the intersection of the physical and digital. *Geography Compass* 4.6: 630-643.

Dean, J. (2014). Enclosing the Subject. *Political Theory*.

Deleuze, G. 1995. Postscript on control societies. *Negotiations 1972-1990*, 177-182.

Denis, W. (1982). Capital and Agriculture: A Review of Marxian Problematics. *Studies in Political Economy*, 7.

Desai, R. (2011). The New Communists of the Commons: Twenty-First-Century Proudhonists. *International Critical Thought*, 1(2), 204-223.

de Souza e Silva, A. (2006) "From Cyber to Hybrid Mobile Technologies as Interfaces of Hybrid Spaces" *Space and Culture* 9.3, 261-278.

Diallo, A. (2013, October 6). Pandora Radio's Dominance Built On Big Data Edge. Retrieved May 22, 2015, from http://www.forbes.com/sites/amadoudiallo/2013/10/06/pandora-radios-dominance-built-on-big-data-edge/

Digital Citizens Alliance (2014) Good Money, Gone Bad: Digital Thieves and the Hijacking of the Online Ad Business. A Report on the Profitability of Ad-Supported Content Theft. from https://media.gractions.com/314A5A5A9ABBBBC5E3BD824CF47C46EF4B9D3A76/4af7db7f-03e7-49cb-aeb8-ad0671a4e1c7.pdf.

Dodge, M., & Kitchin, R. (2001). *Mapping cyberspace* (pp. 65-80). London: Routledge.

Douglas, S. J. (1989). *Inventing American Broadcasting, 1899-1922*. Johns Hopkins University Press.

Douglas, S. J. (2004). *Listening in: Radio and the American imagination*. U of Minnesota Press.

Dredge, S. (2012, January 29) Spotify says Facebook partnership and new apps should allay growth fears. Retrieved December 30, 2014, from http://www.theguardian.com/media/2012/jan/29/spotify-facebook-partnership-apps

Dredge, S. (2012, July 12). The Echo Nest raises $17.3m and reveals Taste Profile Similarity Tech. Retrieved May 19, 2015, from http://musically.com/2012/07/12/the-echo-nest-raises-17-3m-reveals-taste-profile-similarity-tech/

Dredge, S. (2014, August 21). SoundCloud introduces ads so it can pay musicians and other creators. Retrieved July 12, 2015, from http://www.theguardian.com/technology/2014/aug/21/soundcloud-ads-musicians-major-labels

Dreher C. and Z. Bouck, (October 1941) "Our Radio Amateurs," *Harper's Magazine*,

Drew, R. (2005). Mixed blessings: The commercial mix and the future of music aggregation. *Popular music and society*, *28*(4), 533-551.

Drucker, J. (2011) Humanities Approaches to Interface Theory. *Culture Machine,* 120, 1-20.

Dunn, P. G., de Ruyter, B., & Bouwhuis, D. G. (2011). Toward a better understanding of the relation between music preference, listening behavior, and personality. *Psychology of Music*

Dwoskin, E. (2014, February 13). Pandora Thinks It Knows if You Are a Republican. Retrieved May 22, 2015, from http://online.wsj.com/news/articles/SB10001424052702304315004579381393567130078

Dyson, F. (2009) *Sounding New Media: Immersion and Embodiment in Arts and Culture*. Berkeley: University of California Press.

Eales, A. (2012, Dec. 4). The Next SoundCloud Becomes SoundCloud [Web blog comment]. Retrieved from http://blog.SoundCloud.com/2012/12/04/next-becomes-SoundCloud/

Ek, D. (2011, Sept. 26) “We'll try lots of things, and probably screw up from time to time, but we value feedback and will make changes based on it.” Tweet, Retrieved from https://twitter.com/eldsjal/status/118354784762855424

Elden, S. (2004). Between Marx and Heidegger: Politics, Philosophy and Lefebvre's The Production of Space. *Antipode*, 36(1), 86-105

Ernesto. (2011, June 17). Spotify: A Massive P2P Network, Blessed by Record Labels - TorrentFreak. Retrieved July 31, 2015.

Ettema, JS and Whitney DC (1994) *Audiencemaking: How The Media Create The Audience.* London: Sage.

Evans, A. W. (1991) On Monopoly Rent. *Land Economics*: 1-14.

Ferguson, M., & Golding, P. (1997). Cultural studies and changing times: An introduction. *Cultural studies in question*, 1-24.

Foucault, M. (1977). *Discipline and punish: The birth of the prison*. Vintage.

Frith, J. (2012) Splintered Space: Hybrid Spaces and Differential Mobility. *Mobilities*, 71, 131-149.

Frith, S. (1996) Music and identity. *Questions of Cultural Identity*, 108-27.

Fuchs, C. (2008) Don Tapscott & Anthony D. Williams: Wikinomics: How Mass Collabouration Changes Everything. *International Journal of Communication* 2: 11.

Fuchs, C. (2010) Labour in Informational Capitalism and on the Internet. *The Information Society* 26.3: 179-196.

Fuchs, C. (2012) Dallas Smythe Today-The Audience Commodity, the Digital Labour Debate, Marxist Political Economy and Critical Theory. Prolegomena to a Digital Labour Theory of Value. *tripleC: Communication, Capitalism & Critique*. 10.2: 692-740.

Fuchs, C. (2013) "Class and Exploitation on the Internet." *Digital Labour: The Internet as Playground and Factory*. London: Routledge: 211-224.

Fuchs, C. (2014) *Digital Labour and Karl Marx.* Routledge,

Gandy, O. (1993). The panoptic sort: Towards a political economy of information. Boulder: Westview.

Gandy, O. (1996). Coming to Terms with the Panoptic Sort *Computers, Surveillance, and Privacy*, 132.

Gandy, O. (2011). The political economy of personal information. The handbook of political economy of communications, 436-457.

Gardiner, M. (2000) *Critiques of Everyday Life*. Psychology Press.

Garnham, N. (1995). Political Economy and Cultural Studies: Reconciliation or Divorce? *Critical Studies in Mass Communication*, *12*, 62-62.

Garnham, N. (1998). Information society theory as ideology: A critique. *Loisir et Société/Society and Leisure*, *21*(1), 97-120

Garofalo, R. (1999). From music publishing to MP3: Music and industry in the Twentieth Century. *American Music*, 318-354.

Gitelman, L. (Ed.). (2013). *Raw data is an oxymoron*. MIT Press.

Glaser, W. T., et al. (2006, Feb 21) Consumer item matching method and system. U.S. Patent No. 7,003,515. available at http://www.google.com/patents/US7003515?dq=7,003,515

GLD MTN (2012, Dec. 6) The Next SoundCloud Becomes SoundCloud [Web blog comment]. Retrieved from http://blog.SoundCloud.com/2012/12/04/next-becomes-SoundCloud/

Gottdiener, M. (1986) "Recapturing the Center: a Semiotic Analysis of Shopping Malls" in M. Gottdiener and AP Lagopoulos Eds., *The City and the Sign. An Introduction to Urban Semiotics.* Columbia University Press.

Gottdiener, M. (1994). *The Social Production of Urban Space*. U of Texas Press.

Graham, S. (1998). The End of Geography or the Explosion of Place? Conceptualizing Space, Place and Information Technology. *Progress in Human Geography*, 22(2), 165-185.

Greeley, B. (2011, July 13). Daniel Ek's Spotify: Music's Last Best Hope. Retrieved August 1, 2015.

Griffen-Foley, B. (2004). From Tit-Bits to Big Brother: A century of audience participation in the media. *Media, Culture & Society*, 26(4), 533-548.

Grossberg, L. (1995). Cultural studies vs. political economy: Is anybody else bored with this debate? *Critical Studies in Mass Communication*, 12 :1. 72-81.

Grossberg, L. (1998). The cultural studies' crossroads blues. *European Journal of Cultural Studies*, *1*(1), 65-82.

Grossberg, L. (1992) *We Gotta Get Out Of This Place. Popular Conservatism and Postmodern Culture*. London: Routledge.

Hacker News (2011) Spotify now requires a Facebook account to sign up. Retrieved December 29, 2014, from https://news.ycombinator.com/item?id=3038815

Hampp, A., Christman, E., & Peoples, G. (2014, August 21). SoundCloud Debuts Monetization Play With 'On SoundCloud', Announces $100 Million In Funding.

Retrieved March 17, 2015, from http://www.billboard.com/articles/business/6228878/soundcloud-monetization-advertising

Hansen, C. H., & Hansen, R. D. (1991). Constructing personality and social reality through music: Individual differences among fans of punk and heavy metal music. *Journal Of Broadcasting & Electronic Media*, 35(3), 335-350.

Hardt, M. & Negri, A. (2009). *Commonwealth*. Cambridge Mass.: Harvard UP.

Harrison. S. (2009). *Media Space: 20+ Years of Mediated Life*. Springer, New York, NY

Hardt, M. 2010. "The Common in Communism", in Costas Douzinas and Slavoj Zizek (Eds.) *The Idea of Communism*, 131- 144. London: Verso.

Harvey, D. (1989). *The Condition of Postmodernity*. Oxford: Blackwell.

Harvey, D. (2009). The art of rent: globalisation, monopoly and the commodification of culture. *Socialist Register*, 38(38).

Harvey, E. (2014, April 16). Cover Story: Station to Station: The Past, Present, and Future of Streaming Music. Retrieved March 14, 2015, from http://pitchfork.com/features/cover-story/reader/streaming/

Hearn, A. (2006). John, a 20-year-old Boston native with a great sense of humour: on the spectacularization of the self and the incorporation of identity in the age of reality television. *International Journal of Media & Cultural Politics*, *2*(2), 131-147.

Hearn, A. (2011). Confessions of a Radical Eclectic Reality Television, Self-Branding, Social Media, and Autonomist Marxism. *Journal of Communication Inquiry*, *35*(4), 313-321.

Hefflinger, M. (2009, Aug 18) "Universal Music Taps BigChampagne for Online Metrics" Digital Media Wire Retrieved March 12, 2015 from www.dmwmedia.com/news/2009/08/18/universal-music-taps-bigchampagne-online-metrics.

Heine, C. (2012, October 5). Why Pandora Ads Target Hispanics and Spotify's Don't. Retrieved May 22, 2015, from http://www.adweek.com/news/technology/why-pandora-ads-target-hispanics-and-spotifys-dont-144284

Hill, B. (2012, December 7). Editorial: The new SoundCloud is optimized for listeners, not uploaders. Retrieved March 12, 2015, from http://www.engadget.com/2012/12/07/editorial-SoundCloud-optimized-for-listeners-not-artists/

Hof, R. (2013, November 21). Like These Songs? Then Maybe You'll Like This Ad. Retrieved May 19, 2015, from http://www.forbes.com/sites/roberthof/2013/11/21/like-these-songs-then-maybe-youll-like-this-ad/

Holloway, J. (2010). Cracks and the crisis of abstract labour. *Antipode*, 42(4), 909-923.

Howe, J. (2003). "BigChampagne Is Watching You." *Wired*. Retrieved March 15, 2015 from http://www.wired.com/wired/archive/11.10/fileshare.html.

Hughes, J. and Lang KR. 2003 'If I Had A Song: The Culture of Digital Community Networks and Its Impact On The Music Industry', *The International Journal on Media Management* 53: 180–189.

Hutchby, I. (2001). Technologies, texts and affordances. *Sociology*, *35*(2), 441-456.

Huws, U. (2014) The Underpinnings of Class in the Digital Age: Living, Labour and Value. *Socialist Register*, no. 50, 80-107

IFPI, Digital Music Report 2014 Retrieved December 29, 2014, from http://www.ifpi.org/downloads/Digital-Music-Report-2014.pdf

Ingham, T. (2015). Major labels keep 73% of Spotify premium payouts - report - Music Business Worldwide. Retrieved April 1, 2015, from http://www.musicbusinessworldwide.com/artists-get-7-of-streaming-cash-labels-take-46/

Ingham, T. (2015b). Turns out Spotify acquired The Echo Nest for just €50m - Music Business Worldwide. Retrieved August 1, 2015, from http://www.musicbusinessworldwide.com/spotify-acquired-echo-nest-just-e50m/

Innis, H. A. (1950). *Empire and Communications*. Oxford University Press.

Innis, H. A. (1964). *The Bias of Communication*. 1951. Intro. Marshall McLuhan.

International Federation of the Phonographic Industry, Digital Music Report 2014, Available at: http://www.ifpi.org/downloads/Digital-Music-Report-2014.pdf

Jablonski, C. (2011) November 28 Mixberry Media to fill dead space in streaming radio with ads | ZDNet. Retrieved December 29, 2014, from http://www.zdnet.com/article/mixberry-media-to-fill-dead-space-in-streaming-radio-with-ads/

Jansson, A. (2005). Re-encoding the Spectacle: Urban Fatefulness and Mediated Stigmatisation in the'City of Tomorrow'. *Urban studies*, 42(10), 1671-1691.

Jansson, A. (2007). Texture: A key concept for communication geography. *European Journal of Cultural Studies*, 10(2), 185–202. doi: 10.1177/1367549407075904.

Jansson, A., & Falkheimer, J. (2006). Towards a geography of communication. In J. Falkheimer, & A. Jansson (Eds.),*Geographies of communication: The spatial turn in media studies*. Nordicom: Goteborg.

Jansson, A., & Lagerkvist, A. (2009). The future gaze: City panoramas as politico-emotive geographies. *Journal of Visual Culture*, 8(1), 25-53

Jenkins, H. (2002). Interactive audiences? The collective intelligence of media fans. *The new media book*, 157-170.

Jessop, B. (2007). Knowledge as a fictitious commodity. *Reading Karl Polanyi for the twenty-first century: Market economy as a political project*. New York: Macmillan.

Jhally, Sut and Bill Livant. (1986). Watching as Working. The Valorization of Audience Consciousness. In The Spectacle of Accumulation. *Essays in Culture, Media, & Politics*, Sut Jhally, 24-43. New York: Peter Lang.

Jhally, S. (1987). *The Codes of Advertising*. New York: St. Martin's.

Jin, D. Y., & Feenberg, A. (2015). Commodity and Community in Social Networking: Marx and the Monetization of User-Generated Content. *The Information Society*, *31*(1), 52-60.

Joe, R. (2014, January 7). CES 2014: Why Pandora Is Happy That Cookies Are Disappearing - AdExchanger. Retrieved May 22, 2015, from http://www.adexchanger.com/digital-marketing-2/ces-2014-why-pandora-is-happy-that-cookies-are-disappearing/

Johnson, L. (2014, August 21). Red Bull and Jaguar Test New Music-Streaming Ads. Retrieved March 17, 2015, from http://www.adweek.com/news/technology/red-bull-and-jaguar-test-new-music-streaming-ads-159646

Jones, R. (2012, September 5) Spotify drops Facebook log-in requirement in the US. *Music Week*

Jones, S. (2002). Music that moves: popular music, distribution and network technologies. *Cultural Studies*, 16(2), 213-232.

Jurgensen, J. (2014, March 21). The Search for the Perfect Playlist. Retrieved July 24, 2015 from: http://www.wsj.com/articles/SB10001424052702304256404579449163704994966

Kaempffert, W. (1924) The Social Destiny of Radio, *Forum*, June, pp. 771-72:

Kang, Hyunjin, and Matthew P. McAllister. (2011) Selling You and Your Clicks: Examining the Audience Commodification of Google. *tripleC: Communication, Capitalism & Critique. Open Access Journal for a Global Sustainable Information Society* 9.2: 141-153.

Kant, I. (1965). *Critique of Pure Reason*. Unabridged ed. Trans. Norman Kemp Smith. New York: St. Martin's P.

Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business horizons*, 53(1), 59-68.

Karp, H. (2014, November 4). Warner Music Group Signs Deal to License Music to SoundCloud. Retrieved March 3, 2015, from http://www.wsj.com/articles/warner-music-group-nears-deal-to-license-music-to-SoundCloud-1415127425

Kitchin, R., & Dodge, M. (2011). *Code/Space: Software and Everyday Life*. MIT Press.

Kluitenberg, E., Altena, A., Andersen, K., Sikiardi, E., Van Der Velden, D., Vogelaar, F., ... & Sassen, S. (2007). *Open 11: hybrid space*. Rotterdam: NAI Publishers.

Krause, A. E., North, A. C., & Hewitt, L. Y. (2015). Music-listening in everyday life: Devices and choice. *Psychology of music*, 43(2), 155-170.

Ktrsch, S. (1995). The incredible shrinking world? Technology and the production of space. *Environment and Planning D: Society and Space*, 13, 529-555.

Kunz, B. (2013) . Advertising and the Media. *Controversies in Contemporary Advertising*.

Lacey, K. (2013). *Listening publics: the politics and experience of listening in the media age*. John Wiley & Sons.

Lamere, P. (2014, January 14). The Zero Button Music Player, *Music Machinery*. Retrieved April 1, 2015, from http://musicmachinery.com/tag/zero-ui/

Lamere, P. (2008) Social Tagging and Music Information Retrieval. *Journal of New Music Research*, 372, 101-114.

Lamont, T. (2013, February 24). Napster: The day the music was set free. Retrieved July 8, 2015, from http://www.theguardian.com/music/2013/feb/24/napster-music-free-file-sharing

Lane, J., Stodden, V., Bender, S., & Nissenbaum, H. (Eds.). (2014). *Privacy, big data, and the public good: Frameworks for engagement*. Cambridge University Press.

Lane, M. (2010) Interactive Services and the Future of Internet Radio Broadcasts. *Alabama Law Review* 62 : 465.

Lasar, M. (2011, January 12). Digging into Pandora's Music Genome with musicologist Nolan Gasser. Retrieved May 21, 2015, from http://arstechnica.com/tech-policy/2011/01/digging-into-pandoras-music-genome-with-musicologist-nolan-gasser/

Lawrence, A. 2004 "Market Research in the Internet Age: How Record Companies Will Profit from Illegal File-Sharing." *Journal of the Music & Entertainment Industry Educators Association* 4(1).

Lazify. (n.d.). Lazify. Retrieved May 25, 2015, from http://lazify.nl/

Lazzarato, M. (1996). Immaterial labour. *Radical thought in Italy: A potential politics*, 133-147

Leckie, G. J., & Given, L. M. 2010 Henri Lefebvre and Spatial Dialectics. *Critical Theory for Library and Information Science*, 221.

Lee, M. (2011). Google ads and the blindspot debate. *Media, Culture & Society*,*33*(3), 433-447.

Lefebvre, H. (1979). Space: social product and use value. *Critical sociology: European perspectives, 285*, 295.

Lefebvre, H. (1991). *The Production Of Space* (Vol. 142). Blackwell: Oxford.

Lefebvre, H. (1973/1976) *The Survival of Capitalism London*, England: Allison & Busby.

Lefebvre, H. (1995). *Writings on cities* (Vol. 63, No. 2). Oxford: Blackwell.

Lessig, L. (2004). *Free culture: How big media uses technology and the law to lock down culture and control creativity*. Penguin.

Lévy, P (2001). Collective intelligence. *Reading digital culture 4* : 253.

Levy, S. (2011, October 21) Steven Levy on Facebook, Spotify and the Future of Music, *Wired*. Retrieved December 30, 2014, from http://www.wired.com/2011/10/ff_music/all/

Liu, J. Y., & Yang, Y. H. (2012, November). Inferring personal traits from music listening history. In *Proceedings of the second international ACM workshop on Music information retrieval with user-centered and multimodal strategi*es (pp. 31-36). ACM.

Livant B, (1985), *Urban time and the valorization of consciousness*, unpublished manuscript, University of Regina

Livingstone, S. (2003). *The changing nature of audiences. A companion to media studies*, 6, 337.

Lunden, I. (2014, October 11). SoundCloud Posted A $29M Loss In 2013 On Revenues Of $14M. Retrieved March 3, 2015, from http://techcrunch.com/2014/10/11/SoundCloud-posted-a-29m-loss-in-2013-on-revenues-of-14m/

Lunesis. (2012, Dec. 5) The Next SoundCloud Becomes SoundCloud [Web blog comment]. Retrieved from http://blog.SoundCloud.com/2012/12/04/next-becomes-SoundCloud/

Lyon, D. (2001). *Surveillance society: Monitoring everyday life*. McGraw-Hill Education (UK)

Mandel, E. (2003, December 30). *Marx's Theory of Rent*. Retrieved November 22, 2014, from http://www.internationalviewpoint.org/spip.php?article285

Manovich, L. (2006). The poetics of augmented space. *Visual Communication*, 5(2), 219-240.

Manzerolle, V. (2010). Mobilizing the audience commodity: Digital labour in a wireless world. *Ephemera: theory & politics in organization*, 10(4), 455.

Marazzi, C. (2011). *The Violence of Financial Capitalism*. MIT Press Books, 1.

Martin, A. (2014, July 16). Has SoundCloud Turned Its Back on Its Users in Favor of Major Labels? Retrieved March 14, 2015, from http://noisey.vice.com/blog/has-SoundCloud-turned-its-back-on-its-users-in-favor-of-major-labels

Marx, K. (1859). Economic Manuscripts: Critique of Political Economy. The Commodity. Retrieved July 12, 2015, from http://www.marxists.org/archive/marx/works/1859/critique-pol-economy/ch01.htm

Marx, K. (1973). Grundrisse: Introduction to the critique of political economy. Penguin, London.

Marx, K. (1976). Capital Volume I. 1867. Trans. Ben Fowkes. New York and London: Penguin Books.

Marx, K. (1981). Capital, Volume III, translated by David Fernbach. New York and London: Penguin Books.

Marx, K. (1991). *Theories of surplus value, part III*. New York: Prometheus Books

Mattelart, A. (1996). *The invention of communication.* Minneapolis: University of Minnesota Press

Mattelart, A. (2000). Networking the world, 1794-2000. U of Minnesota Press.

Maxwell, R. (2001). "Why Culture Works," in Maxwell, R. (ed.) *Culture Works: The Political Economy of Culture*. MN: University of Minnesota Press.

Maxwell, R. (1991). The image is gold: Value, the audience commodity, and fetishism. *Journal of Film and Video*, 29-45.

McCarty, B. (2011, April 16). Last.fm: 50 billion scrobbles, the return of the mix tape - *TNW Media*. Retrieved July 21, 2015 from http://thenextweb.com/media/2011/04/16/last-fm-50-billion-scrobbles-and-the-return-of-the-mix-tape/

McCarthy A. (2001). *Ambient television: Visual culture and public space*. Duke University Press.

McChesney, R. W., & Schwoch, J. (1994). Telecommunications, Mass Media, and Democracy: The Battle for the Control of US Broadcasting, 1928-1935. *Technology and Culture*, 35(4), 873-874.

McCourt, T., & Burkart, P. (2007). Customer relationship management: Automating fandom in music communities. *Fandom: Identities and communities in a mediated world*, 261-270.

McGrath, F. (2015, February 16). SoundCloud as Popular Globally as Spotify. Retrieved March 17, 2015, from http://www.globalwebindex.net/blog/SoundCloud-as-popular-globally-as-spotify

McKeown, D. (2012, Dec. 8). The Next SoundCloud Becomes SoundCloud [Web blog comment]. Retrieved from http://blog.SoundCloud.com/2012/12/04/next-becomes-SoundCloud/

McMeans, O. E. (1923). The Great Audience Invisible. *Scribner's Magazine*, 73(4), 410-16.

McQuire, S. (2006). The politics of public space in the media city. *First Monday*.

McQuire, S. (2008). *The media city: Media, architecture and urban space*. Sage.

Meehan, E. (1984). Ratings and the Institutional Approach. A Third Answer to the Commodity Question. *Critical Studies in Mass Communication* 1 (2): 216-225.

Meehan, E. (1993). Commodity audience, actual audience: The blindspot debate. *Illuminating the Blindspots: Essays Honoring Dallas W. Smythe*, Norwood, NJ: Ablex. 378-400.

Menn, J. (2003). *All the rave: the rise and fall of Shawn Fanning's Napster*. New York: Crown Business.

Menta, R. (2001, July 20). Napster Clones Crush Napster. Take 6 out of the Top 10 Downloads on CNet. Retrieved May 11, 2015, from http://www.mp3newswire.net/stories/2001/topclones.html

Merrifield, A. (1993). Place and space: a Lefebvrian reconciliation. *Transactions of the institute of British geographers*, 516-531.

Merrifield, A. (2011). Crowd Politics or 'Here Comes Everybuddy'. *New Left Review*, (71), 103-

Meyrowitz, J. (1985). *No sense of place: The impact of electronic media on social behavior*. Oxford University Press.

Mezzurias (2014, June 26) Big news: today, our all-new iPhone app is ready for you. [Web blog comment]. Retrieved from http://blog.soundcloud.com/2014/06/26/the-new-soundcloud-iphone-app/

Minkowski H. (1964) Space and time, in Smart J. J. C ed. *Problems of space and time* Macmillan, New York, 297-312.

Morley, D. (2009). For a materialist, non-media-centric media studies. *Television & New Media*, 10(1), 114-116.

Morley, D., & Robins, K. (2002). *Spaces of identity: Global media, electronic landscapes and cultural boundaries*. Routledge.

Morris, J. W. (2012). Making music behave: Metadata and the digital music commodity. *New Media & Society*, 14(5), 850-866.

Mosco, V. (2009). *The political economy of communication: Rethinking and renewal* (Vol. 13). Sage.

mrbiggs (2012, Dec. 5) The Next SoundCloud Becomes SoundCloud [Web blog comment]. Retrieved from http://blog.SoundCloud.com/2012/12/04/next-becomes-SoundCloud/

Müller-Doohm, Stefan (2005). *Adorno: A Biography*. Malden, MA: Polity Press.

Napoli, P. (2003). *Audience Economics: Media Institutions and the Audience Marketplace*. Columbia University Press.

Napoli, P. M. (2011). *Audience evolution: New technologies and the transformation of media audiences*. Columbia University Press.

Nappy. (2014, February 21). Why We Think SoundCloud Is Preparing For A Giant Data Mining Operation. Retrieved March 11, 2015, from http://ca.complex.com/music/2014/02/SoundCloud-data-mining

Nappy. (2014, June 27). SoundCloud Boldly Releases New App, Allows Universal to Flag Your Account, and Quietly Announces Data Mining, All in One Month.

Retrieved March 14, 2015, from http://ca.complex.com/music/2014/06/SoundCloud-boldly-releases-new-app-allows-universal-flag-account-quietly-announces-data-mining-one-month

Negus, K. (1998). Cultural production and the corporation: musical genres and the strategic management of creativity in the US recording industry. *Media, Culture & Society*, *20*(3), 359-379.

Nunes, M. (2006). *Cyberspaces of everyday life* (Vol. 19). U of Minnesota Press.

Online Etymology Dictionary. (n.d.). Audience (n.) Retrieved January 26, 2015, from http://www.etymonline.com/index.php?term=audience

Owen, P. (2012, Dec. 6) The Next SoundCloud Becomes SoundCloud [Web blog comment]. Retrieved from http://blog.SoundCloud.com/2012/12/04/next-becomes-SoundCloud/

Owsinski, B. (2014, May 26). 3 Reasons Why Twitter Killed The SoundCloud Deal. Retrieved March 16, 2015, from http://www.forbes.com/sites/bobbyowsinski/2014/05/26/3-reasons-why-twitter-killed-the-SoundCloud-deal/

Pandora Internet Radio. (n.d.). Retrieved August 1, 2015.

Pandora Internet Radio. (2013, December 17). Privacy Policy. Retrieved May 25, 2015, from http://www.pandora.com/privacy

Pandora Media, Inc. November and December (2013) Stub Period and Calendar Q4 2013 Financial Results Conference Call http://edge.media-server.com/m/p/dw7u7j2u/lan/en Wednesday, February 05, 2014.

Pandora. (2014) Annual Report 2014 February 1 Retrieved December 31, 2014, from http://investor.pandora.com/phoenix.zhtml?c=227956&p=proxy

Pandora Internet Radio. (2015). Annual report 2015. Retrieved from http://investor.pandora.com/phoenix.zhtml?c=227956&p=proxy

Pandora Media, Inc. (2015b). Form 10-K 2015. Retrieved from SEC EDGAR website http://www.sec.gov/edgar.shtml

Park, D. J. 2007. *Conglomerate Rock: The Music Industry's Quest to Divide Music and Conquer Wallets* . Lanham, MD: Lexington Books.

Parks, L. (2005). *Cultures in orbit: Satellites and the televisual*. Durham, NC: Duke University Press.

Peoples, G. (2013, December 13) The Download Hits Middle Age and It Shows. Retrieved December 31, 2014, from http://www.billboard.com/biz/articles/news/digital-and-mobile/5827354/the-download-hits-middle-age-and-it-shows

Peterson, R. A., & Kern, R. M. (1996). Changing highbrow taste: from snob to omnivore. *American sociological review*, 900-907.

Peterson, T. (2013, November 14). Pandora Looks Past the Tracking Cookie By Mining User Data. Retrieved May 22, 2015, from http://adage.com/article/digital/pandora-past-tracking-cookie-mining-user-data/245269/

Peterson, T. (2013b) Streams For Sale: Music Is Latest Ad Battle. Advertising Age, Vol. 84, Issue 34

Pew Research Center (2012, December 12). Social Networking Popular Across Globe. Retrieved May 14, 2015, from http://www.pewglobal.org/2012/12/12/social-networking-popular-across-globe/

Pickard, V. (2014). *America's battle for media democracy: The triumph of corporate libertarianism and the future of media reform*. Cambridge University Press.

Prey, R. (2012). The Network's Blindspot: Exclusion, Exploitation and Marx's Process-Relational Ontology. *tripleC: Communication, Capitalism & Critique. Open Access Journal for a Global Sustainable Information Society*, *10*(2), 253-273.

PRWeb. (2012, February 12) Moodagent and Mixberry Media Announce Partnership to Put Mood Based Ad. Retrieved December 29, 2014, from http://www.prweb.com/releases/2012/2/prweb9220647.htm

Rainie, L., Kiesler, S., Kang, R., Madden, M., Duggan, M., Brown, S., & Dabbish, L. (2013). *Anonymity, privacy, and security online*. Pew Research Center.

Randall, S. (2012, Dec. 6). The Next SoundCloud Becomes SoundCloud [Web blog comment]. Retrieved from http://blog.SoundCloud.com/2012/12/04/next-becomes-SoundCloud/

Rdio: Unlimited Music Everywhere. (n.d.). Retrieved December 29, 2014, from https://www.youtube.com/watch?v=wksIZuOxf_0

Rentfrow, P. J., & Gosling, S. D. (2006). Message in a ballad: the role of music preferences in interpersonal perception. *Psychological science*, *17*(3), 236-242.

Rentfrow, P. J., McDonald, J. A., & Oldmeadow, J. A. (2009). You are what you listen to: Young people's stereotypes about music fans. *Group Processes & Intergroup Relations*, 12(3), 329-344.

Richardson, I. (2010) Faces, Interfaces, Screens: Relational Ontologies Of Framing, Attention And Distraction. *Transformations 18*.

Ricky, (2014, June 28) Big news: today, our all-new iPhone app is ready for you. [Web blog comment]. Retrieved from http://blog.soundcloud.com/2014/06/26/the-new-soundcloud-iphone-app/

Rigi, J. (2014). Foundations of a Marxist Theory of the Political Economy of Information: Trade Secrets and Intellectual Property, and the Production of Relative Surplus Value and the Extraction of Rent-Tribute. tripleC: Communication, Capitalism & Critique. Open Access Journal for a Global Sustainable Information Society, 12(2), 909-936.

Rigi, J. (2015) The Law of Value, Value-Form, Rent and "Cognitive Capitalism": A Critique of Post-Autonomous Marxists. (Unpublished manuscript).

Rigi J. and R. Prey. (2015) Value, Rent, and the Political Economy of Social Media, *The Information Society*. 31(5), 392-406.

Rogers, R. (2009). *The end of the virtual*. Inaugural address, University of Amsterdam.

Ronneberger, K. (2008) Henri Lefebvre and Urban Everyday Life: In Search of the Possible. *Space, Difference, Everyday Life: Reading Henri Lefebvre*. Nova York/Londres, Routledge.

Ross, A. (2009, Oct. 16th). *On the Digital Labor Question*. Lecture conducted at Vera List Center for Art and Politics at The New School, New York.

Rotta, T. N., & Teixeira, R. A. (2012). Valueless Knowledge-Commodities and Financialization: Productive and Financial Dimensions of Capital Autonomization. *Review of Radical Political Economics*.

Rowley, L. (2014, Aug. 25) “Spotify’s Got Audience Segmenting Chops, But Ad Targeting Still to Come”. Retrieved December 29, 2014, from http://www.adexchanger.com/ad-exchange-news/spotifys-got-audience-segmenting-chops-but-ad-targeting-still-to-come?

Rowley, L. (2014, December 5). Spotify Queues Up Local Targeting, Courtesy Of Triton Digital *AdExchanger*. Retrieved August 1, 2015.

Rubin, I. I. (1972). *Essays on Marx's Theory of Value*, trans. M. Samardzija and F. Perlman. Detroit: Black and Red.

Rusli, E., Karp, H., & MacMillan, D. (2014, Dec. 9). SoundCloud’s Valuation Could Top $1.2 Billion With New Fundraising. Retrieved March 3, 2015, from http://blogs.wsj.com/digits/2014/12/09/SoundClouds-valuation-could-top-1-2-billion-with-new-fundraising/

Saco, D. (2002). *Cybering democracy: Public space and the Internet* (Vol. 7). U of Minnesota Press.

Schiller, D. (1988). How to think about information. *The political economy of information*, 27-43.

Schiller, D. (2007). *How to think about information*. Urbana, IL: University of Illinois Press.

Schmid, C. (2008). Henri Lefebvre’s theory of the production of space: Towards a three-dimensional dialectic. *Space, Difference, Everyday Life: Reading Henri Lefebvre*, 27-45.

Scholz, T. (Ed.). (2012). *Digital labor: The internet as playground and factory*. Routledge.

Simon, H. A. (1971). Designing organizations for an information-rich world. *Computers, communication, and the public interest*, 37, 40-41.

Singer, N. (2014, Jan. 4). Listen to Pandora, and It Listens Back. Retrieved May 21, 2015, from http://www.nytimes.com/2014/01/05/technology/pandora-mines-users-data-to-better-target-ads.html?_r=2&

Sisario, B. (2014, Aug. 21). Popular and Free, SoundCloud Is Now Ready for Ads. *The New York Times.* Retrieved July 12, 2015, from

http://www.nytimes.com/2014/08/21/business/media/popular-and-free-soundcloud-is-now-ready-for-ads.html?_r=0

Smith, C. (2014, Jan. 18) Spotify hints it could monitor your heart to give you the right beat. Retrieved December 29, 2014, from http://www.techradar.com/news/internet/spotify-hints-it-could-monitor-your-heart-to-give-you-the-right-beat-1216457

Smulyan, S. (1994). *Selling radio: The commercialization of American broadcasting, 1920-1934*. Smithsonian Inst Press.

Smythe, D. (1981). *Dependency road: Communications, capitalism, and Canada*. Norwood, MA: Ablex Publishing Corporation

Smythe, D. W. (1977). Communications: Blindspot of Western Marxism. *CTHEORY*, 1(3), 1-27.

Soja, E. W. (1989). *Postmodern geographies: The reassertion of space in critical social theory*. Verso.

Soja, E. W. (1996). *Thirdspace: Journeys to Los Angeles and other real-and-imagined places* Oxford: Blackwell

SoundCloud. (n.d.). SoundCloud | What is On SoundCloud? Retrieved March 17, 2015, from http://help.SoundCloud.com/customer/portal/articles/1659059-how-can-i-become-an-on-SoundCloud-premier-partner-

Spotify without Facebook. (2012, March 5) Retrieved December 29, 2014, from https://community.spotify.com/t5/Help-Accounts-and-Subscriptions/Spotify-without-Facebook/td-p/15843

Spotify. (n.d.). Spotify Explained. Retrieved April 1, 2015, from http://www.spotifyartists.com/spotify-explained/

Spotify. (n.d.). Music for everyone. Retrieved August 1, 2015, from https://www.spotify.com/us/brands/insights/ad-recall/

Stanek, L. (2008) Space as concrete abstraction. *Space, Difference, Everyday Life: Reading Lefebvre*, 62-79.

Steinhardt, J. (2015, Feb. 25). *Future of Music Coalition*. Retrieved March 16, 2015, from https://www.futureofmusic.org/blog/2015/02/25/future-no-alternative

Stevenson, M. (2012), After Virtuality: A Postmortem on Early Internet Culture. *Blind, 28*. Retrieved 12 May 2015 from: http://www.ziedaar.nl/article.php?id=413.

Stiernstedt, F. (2008) Maximizing the power of entertainment. The audience commodity in contemporary radio. *Radio Journal: International Studies in Broadcast & Audio Media* 6.2-3. 113-127.

Straw, W., & Boutros, A. (2010). *Circulation and the city: essays on urban culture* (Vol. 3). McGill-Queen's Press-MQUP.

Tanner, A. (2013, June 17). The Web Cookie Is Dying. Here's The Creepier Technology That Comes Next. Retrieved February 12, 2015, from http://www.forbes.com/sites/adamtanner/2013/06/17/the-web-cookie-is-dying-heres-the-creepier-technology-that-comes-next/

Terranova, T. (2012) Free Labor, in Scholz, T. (Ed.). (2012). *Digital labor: The internet as playground and factory*. Routledge. p33-57.

Tsoumakos, D., & Roussopoulos, N. (2003). A Comparison of Peer-to-Peer Search Methods. *Paper presented at the International Workshop on the Web and Databases*.

The Echo Nest, (n.d.). Our Company. Retrieved July 9, 2015 from http://the.echonest.com/company/

The Echo Nest. (2013 Oct. 20) White paper: Music Audience Understanding. Retrieved February 6, 2014 from http://corpcdn.echonest.com.s3.amazonaws.com/filer_private/2013/10/20/the_echonest- music_audience_understanding.pdf

The Echo Nest. (2013a, Aug.12). White Paper: How Music Services Can Acquire, Engage, and Monetize High-Value Listeners. Retrieved May 19, 2015, from http://musicalidentity.echonest.com/post/58057887326/engagement-white-paper

The Echo Nest. (2013b, Nov. 21). How The Echo Nest Is Reinventing Music Advertising. Retrieved May 19, 2015, from http://blog.echonest.com/post/67657862588/how-the-echo-nest-is-reinventing-music-advertising

The Echo Nest. (2013c, Nov. 21). The Echo Nest and TargetSpot Partner To Bring Smarter Advertising To Online Radio. Retrieved May 19, 2015, from http://www.prnewswire.com/news-releases/the-echo-nest-and-targetspot-partner-to-bring-smarter-advertising-to-online-radio-232825671.html#

The Echo Nest. (2013d, Nov. 21). The Echo Nest Expands Its Music Intelligence Platform to Digital Music Advertising. Retrieved May 19, 2015, from http://the.echonest.com/pressreleases/echo-nest-expands-its-music-intelligence-platform-digital-music/

The Echo Nest. (2014, Jan. 27). Music Audience Understanding. Retrieved May 19, 2015, from http://corpcdn.echonest.com.s3.amazonaws.com/filer_private/2014/01/27/audience_understanding_finalx.pdf

Theo-G. (2012, Dec. 6) The Next SoundCloud Becomes SoundCloud [Web blog comment]. Retrieved from http://blog.SoundCloud.com/2012/12/04/next-becomes-SoundCloud/

Tim, (2014, June 27) Big news: today, our all-new iPhone app is ready for you. [Web blog comment]. Retrieved from http://blog.soundcloud.com/2014/06/26/the-new-soundcloud-iphone-app/

Titlow, J. (2014, June 26). Inside SoundCloud's Radically Minimal New iPhone App. Retrieved March 19, 2015, from http://www.fastcolabs.com/3032413/inside-soundclouds-radically-minimal-new-iphone-app

Tschmuck, P. (2013, June 17) Is Streaming the Next Big Thing? - The Business Models of Music Streaming Services. Retrieved December 29, 2014, from http://musicbusinessresearch.wordpress.com/2013/06/17/is-streaming-the-next-big-thing-the-business-models-of-music-streaming-services/

Turow, J. (2008) *Niche Envy: Marketing Discrimination in the Digital Age*. MIT: Cambridge, MA.

Turow, J. (2012). *The Daily You: How the new advertising industry is defining your identity and your worth*. Yale University Press.

Van Buskirk, E. (2011, Sept. 27) Facebook Music's Biggest Loser Lastfm. *Evolver.fm*, Retrieved December 30, 2014, from http://evolver.fm/2011/09/27/facebook-musics-biggest-loser-last-fm/

Van Buskirk, E. (2011b, Sept. 30) Spotify Responds to Facebook Oversharing with Guilty Pleasures Mode. *Evolver.fm*, Retrieved December 30, 2014, from http://evolver.fm/2011/09/30/spotify-responds-to-facebook-oversharing-with-guilty-pleasures-mode/

Van Der Wal, T. (2007). *Folksonomy coinage and definition.* http://www.vanderwal.net/folksonomy.html

Van Dijck, J. (2014). Datafication, dataism and dataveillance: Big Data between scientific paradigm and ideology. *Surveillance & Society*, 12(2), 197-208.

Vanderbilt, T. (2014, February 17). Echo Nest knows your music, your voting choice, *Wired UK*. Retrieved May 19, 2015, from http://www.wired.co.uk/magazine/archive/2014/02/features/echo-nest/viewall

Varanini, G. (2000, March 3). Q&A: Napster Creator Shawn Fanning. *ZDNet News* [Online News] Retrieved Feb 28, 2014, from http://www.zdnet.com/news/q-a-napster-creator-shawn-fanning/96066

Vercellone, C. (2010). The Crisis of the law of value and the Becoming-Rent of Profit in A. Fumagalli and D, Mazzadra (eds.) *The Crisis of the Global Economy*, Los Angeles: Semiotext(e), 85-118.

Walker, R. A. (1975). Contentious issues in Marxian value and rent theory: A second and longer look. *Antipode*, *7*(1), 31-53.

Webster, J. G. (2011). The duality of media: A structurational theory of public attention. *Communication Theory*, 21(1), 43-66.

Wertheim, M. 1999: *The pearly gates of cyberspace: A history of space from Dante to the internet*. Virago Press.

Whitaker, R. (1999). *The end of privacy: How total surveillance is becoming a reality*. The New Press.

White, E. (2014, March 26). The Echo Nest CTO Brian Whitman on Spotify Deal, Man Vs. Machine, Why Pandora 'Freaks' Him Out (Q&A). Retrieved May 14, 2015,

from http://www.billboard.com/biz/articles/news/digital-and-mobile/5944950/the-echo-nest-cto-brian-whitman-on-spotify-deal-man-vs

Whitman, B. (n.d.). How well does music predict your politics? Retrieved May 19, 2015, from http://notes.variogr.am/post/26869688460/how-well-does-music-predict-your-politics#diverse

Wilson, J. (2013). "The Devastating Conquest of the Lived by the Conceived": The Concept of Abstract Space in the Work of Henri Lefebvre. *Space and Culture*,

Wise, J. M. (1995). Technology and social space beyond the modern episteme (Doctoral dissertation, University of Illinois at Urbana-Champaign).

Yu, J., Li, M., Hong, F., & Xue, G. (2006). Free-Riding Analysis of BitTorrent-like Peer-to-Peer Networks. *Paper presented at the IEEE Asia-Pacific Conference on Services Computing*

Zittrain, J. (2008). *The future of the internet--and how to stop it*. Yale University Press.