The Digitalization of Music: To Stream, To Spend, or To Steal?

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Abstract

A music-streaming format delivers audio files or radio waves on a continuous basis, often through a subscription or verified user account. Streaming can be hosted traditionally, on a computer or Internet-enabled device, or via Bluetooth or other connectivity technology. Today, audio streaming accounts for almost one-third of the music industry; this forces record labels, organizations, and legislators, amongst others, to question the role played by music pirates in an industry so dominated by technological means of transmission. Critics suggest that there may be a link between streaming and piracy, such that the former enables the latter and that the two can coexist in a world dominated by music-streaming services. This link might exist within, and be more prevalent within, certain demographics, such as male millennials, but there is no evidence that all music streamers and paid subscribers.

Keywords: music streaming, P2P file-sharing, music piracy, sound culture

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Introduction

Music streaming continues to grow, a force to be reckoned with, even as the rise in sales of vinyl has gone up in the last few years. Total revenue from all streaming services, which includes both passive and active streaming media, surpassed that of paid downloads by $1 million last year (Rosenblatt, 2016). According to the Recording Industry Association of America's (RIAA) 2016 Mid-Year Report on Music Shipment and Revenue Statistics, streaming music revenues from the first half of 2016 totaled $1.6 billion, "up 57% year-over-year, and accounted for 47% of industry revenues compared with 32% [in the first half of 2015]," a figure that includes revenues from subscription services, streaming radio services, and non-subscription on-demand services.

The importance of exploring these streaming services is clear, if only at first for economic reasons: it is expected that download sales will continue to decline in 2016 at a rate of 9%, the same rate seen over the last few years (Rosenblatt, 2016). This decline in sales, replaced by the rapid growth and adoption of on-demand streaming—which grew 101% over the first half of 2016, accounting for 30% of the industry whole in the same period (Friedlander, 2016)—puts into question the viability of traditional revenue flows for an industry once reliant on the sales of, in succession, CDs, paid downloads, and, most recently, the live show. In the history of music, nothing has ever grown as quickly as the streaming industry does and continues to do. This fact calls into consideration the streaming culture as an entity in itself, significant because it is not just a component of the music industry, but also a component of the communication technologies industry at large.

This paper will examine the various streaming services available to consumers today and discuss whether piracy is still a relevant concern in the era of legal music streaming and paid music downloads. To provide context, the paper will begin with a brief history of music streaming, legal and illegal. Next, five of the major free and premium, on-demand and passive streaming services— Pandora, Spotify, Apple Music, iHeartRadio, and YouTube— will be detailed, along with a look at the streaming audience (demographics and rationale). Finally, music piracy and its role in the streaming world will be explored.

Music Streaming: From the Muzak to Pandora

History of Music Streaming

The earliest form of "true" music streaming (let "true" allow for the closest resemblance to modern-day streaming technology) began with the Muzak, introduced in 1930 as a private venture after two decades of modifying its core technology (Baumgarten, 2012). Private use of the Muzak was quickly rendered obsolete once the radio was introduced and revolutionized sound culture. "Sound culture," a term coined by media researcher and theorist Jonathan Sterne, is meant to encompass the auditory aspect of society (Sterne 2003).

"Sound culture" has taken on an entirely new context in today's world of digital music streaming and the marked increase in the accessibility, free and illegal, of music. Sterne wrote of the commodification of sound, and this commercial exchange has never been more obvious or profitable than it is today, but before this exchange, and after the Muzak's relegation to purveyor of background noise in retail stores, there was the radio.

The radio came on the scene around the turn of the 20th century and is still unprecedented in its scope and reach; it proved its enduring effect when it survived the introduction of the television in the 1940s. Today, there are approximately 800 million radios in the United States. In a survey that asked after the listening habits of people aged 18 and over who have driven/ridden in a car in the last month (from when survey was conducted), 84% reported ever using AM/FM radio as an audio source in their primary car. Only 21% reported ever having used online radio (assumed to refer to services such as Pandora and iHeartRadio). (Edison Research and Triton Digital, 2016)

It is important to note, however, that online radio listening in the car has gone up in the past few years; thirty-seven percent of people say that they have listened to online radio via a cell phone connected to a car, up from only 26% in 2014 (Edison Research and Triton Digital, 2016).

Online radio is a form of passive streaming that lets listeners decide which genres or types of music they like and select "stations" from which the format will shuffle music. (On-demand streaming, in contrast, allows listeners to choose specific songs, artists, albums, etc. to play when they wish.) One thing that traditional radio does not allow for, and that online radio does to a higher degree, is media filtering. AM/FM radio listeners are limited to their local frequencies, whereas online radio users can choose from up to hundreds of curated stations, effectively avoiding what they do not want to hear, including traditional radio advertising and talk programs and even songs they simply do not like, even if they cannot truly pick and choose.

Before the dawn of online radio (and on-demand streaming services), there were peer-to-peer (P2P) file-sharing formats, like Napster, formerly Rhapsody under

RealNetworks, “the world’s longest-running streaming service” (Gensler, 2016). Acquired from BestBuy by Rhapsody in 2011, Napster fully rebranded itself as a licensed pay service in July 2016 after being sued in 2001 by major record labels claiming copyright infringement against the company (Gensler, 2016). By August of 2011, Napster had 800,000 users who were paying either $10 or $15 for its premium service (Sisario, 2011). The service last reported 3.5 million paying subscribers and “claims to be in the top five of global music streaming services” (Gensler, 2016), though it seems to be struggling: 2015 saw doubled losses for the company, revenue saw growth of less than 17%, and gross profit essentially did not exist (Peoples, 2016).

In an attempt to compete with the likes of Spotify and Apple Music, Napster has announced partnerships with several companies to keep their name on the competitive scene— or to keep their top five spot that they claim to have— that is the world of music streaming. As of November 2016, Sprint dropped their partnership with Spotify in favor of a deal with Napster that gives Sprint customers the option to pay their Napster bill in conjunction with their Sprint phone bill (Gensler, 2016).

The first decade of the 21st century saw more than one instance of suit filed against a P2P service. In 2010, LimeWire was found liable to copyright infringement after record labels filed suit in 2006; ironically, the service continued to thrive even as many file-sharing sites closed their virtual doors following the Napster suit.

Current Music Streaming Services

In 2010, the music industry reported that 8 million people were subscribed to a music streaming service; four years later, there were 41 million paid subscribers, and “countless more free-service members” were active streamers, according to the

International Federation of the Phonographic Industry (IFPI). The current estimate puts the figure at 68 million paid subscribers (IFPI). Paid subscription services, such as Spotify Premium and Apple Music, are growing at a much faster rate than are free services, down 20% (Rosenblatt, 2016). It is estimated that the former accounts for over four times the revenue generated by its free counterparts (Rosenblatt, 2016) and, according to the IFPI, "streaming has grown to represent 19 per cent of global industry revenues, up from 14 per cent in 2014." Paid subscription services involve a monthly fee and typically offer users an ad-free experience and offline downloading (should the subscription be cancelled, these downloads will no longer be accessible), features that free versions/services usually do not offer.

Spotify. Spotify, found in 2015 to be the most popular digital music streaming service (Stutz 2015), is a Swedish company launched in 2008 that offers listeners a simple, but effective idea: "Soundtrack your life with Spotify." With millions of songs available to stream and new albums sometimes available as early as one day after their official release, Spotify's service, even in its most basic form, offers "more" to users. The service is constantly innovating, rolling out new features regularly, such as the "Daily Mix," introduced October 2016, which offers listeners an assortment of music that includes their most recently listened to songs, their old favorites, and songs that they might like based on their preferences (Spotify). Offerings like this, along with dozens of curated and user-specific playlists, help Spotify to bring a new dimension of value to music streaming (Slager, 2016). Users want more within the streaming format because Spotify has already made "more" available and, moreover, fostered an expectation of innovation and need identification.

Spotify offers two services to appeal to a wider consumer base: the most basic, free service that puts a cap on on-demand listening for mobile and does not allow for offline downloading; and Spotify Premium, a paid subscription, which for a monthly fee grants listeners unlimited access to their favorite music, higher streaming quality, and offline downloading, limited only to mobile capacity. Different plan rates make what might otherwise be considered an expensive service both more affordable and more attainable. (Spotify)

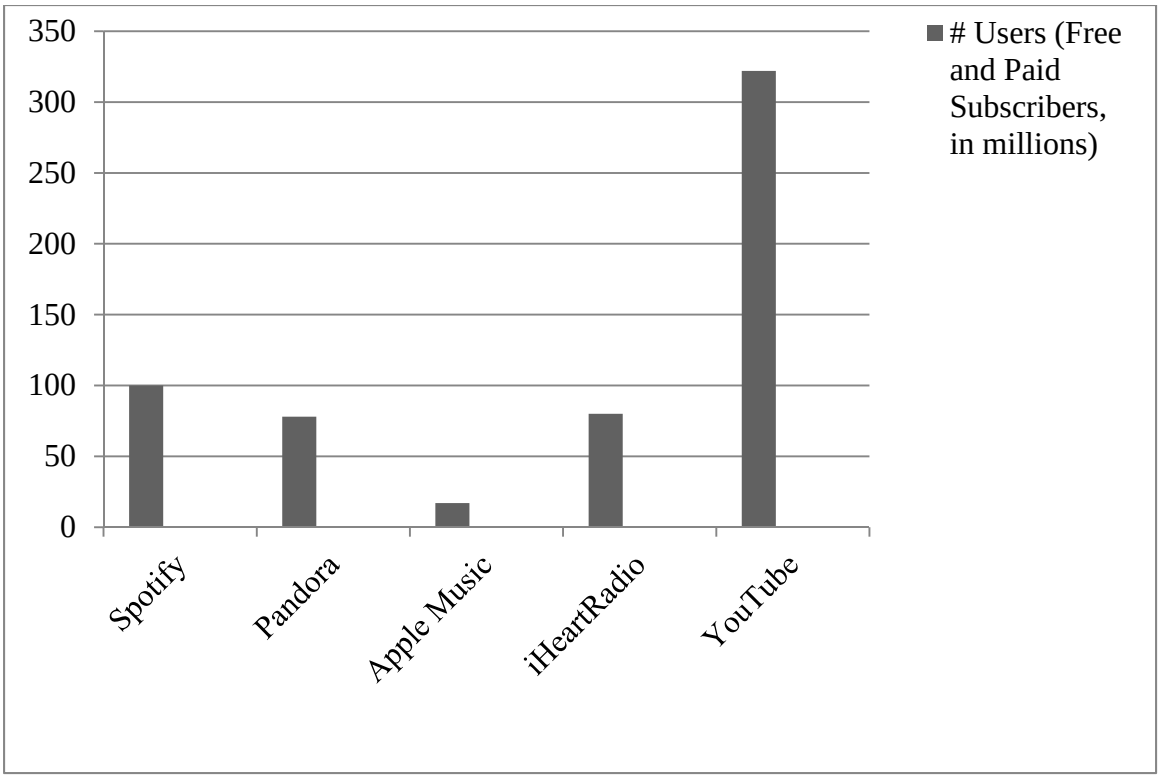
As of May 2016, Spotify had 30 million paying users and has close to 100 million users total. Despite competition, Spotify remains the market leader in music streaming services (Shanley & Weber, 2016).

Pandora. Pandora Internet Radio is, like traditional radio, a passive streaming format that lets users create up to 100 unique "stations." Users are limited by ads and the number of songs that they can skip. Pandora offers an ad-free, paid alternative, Pandora One. The subscription promises more skips, fewer timeouts, and premium audio quality when listening on the Web. The heart of Pandora's brand is the Music Genome Project, a music analysis project launched in 2000. According to Pandora, "each song in the Music Genome Project is analyzed using up to 450 distinct musical characteristics by a trained music analyst." The format then "recognizes and responds to each individual's tastes" for an experience beyond mere personalization. (Pandora)

Perhaps this über-customization is what gives Pandora an edge. Despite its passivity, it is widely popular in today's culture that is so heavily dependent on instant gratification and the power of choice. In 2016, 25% of the total population aged 12 and older reported listening to Pandora in the last week, while 26% reported listening to

Spotify, iHeartRadio, or Apple Music during the same period, at 10%, 8%, and 8%, respectively (Edison Research and Triton Digital, 2016). As of October 2016, Pandora had 78 million active listeners and 4 million paid subscribers (SNL Financial, 2016).

# of People Using the Five Major Streaming Services, 2016 (Fig. 1)



iHeartRadio. iHeartRadio brands itself as the "free all-in-one, industry-leading digital radio service" that gives users access to thousands of live FM stations around the country, as well as the option to create custom stations free of commercials or to listen to a curated station. The iHeart catalog has 24 million songs from over 830,000 artists; the medium reached 20 million registered users in just 13 months, "faster than all other

popular entertainment and communication platforms [including Pandora and Spotify]." (iHeartMedia)

As of January 2016, the free app surpassed 80 million users, according to parent company iHeartMedia, formerly Clear Channel, which holds the rights to 850 radio stations and billboards across the country, making it the "largest radio station operator in the U.S." (Keller & Shaw, 2016).

The popularity of iHeartRadio could lie in one of two (or both) features: the service is only available as a free format; and users have access to many of their FM favorites in addition to online-only stations. Despite iHeartRadio being a big player in the streaming game, there is little information available on it aside from the most basic of usage statistics and features.

Apple Music. Apple Music launched in 2015 and in less than one year has amassed 17 million paid subscribers (SNL Financial, 2016). Apple Music offers a free trial period of three months but requires users to upgrade to the paid service to continue using it; in other words, there is no free, ad-supported version. The question that Apple Music poses is whether people will use it, even if other services are higher-ranked and considered better by industry standards, simply because it is there— part of an integration with Apple devices and the iOS system—as is the case with map apps: "Apple Maps is used 3.5 times more frequently than [Google Maps]" just because it comes pre-installed (Elmer-DeWitt, 2015). Apple Music also offers users integration at the music-level; personal music collections and the Apple Music library are available in one place (Spotify integrates users' personal collections with their paid-for libraries, as well).

Like Spotify, the format offers curated playlists to its listeners, but it adds another dimension to the "expectation factor:" Apple promises subscribers exclusive music videos, concert films, and live shows. Beats 1, Apple's online radio station, brings live DJ broadcasts and radio programs to subscribers; DJs like Zayne Lowe and Dr. Dre and icons like Elton John and Mary J. Blige are a few of the highbrow music moguls who host an affiliated show or program. (Apple)

In essence, Apple Music is a hybrid of passive and active streaming because it combines traditional, passive online radio the likes of Pandora and iHeartRadio with on-demand streaming and the "more" factor the likes of Spotify.

YouTube. YouTube might not make the list were the average person asked to name the major music streaming services that s/he is familiar with, but YouTube is, in fact, a streaming platform, and a huge one at that. As of February 2016, 63% of the total U.S. population of over 322 million had used the video-sharing platform to watch music videos or listen to music, while 43% and 53% reported taking part in these activities in the past week and in the past month, respectively (Statista, 2016). YouTube self-reports over one billion users, and daily, hundreds of millions of hours are logged streaming content (YouTube).

Despite these huge numbers, "music videos and music-related content" account for just over 4% of total traffic to/time spent on the site (Resnikoff, 2016). A categorical view puts things into a different perspective, with music content holding 11% of the view-by-category share (Resnikoff, 2016). This is still barely a fraction of the total number of views, especially considering that the platform hosts an estimated 1 billion songs (IB Intelligence).

YouTube's music channel— "YouTube's music destination featuring top tracks and popular hits from a variety of genres"— that launched in September of 2013 has nearly 97 million subscribers as of November 2016 (YouTube), while ad-free YouTube Red has achieved nowhere near this kind of growth. The service, which charges $9.99/month after a one-month free trial and includes a Google Play Music subscription with no additional charge, has only 1.5 million subscribers since it launched at the end of October 2015 (BI Intelligence). The YouTube Music app, via a YouTube Red subscription, is available only on supported smartphones and gives users the option to download certain audio files that will be available for offline streaming for up to 30 days (YouTube). Whether Google's latest venture will become a major player as a music subscription service remains to be seen.

Piracy: Demographics, Practices & Economic Consequence

According to the RIAA, music piracy includes more than one action, from unauthorized P2P downloads to "illegally copying music using streamripping software or mobile apps" (RIAA). Rhapsody and LimeWire perhaps set the precedent for how many of today's music scalpers still operate. These early forms of P2P file-sharing may have paved the way for many pirates seeking the most streamlined ways of acquiring vast numbers of downloads for free. Should they be successful, they could have access to "some 43 million songs available across more than 70 authorized services in the United States, and growing" (RIAA).

One relevant, but not necessarily the most popular, piracy approach is the YouTube-to-MP3 converter. Anyone— pirates, listeners with no interest in profitability but who want to avoid fees, DIY artists seeking samples— can copy and paste, from

YouTube, an MPEG-referring URL into the converter to create an MP3 file with which, in theory, they can do whatever they wish. This pirated MP3 file, while not the highest playback quality, especially not when compared with that of paid downloads or songs available on streaming services, is now easily distributable.

According to MusicWatch Inc., a resource for data on music consumers, in 2015, music listeners aged 18-35 accounted for only 37% of all *music streamers* ("listened to music via free/paid online radio or on-demand services for at least one hour in an average week in the past year"), while also accounting for half of all *P2P downloaders* ("downloaded at least one track for free from a file-sharing service in the past year"). Further, this demographic group comprised nearly 60% of paid subscribers. Paid subscriptions are evenly split between men and women, but there is a notable gender discrepancy between the figures for P2P downloaders and music streamers. In general, 59% of men participated in P2P downloading, while only 41% of women engaged in this activity. Conversely, 53% of women streamed music, while 47% of men did. (MusicWatch Inc., 2015)

In a 2007 analysis, the Institute for Policy Innovation (IPI) Center for Technology Freedom found that the U.S. economy suffers $12.5 billion in annual losses as a consequence of piracy, globally and domestically (Siwek, 2007). Quantifying online music piracy remains a difficult task, however.

The Link Between Streaming and Piracy

Even with the many free and paid alternatives available to consumers today, music piracy still exists. A 2015 side-by-side analysis of music streaming and music piracy indicates only three key differences between the two: the ability to link songs to

social media sites versus sharing them directly with friends; low risk versus high risk of computer viruses; and no penalties versus fines/jail time (Aguiar & Waldfogel, 2015). The price difference— Spotify values a song at seven-one-thousandth of a cent and piracy assigns no value— seems so insignificant that it is difficult to fathom why music pirates would risk jail time to acquire music for free. If every 100 songs is worth seven cents based on Spotify's algorithm, and there are millions of songs, the incentive becomes clearer: pirates can download and distribute mass quantities of music and rake in profits on a large scale. Borja and Dieringer suggest that pirates might be using "discovery formats" such as Spotify to find new music that they will later acquire illegally (Borja and Dieringer, 2016). Whether pirates are likely to use streaming services as discovery tools to supplement piracy remains unclear because a distinction would need to be made between those who pirate for profit and those who pirate for personal money saving.

The volume of music files that is being pirated is also a variable at play. How many songs are illegally "ripped" by the average pirate in the course of a year? Does the average pirate purchase music and/or pay for a streaming service(s) as well, and if so, to what degree as compared with ripping? One study concluded that "those who pirated music bought just as much music as people who do not pirate" (Carlisle, 2014). Another study, the relevancy of which may be disputed for its timeliness, found that pirates are ten times more likely to buy music and that they comprise the largest audience for digital sales of music (Michaels, 2009). Now that digital sales are on the decline, and streaming is the fastest growing sect of the music industry, it is uncertain whether the possibility that pirates are purchasing music is significant in the scope of piracy at large.

In a study that surveyed over 1000 college students at two South Florida universities, it was found that "music streaming increases the likelihood of piracy by about 11%, thus, providing evidence of the complementary feature between streaming and piracy" after "78% of [survey] participants self-reported to have downloaded music illegally in the past month" (Borja and Dieringer, 2016). Another study conducted by Borja and Dieringer that focuses on college students and piracy concludes "that music streaming increased the likelihood of engaging in music piracy by about 20%" (Borja and Dieringer, 2015).

Eleven percent (nor 20%, for that matter) does not seem a sufficient figure to conclude a correlation, especially because this study only considers the habits and behaviors of college students (median age of those surveyed is 20.3 years) and does not take into account a large portion of the population that is using a music streaming service— nearly 75% of music streamers are aged 26 and over (MusicWatch, 2015). Further, the study acknowledges that "younger consumers are more likely to pirate," which limits the scope from the outset. The 18-25 demographic group, which includes college students, makes up only 16% of music streamers but comprises one-quarter of P2P downloaders (MusicWatch, 2015).

Taking into consideration these figures, in conjunction with Borja and Dieringer's findings and additional data from MusicWatch (pg. 11), it can be posited that male millennials at large (ages 18-35) and not just college students generally, are more likely to pirate music and/or participate in P2P downloading than other groups. Cost, peer pressure, and perceived low risk are cited as contributing factors in piracy amongst

college students (Borja and Dieringer, 2015), and these criteria can be easily applied to the average millennial.

Another aspect of music streaming— the value role that it plays in the everyday lives of users and subscribers— is something to be considered through the lens of music piracy. Slager (2016) considers three elements of value in his thesis on music value in the digital age: financial value, content value, and social value. Financial value is of utmost importance to rights holders (record labels) and streaming platforms, whom/which receive 45.6% and 20.8% of profits from streaming services, respectively (Masmick, 2015). Content value is of utmost importance, and "has seen the largest change in materiality," to artists and platforms seeking to offer "more," like Spotify and Apple Music (Slager, 2016). Finally, social value is of utmost importance to many users and subscribers, and this third value may prove the most pervasive in the lives of social media-connected millennials.

The social value aspect may be what millennials perceive as lacking in many or some of today's streaming platforms and could be part of the reason why 25% of them are turning to illegal means of acquiring music (MusicWatch, 2015). In an interconnected age where people can share all parts of, and all moments in, their lives with their friends instantaneously, being unable to share a full-length album or a hot new track because of copyright laws can be seen as inconvenient. P2P downloads not only find a way around copyright laws, but also save downloaders over $2.3 million in annual paid permanent downloads (Friedlander, 2015).

Conclusions

Changing value dynamics for both the music industry and music listeners will impact how and if music piracy rates will rise with the use and expansion of music streaming services. YouTube, in particular, makes music URLs /MPEGs widely available. Rigid crackdowns on how these MPEG files can be copied from YouTube could limit pirates in their ability to convert them into MP3 files. If further research revealed a strong connection between perceived social value and piracy in the 18-34 demographic group, an expansion of social sharing capabilities on the part of discovery formats such as Spotify could significantly reduce millennial piracy rates. Whether this could be accomplished in accordance with copyright controls and artist and label rights, while still upholding the brand image of the streaming format, is uncertain.

Finally, continued educational efforts, perhaps in collaboration with popular artists, to promote awareness of the economic and intellectual losses associated with piracy, or even the benefits of using a streaming service, could shape the decisions of the average, not-for-profit millennial pirate. The RIAA claims that music piracy evolves with technology, so maybe streaming will someday go hand-in-hand with piracy (RIAA). For now, evidence of this link is preliminary, and music listeners are faced with a choice: to stream, to spend, or to steal.

References

Aguiar, L., Waldfogel, J., 2015. Streaming reaches flood stage: Does Spotify stimulate or depress music sales? National Bureau of Economic Research, Working Paper WP21653.

Apple. (n.d.). *Apple Music.* Retrieved 2016, November 16, from http://www.apple.com/apple-music/

Baumgarten, L. (2012, September 27). "Elevator Going Down: The Story of Muzak." *Red Bull Music Academy*. Retrieved http://daily.redbullmusicacademy.com/2012/09/history-of-muzak

BI Intelligence (2016, November 4). YouTube Red's slow but promising growth. *Business Insider*. Retrieved http://www.businessinsider.com/youtube-reds-slow-but-promising-growth-2016-11

Borja, K., & Dieringer, S. (2016). Streaming or stealing? The complementary features between music streaming and music piracy. *Journal of Retailing and Consumer Services*, 32, 86-95. http://dx.doi.org/10.1016/j.jretconser.2016.06.007

Borja, K., Dieringer, S., & Daw, J. (2015). The effect of music streaming services on music piracy among college students. *Computers in Human Behavior*, 45, 69-76. http://dx.doi.org/10.1016/j.chb.2014.11.088

Carlisle, S. (2014). Copyright Piracy and the Entertainment Industries: Is the Effect Massive or Negligible? Retrieved http://copyright.nova.edu/copyright-piracy-entertainment-industries/#note-587-4

Edison Research and Triton Digital. (2016). *The Infinite Dial 2016* (Rep.). [Bar charts illustrating audio habits.] *Audio Sources Used in Primary Car*; *Online Radio*

Listening in Car; Listened in the last week to…

Elmer-DeWitt, P. (2015, June 16). Why 3.5 times more Apple Users choose Apple Maps over Google Maps. *Fortune*. Retrieved from http://fortune.com/2015/06/16/apple-google-maps-ios/

Friedlander, J. P. (2015). *News and notes on 2015 RIAA shipment and revenue statistics* (Rep.). Retrieved https://www.riaa.com/wp-content/uploads/2016/03/RIAA-2015-Year-End-shipments-memo.pdf

Friedlander, J. P. (2016). *News and notes on 2016 mid-year RIAA music shipment and revenue statistics* (Rep.). Retrieved http://www.riaa.com/wp-content/uploads/2016/09/RIAA_Midyear_2016Final.pdf

Gensler, A. (2016, November 3). Napster, formerly Rhapsody, announces a slate of partnerships to inflate its consumer base. *Billboard*. Retrieved http://www.billboard.com/biz/articles/news/legal-and-management/7565452/napster-formerly-rhapsody-announces-a-slate-of

iHeartMedia. (n.d.). *iHeartMedia*. "iHeartRadio." Retrieved November 16, 2016, from http://iheartmedia.com/CCME/Pages/iHeart.aspx

International Federation of the Phonographic Industry (IFPI). Global Statistics. "Facts and States." Web page. http://www.ifpi.org/facts-and-stats.php

Keller, L. J. & Shaw, L. (2016, February 4). Private equity's iHeartRadio chokes on debt load it can't replay. *Bloomberg*. Retrieved https://www.bloomberg.com/news/articles/2016-02-04/private-equity-s-iheart-radio-chokes-on-debt-load-it-can-t-repay

Masmick. (2015). [Pie chart depicting how streaming revenues are distributed in

the music industry.] *TechDirt*.

Michaels, S. (2009, April 21). Study finds pirates 10 times more likely to buy music. *The Guardian.* Retrieved https://www.theguardian.com/music/2009/apr/21/study-finds-pirates-buy-more-music

MusicWatch/2015 Annual Music Study (2015). "Music Consumer Profile- 2015." https://www.riaa.com/wp-content/uploads/2016/08/MusicWatch-Music-Consumer-Profile-2015.pdf

Pandora. (n.d.) *About*. Retrieved November 16, 2016, from http://www.pandora.com/about

Peoples, G. (2016, March 2). Rhapsody's losses nearly doubled last year to $35.5 million. *Billboard*. Retrieved http://www.billboard.com/articles/business/6897287/rhapsody-losses-double-2015

Resnikoff, P. (2016, August 16). Music is just 4.3% of YouTube traffic, research shows. *Digital Music News.* http://www.digitalmusicnews.com/2016/08/16/music-5-percent-youtube/

RIAA. (2016). *Resources & Learning*. "About Piracy." "For Students & Educators." Retrieved https://www.riaa.com/resources-learning/

Rosenblatt, B. (2016, September 29). The vinyl resurgence ends, while on-demand music reigns supreme. *Forbes*. Retrieved http://www.forbes.com/sites/billrosenblatt/2016/09/29/the-vinyl-resurgence-ends-while-on-demand-streaming-reigns-supreme/?curator=MusicREDEF#7b8946843fce

Shanley, M. & Weber, J. (2016, May 9). Spotify says growth has quickened since Apple Music's launch. *Reuters*. Retrieved http://www.reuters.com/article/us-spotify-future-idUSKCN0Y023B

Sisario, B. (2011, October 13). Rhapsody to acquire Napster in deal with Best Buy. *Media Decoder*. Retrieved http://mediadecoder.blogs.nytimes.com/2011/10/03/rhapsody-to-acquire-napster-in-deal-with-best-buy/?_r=1

Siwek, S. E. (2007). *The true cost of sound recording piracy to the U.S. economy* (Rep.). Institute for Policy Innovation Center for Technology Freedom. Policy Report 188. Retrieved https://www.riaa.com/wp-content/uploads/2016/08/MusicWatch-Music-Consumer-Profile-2015.pdf

Slager, R. (2016). *Streaming into the future: The value of music in the digital age* (Unpublished master's thesis). Universiteit Utrecht.

SNL Financial. (2016, October 10). [Graphic with stats on five major music-streaming services]. S&P Global Market Intelligence. *Top Players in Streaming Music at a Glance.*

Spotify. (n.d.). *Support*. Retrieved November 16, 2016, from https://support.spotify.com/us/

Sterne, J. (2003). *The audible past: Cultural origins of sound reproduction.* Durham: Duke University Press.

Stutz, C. (2015, December 1). Spotify tops Pandora as world's most popular music streaming app." Billboard. Retrieved http://www.billboard.com/articles/news/6784774/spotify-pandora- most-popular-music-

streaming-app-worldwide

Wlömert, N., & Papies, D. (2016). On-demand streaming services and music industry revenues — Insights from Spotify's market entry. *International Journal of Research in Marketing, 33*(2), 314-327. http://dx.doi.org/10.1016/j.ijresmar.2015.11.002

YouTube. *Press*. "Statistics." *Red*. Retrieved November 16, 2016, https://www.youtube.com/yt/press/statistics.html