IDENTIFYING THE IMPACT OF MAJOR CULTURAL EVENTS ON
GENERAL MUSIC CONSUMPTION HABITS IN THE UNITED STATES

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Identifying the Impact of Major Cultural Events on General Music Consumption Habits in the United States

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DEDICATION

I would like to thank my parents Ken and Bea, and my sister Kristin for all of their support and guidance despite all of my strange decisions throughout my life. I would like to thank my wonderful friends for all of the adventures that were undertaken, all the weekends of frivolity, and all the long evenings of music and laughter that we shared over the last two years when I probably should have been studying. I can’t wait for the next one! I would like to thank Cindi Avery for letting me embark on this ridiculous journey when I should have been working. I would like to thank Michael Sherrillo for letting me “borrow” his thesis idea. Finally, I would especially like to thank Sam Bradshaw for all of her love and for putting up with my complaining and anxiety during the course of this project.
I think I believe in myself.
ABSTRACT OF THE THESIS

Identifying the Impact of Major Cultural Events on General Music Consumption Habits in the United States
by
Kenneth T. Eng
Master of Arts in Liberal Arts & Sciences
San Diego State University, 2015

Since 2001, the United States seems to have experienced a major cultural shift in the sudden popularity of country music. Anecdotally, this was due to an increase in the sentiment and rhetoric surrounding national pride caused by a variety of events that would affect our perceptions of our cultural climate, and country music is the most commonly perceived form of expression of those ideals. In this study, I try to find correlations on whether major cultural events actually do affect the way we consume music and if certain events have changed our listening habits as a reaction to them specifically. By analyzing data collected from the Billboard Hot 100 chart and Google Trends data, I come to the surprising conclusion that no tangible relationship is found between major cultural events and music consumption despite overwhelming anecdotal evidence to the contrary and major improvements in data collection methods, and that metrics other than cultural events are much better indicators and explanations for shifts in Billboard chart movement. After coming to this conclusion, I explore the complexity and nuances of the Billboard charts and their data collection methodology, which plays a major role in how song positions are charted while also offering an explanation for the original premise of the “sudden” popularity of country music. I also examine the history of Google Trends data and present a justification for this study based on related experiments including Google Flu Trends. I present modifications for my own methodology for a potentially more nuanced analysis in order to find micro trends in chart movement as opposed to major general trends. Finally, I include a discussion on the psychology of Internet search behaviors and unique music perception, and why these are perhaps the most important factors affecting this study.
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INTRODUCTION

Immediately following the attacks on the World Trade Center towers in New York City on September 11, 2001, the United States seemed to experience a decade-long surge of increased and amplified nationalism, both in our public presentations and for many, our own individual perceptions of the country. Seemingly overnight, it became respectable to flaunt one’s own sense of patriotism, almost to a fault.

During the years that followed, the US embarked on two wars, which not only shaped international perceptions of America, but also shaped events internally. We saw the creation of the Department of Homeland Security, the use of email tappings by the NSA, and numerous other politically motivated events as direct or indirect results of 9/11, often used as justifications ensure our security and to display our national pride. At one point, segments of the country became so enthralled by the notion that we denounced unsupportive allies and renamed French fries “freedom fries”.

We also experienced a cultural phenomenon that was less discussed by the news media that might have been a result of the increased nationalistic rhetoric in the apparent rise and sustained popularity of country music. In 2012, the NPD Group (2013) conducted a survey that showed that country music was now “America’s favorite genre, mostly because of its diversity and the accessibility of its artists to young and old alike,” which appears to contradict the cultural representation of country music as overwhelmingly "red state" music. In the past fifteen years, the country music industry has gone on to produce some of the
highest-earning and most influential people in America, not just simply entertainers in the US today. It was not long until country music stars became household names and icons as they quickly found their way onto the national stage and were injected into the national conversation. Everyone from pop princesses like Taylor Swift and Miley Cyrus (both of whom started as country music singers and quickly evolved into the pop culture powerhouses they are today) to conservative tent posts like Ted Nugent, who famously took aim at current US President Barack Obama, both figuratively and literally (Johnson, 2014). Bastions of liberal ideals were infiltrated by the music of the conservative set and from that seedling, the roots of country music began to take hold and grow.

Anecdotally, one could infer that the sudden increase in country music’s popularity was somehow related to the increased sense of nationalism that was touted across major political parties, national news media, and other influential outlets like conversation threads on budding social networking and blogging websites on the Internet. As the fervent and polarizing rhetoric of these groups and individuals dramatically increased, so did the increased support for our national identity, and perhaps no other music espoused the unequivocal love of God and Country like country music. Country music is often perceived as American as apple pie, and it would seem as though the public voiced that sentiment through their voracious consumption of it.

The Rise of Google

Country music was not the only cultural force to come out of the early 00’s. The search engine giant Google found its roots in 1997 at Stanford University and was officially
incorporated in 1998, finally going public in 2004. Since its inception, Google has become ubiquitous not only in the US, but around the world, for better or worse, as the premier name in all things “search”. In May 2011, it was reported that Google’s flagship website and service Google.com was used by a staggering 1 billion unique visitors a month ("Google’s New Record,” 2011). The term “Google” itself has been recognized as the cultural *de facto* verb to define search on the Internet. Its usage statistics dwarfs usage of all the other search engines combined. The best estimation is that 71% of all web traffic is directed through Google search (Schwartz, 2014). As one of the success stories of the Dot Com explosion of the early 00’s, Google also helped usher in an era of immediacy where information is accessible anywhere at the touch of our fingertips, news stories are consumed in real-time on portable devices like iPhones and iPads, and communication between people around the world takes less than a matter of seconds.

Our newly minted, computer-driven world led to yet another cultural and industrial revolution of sorts, which was the ability to collect and analyze massive amounts of data in real-time. This new capacity has allowed industries as varied as Wall Street to automobile traffic-monitoring agencies to modify their practices instantaneously to become more efficient and effective in their work. For example, researchers at the Center for Polymer Studies, Artemis Capital Asset Management GmbH, and the Institute of Physics found clear evidence that "weekly transaction volumes of S&P 500 companies are correlated with weekly search volume of corresponding company names" (Preis, Reith, & Stanley, 2010, p. 5070). While the use of data to predict trends is obviously hardly a new phenomena, the implementation of more advanced computing, the means to analyze the data at a moment’s
notice, and the ability to communicate with traders or traffic lights on the other side of the planet is a new capability that is still being explored and capitalized upon.

**Google Flu Trends and Search-Based Correlations**

In 2009, health officials partnered with Google to launch a program called Google Flu Trends with the intention of creating an early detection system for new flu epidemics based on the rise of search queries that resemble flu-like symptoms. Previous methods of combating flu epidemics were slow and cumbersome, and often relied on reactionary responses to potential outbreaks. However, this system would theoretically allow researchers to pinpoint possible outbreaks before they became epidemics. According to researchers from Massachusetts General Hospital and Imperial College London, “Google Flu Trends uses a multitude of Web search queries that correlate well with physician visits for influenza-like symptoms to estimate current weekly levels of influenza activity at regional and state levels.” (Carneiro & Mylonakis, 2009, p. 1557) They found that,

> There is a close relationship between the number of people searching for influenza-related topics and those who have influenza symptoms... [However] all the people searching for influenza-related topics are not ill, but trends emerge when all influenza-related searches are added together. (Carneiro & Mylonakis, 2009, p. 1557).

By working with a special Google Labs development team to provide the appropriate metrics and refine search queries, researchers and medical personnel had access to real-time data to interpret, predict, and counter new flu outbreaks that were likely occurring based on search alone. The project was generally hailed as a success and researchers were able to detect influenza outbreaks “7-10 days before the traditional surveillance systems used by the CDC” (Carneiro & Mylonakis, 2009, p. 1563). The implications for the health field are staggering,
in that organizations that monitor epidemics could theoretically deploy resources almost preemptively and potentially stop a wider outbreak more efficiently. Carneiro and Mylonakis were also able to use Google’s localization detection technology to pinpoint where outbreaks occur making quarantine efforts more effective. However, in order to broaden the scope of the project, Carneiro and Mylonakis (2009) concede that more studies are needed to “find suitable web query proxies that correlate well to actual cases of diseases of interest” (p. 1563). Once this is done, these proxies “can be used to establish specialized tools for infectious diseases, using Google Flu Trends as a blueprint, or to set-up syndromic surveillance of Web search queries” (Carneiro & Mylonakis, 2009, p. 1563). Given the apparent success of Google Flu Trends, the development of these search queries and the use of their blueprint seems like more of an inevitability, meaning that in the near future, we could be seeing search engines being used as early detection devices for literally every major endemic of a conceivable and categorizable threat.

Other arenas have also implemented similar techniques to better inform their efforts. Researchers from Yahoo! Inc.’s Research Department have used real-time search data to determine if there was a correlation between search behavior and consumer habits, specifically in consumable media like film, video games, and music. According to a study by researchers Goel, Hofman, Lahaie, Pennock, and Watts, (2010)

Search-based predictions are strongly correlated with realized outcomes for movies and video games and moderately correlated for music, where in each case revenue or rank is predicted on the day immediately preceding the event of interest. Moreover, this shows that the predictive power of search persists as far out as several weeks in advance- for example, four weeks prior to a movie’s release search volume remains highly correlated with opening weekend revenue. Going beyond correlation with contemporaneous events, therefore, these results show that search can also predict the near future- a finding that may apply usefully to a wide range of consumer behaviors and economic indicators. (p. 17487)
Essentially, like Google Flu Trends, researchers are now able to predict how well consumer media will perform in the marketplace based on consumer interest as indicated by search volume in the time leading up to its release. These event-based correlations led to some interesting questions on whether the inverse of this question was proposed. While these predictors seem to suggest that use of search could draw moderate correlations to consumer habits, the proposition arose that a similar, but modified assertion could also be made. Instead of using search queries that relate specifically to the medium in question, what could be made of non-related queries that only potentially relate to a specific arena? If the power of predictive search has already been demonstrated, why not test its limits with a question that seems (at least methodically) to be feasible?

**Study Premise**

This brings us back to country music’s rise in popularity versus the increase in nationalism in the US. Could we use Google’s search query data, given the previously demonstrated popularity of the service to find direct or indirect correlations between the rise of country music with the apparent rise in national pride? With the availability of real-time data provided by Google (or in this instance, seemingly unbiased historical data), we should presumably be able to locate and identify cultural markers and trends based on general search histories for the American public that could suggest shifts in listening habits due to major national events.

Though the findings of such a study would likely only affect the music industry’s approach to marketing, the implications it might have by providing insight on how we as a
general public respond to major events is staggering. If there is a quantifiable indicator that could map how people respond to cultural events in a passive way such as listening to music (as opposed to more active methods like charitable donations, attendance at churches, volunteer work, etc. which are influenced by cultural and societal pressure to act in a specific manner), we might be able to determine how we, as a people, collectively feel about an event rather than how we should feel about an event. The presumption that we express our true natures through art and the interpretation of that art would allow us to effectively and quantifiably predict how we respond to major cultural events. Researchers posit that data mining has the potential to shed light on previously unquantifiable questions such as these in that the primary objective of data mining is to “find structure in data” (Hand, Blunt, Adams, & Kelly, 2000, p. 112). However, they argue that the “chief concerns may be whether the clustering could reasonably be attributable to chance or not” (Hand et al., 2000, p. 112). This concern will play a pivotal role in the findings of this study, which Goel et al. (2010) have already alluded to. They go on to state that “if the data set involved 100 million points, then the minute features could be detected as highly significant. It is likely, however, that many of these would be so small as to be of no conceivable value” (Hand et al., 2000, p. 114).

Based on Hand’s (2000) assertions, tracking whether country music benefited from the aftermath of the September 11, 2001 attacks is incredibly problematic. One could presume that by identifying a series of predetermined search queries that related to national pride before and after 9/11 and finding a undeniable rise in usage, while simultaneously finding a similar correlation between the popularity of country music during the same time periods would be grounds to confirm that the postulation is, in fact, true. But in order to accurately gauge the impact of major current events, we would first need to determine which
events we should study, find a comprehensive and unbiased source for identifying any trend
data, and find an unrelated data source to compare it to in order to make any kind of
speculative correlations. Due to its overwhelming popularity in the search engine market,
Google’s data should, and is, the preferred data source due to its relative availability¹ and
unbiased nature. However, for the music industry, finding a consistent and popular measure
for determines a song, artist, or genres commercial success is a more precarious endeavor.
Multiple resources exist for determining the objective commercial success of a song, yet each
has their drawbacks in methodology.² The most widely cited source of this information exists
in the form of the Billboard Hot 100 chart, which has been collecting data on popular music
in American since 1894 and based on those grounds, this will be our second source of data
(Godfrey, 1998, p. 45).

Theoretically, by combining the data collected by Google on search trends compared
to the chart performance of songs should yield some insight on whether or not people’s
preference in music is influenced at all by major cultural events in the US. The studies
discussed previously have already shown the potential predictive power of search on the
performance of a type of media, such as film, video games, and music. The following chart
from Goel et al. (2010) shows a clear correlation between search and both film and video
games, however the correlation between music is less defined.

¹ The availability of Google’s data will be discussed later.
² The methodology of music data collection will be discussed later.
Figure 1. Correlation between search volumes and date of media release (Goel et al., 2010)

The opportunity here is to find a more definitive correlation between the effects of major events as dictated by search and the performance of songs, as they relate to that event.

**Data Source Discussion**

As noted above, the main source of data for this study comes from Google, which is currently the most widely used search platform in the US. However, in order to produce any kind of viable results for our premise, we must consider the type of data that would reasonably yield productive results, as well as a data set that is readily available for analysis. One solution to this problem is the Google Zeitgeist/Google Trends lists produced by Google to show top-level trend information as a sort of cultural touchstone. The Google Zeitgeist/Google Trends project was officially launched in 2004 (which was part of the rationale why conducting the explicit "country music versus nationalism" study would not
have yielded sufficient results, as the data is not readily available\(^3\), initially as way to display a “unique perspective on the year’s major events and trends.” (Google Press Center, n.d.)

Since then, it has transformed into a more granular project that can segment search trends by year, month, country of search origin, categories such as “most popular people,” “most popular performer,” “most popular news stories,” etc. that seem to rotate depending on the level of influence and the number of searches in that category for that particular year. For example, because of the 2008 Presidential Race and Election, Google Trends displayed categories related to this topic as it was a major search trend for the year, whereas in 2009, the election cycle was less of a trend and was therefore left off of the top trends list. An archival list of all the Google Zeitgeist/Google Trends webpages and search trends is available to the public at google.com/trends, though admittedly some of the sites are obviously dated.

\(^3\) Further research can be done in this field, but for our purposes, we will use predictive search in an alternate capacity.
Google Trends, as it was renamed in 2007, now hosts a variety of topics of interest in Google’s analysis of the year in search. Aside from the multitude of search categories that have become as specific as “Calorie Searches”, which lists the foods people were most interested in the amount of calories in that specific food item, and the most searched whiskey in the US, the company has also shared which searches were the most popular aggregated search topics throughout the year. Though the exact figures are not made publicly available, simply browsing through the past five years shows interesting trends in how people have actually used the search function.4

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4 The author believes this topic should be a subject for further research and discussion.
As noted earlier, *Billboard Magazine* (or simply *Billboard*) has been collecting data on the general public’s music consumption since 1894. *Billboard* began as a trade magazine for billboard advertisements, which slowly transformed into an entertainment industry-based magazine hosting ads for carnivals, travelling circuses, vaudeville performances, etc. In 1913, the magazine began publishing the sales rates for sheet music for vaudeville performances and top songs in vaudeville theaters (G N, 2011). In 1961, the magazine was re-tooled specifically for the music industry and began publishing its flagship chart, which later evolved into the *Billboard* Hot 100 and lists the most popular songs in the country based on a series of pre-determined metrics including sales figures from select record stores and radio airplay. After 1991, the chart information for the weekly Top 100 songs was based on a national sample of retail-store sales reports collected, compiled, and provided by the company *Nielsen SoundScan*, along with other important metrics that will be discussed later (Bhattacharjee, Gopal, Lertwachara, Marsden, & Telang, 2007, p. 1360). *SoundScan* ushered in an era of real-time information on sales and inventory levels. With the new, more sensitive measure, it was easier for record label executives, artists, promoters, and retailers not only to track sales, but also to correlate chart position movement with industry news-making events involving artists, which was not unlike Google Flu Trend data, but predating Google by about a decade (Gubernick, 1993, p. 67).

However, at the turn of the century, the reliability of this data was called into question due to the rise of online file-sharing, digital media downloads, bootleg copies of CD’s, etc.

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5 Discrepancies of data collection methodologies by *Billboard* are discussed further in the “Issues” portion of this research.
As Bhattacharjee et al. (2007) aptly state, “the first reported decline in music shipments occurred in 2001, suggesting the possibility that the influence of these events [file-sharing] was beginning to be experienced by the music industry” (p. 1360). In 2005, downloaded music had become so pervasive due to the introduction of online music stores like iTunes in 2003, that Billboard began accounting for digital sales in the chart rankings instead of limiting the charts to SoundScan’s point-of-sale methodology. In 2007 and 2013 respectively, Internet radio streaming services like Yahoo! radio, AOL radio, etc. and on-demand streaming services like Pandora, Spotify, etc. were incorporated, again, due to the rising prominence of the media formats. To further illustrate this shift, the song “Boulevard of Broken Dreams” by the American punk band Green Day, which topped the newly created Hot Digital Chart in 2005, sold 30,000 units online. By comparison ten years later, the current song on top of the Hot Digital Chart is “Uptown Funk” by music producer Mark Ronson featuring pop singer Bruno Mars, which has sold 319,000 units as of the writing of this piece (Trust, 2015).

Of course the difficulty with data sources like Google and Billboard who have detailed records of items that span over decades (particularly their flagship services, which are Google search and the Hot 100, respectively), lies in the problem of how to analyze it. But before that discussion, it is prudent to explain where the primary source of the raw data is derived. As noted earlier, Billboard currently uses the Nielsen SoundScan system developed by Mike Fine and Mike Shalett to track the data. However, the process in which this data collected is not simply a raw number from every music distributor/sales outlet in the country, as the logistics of organizing and analyzing data such a system would be highly cumbersome and inefficient.
Beginning in 1991, *SoundScan* started using the point-of-sale methodology as discussed earlier, which was combined with information from the Top 40 Radio Monitor, an airplay chart whose data is also mechanically collected and tabulated. The Top 40 Radio Monitor ranks pop singles in order of "gross impressions" by a company called Broadcast Data Systems, which electronically monitors 118 Top 40 radio stations 24 hours a day, every day. The "gross impressions" are calculated by cross-referencing the exact number of radio rotations with listener information supplied by Arbitron (Holden, 1991). The same method of using select vendors like iTunes, Spotify, YouTube, etc. was introduced in the early 2010’s to continue with the methodology of collecting impression estimates, again as noted earlier. For all intents and purposes, this is how *Billboard* determines how songs rank on their weekly charts. Essentially, the chart rank is an estimate of how well a song has done in the past evaluation cycle based on a pre-determined sample size by *Billboard/SoundScan*.

However, the data that *SoundScan* collects for *Billboard* is, and will continue to be, proprietary information. You can purchase the raw data from *Billboard* for a menial fee of $1,000 for each year of data someone wishes to review or you can glean the data manually from their published charts. Thankfully, an alternative was discovered in the form of the Whitburn Project. The Whitburn Project is a collective of music historians that is carefully monitoring and cataloging the *Billboard* Hot 100 for scholastic use. The volunteers at the Whitburn Project have created a spreadsheet of 37,000 songs and 112 columns of raw data, including each song's duration, beats-per-minute, songwriters, label, and week-by-week chart
position for the Hot 100 chart and continue to be updated weekly (Baio, 2008).

![Sample Whitburn Project Chart](image)

**Figure 3. Sample Whitburn Project Chart** (Whitburn Project, 2011)

Once this raw data was obtained, it was simply a matter of methodology in analyzing the data. In a few instances, trends such as average song lengths over time have been already been gleaned from the Whitburn Project.
Figure 4. Average song duration over time (Baio, 2008)

It should also be noted that the schedule *Billboard* uses to publish their charts is less-than-intuitive to those not intricately involved in the process.\(^6\) While the analysis and publication of the data may be next to immediate, the submission of this data is clearly not. Sales, airplay counts, and impressions are all collected over the course of weeks, which are reported to *SoundScan* every following Tuesday and made available to *SoundScan* subscribers two days later on Thursday. This seems to explain potential variations in inconsistent event date correlations in the collected data that will be discussed later. This essentially means that the *Billboard* chart will begin to show influence from external events

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\(^6\) See the previous discussion for the full explanation on how *Billboard* chart information is obtained.
up to three weeks following the event, due to their collection processes and publishing
timeline. For example, this is a hypothetical week of collection and distribution dates for

*SoundScan* data:

1. Monday, January 1 – sales tracking-week begins
2. Wednesday, January 3 – airplay tracking-week begins
3. Sunday, January 7 – sales tracking-week ends
4. Tuesday, January 9 – airplay tracking-week ends
5. Thursday, January 11 – new chart released, with issue date of Saturday, January 20.

It will be important to keep this system in mind once we begin correlating event dates to chart movement.

As for the Google data sets, again, the raw data is not publicly available. However, again, a viable alternative was found. On the Google Trends website, users have the capability to review trends based on year-end, and even month-specific search trends in the form of Top 10 lists, which is publicly available. A total of 172 Top 10 Search Trends were identified from 2004-2014 in the major yearly retrospectives. The rationale behind using year-end data instead of individual months was simply due to the fact that over 75% of the Top 10 year-end trends were the same as month-specific trends. For example, in 2012, pop artist Justin Bieber ranked in the top 10 search trends for every month 2012. This is predominantly true for nearly every other major news story and search trend of note in every category, with no notable exceptions except for those categories that are granularly specific like “Top Zagat Rated Restaurants- San Francisco, CA.” Additionally, the top year-end searches represent the aggregate total number of searches for the entire year. Even events that

7 These lists often make their own news stories in the form of yearly retrospectives in late-December.
were limited in time frame to a few days appear on these lists such as the death of Whitney Houston in 2012. Since the sheer volume of the searches in the days following the pop singer’s death totaled more than searches for other topics, this was also an effective measure to determine truly influential moments in history by year. For all intents and purposes of this project, the Top 10 year-end lists represented every major news story that could conceivably affect American culture in such profound ways such as listening habits of the general public.

One of the other major considerations for this project was whether to limit the timeframe of the project or to leave it as open as possible. This essentially meant that we would need to decide whether to study the entire scope of the data sets that were available or to limit the scope to a certain decade or a certain year. At the outset of the project, the intention was to study the entire scope of the data, being 2004-2014, as the Google Trend data does not extend beyond 2004 in a meaningful way. However, as the data sets were collected, it became evident that the feasibility of conducting this research would be problematic. In the span of 2004-2014, over 4,400 individual songs have charted on the Hot 100 chart, each with individual position rankings (1-100) that correspond to the unique week(s) that the song spent on the chart according to the Whitburn Project. This would yield over hundreds of thousands individual data points to analyze.

The suggestion was made to focus the research on one year as a case study to determine if any trends emerged at all. If any viable trends were established in a sample year,

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8 There is Google Trend data that extends to 2001 however, this data set is not disclosed as a Top 10 list, but rather “trending searches”, which could imply that these searches were not the most searched terms or phrases, but rather searches that were more popular in a particular year versus the previous year.
that would merit further study to show a broader trend across years and decades. The second major consideration that was needed was to determine which year would be a varied and viable sample for this case study? The early years of the Google Zeitgeist project were not chosen because the level of search complexity is markedly different between 2004 and today. Also, according to the Pew Research Center in 2004, Americans were still consuming major news media primarily via television sets, as opposed to the Internet, which is our primary data source.

![Trend in Regular News Consumption: Television Sources](image)

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*Figure 5. Pew Research Survey on the Method of News Consumption from 1993-2004 ("Where Americans Go for News," 2004)*
The introduction of Twitter as a real-time information feed in 2006 changed this, however some would argue that the actual boom in Twitter usage occurred in 2009 when actor Ashton Kutcher and Twitter CEO Evan Williams sat down with media mogul Oprah Winfrey on her talk show and demonstrated the potential of the social media network (Ostrow, 2009). This along with the popularity of smartphones and the increased reliance on the Internet for news helped narrow the field to post-2010. The year 2012 was chosen because it demonstrated a diversity of national events in the US from historical events like the 2012 Presidential election and the 2012 Olympic Games in London, to cultural events like the Trayvon Martin shooting in Florida and the release of the Joseph Kony documentary, to directly entertainment-related events like the death of Whitney Houston and the sudden popularity of pop sensation Carly Rae Jepsen’s song “Call Me Maybe”. By using 2012 as the sample year, we are still left with 428 individual songs and over 7,000 individual data points from Billboard, as well as 60 Google Trends events deemed to be major cultural moments. It was agreed that this would be an adequate sample size to draw correlations and trend data.
METHODOLOGY

For this project, the *Billboard/SoundScan* chart data, particularly the “Date Entered” and the “Date Peaked” data points, were of particular interest. These would indicate when a song enters and peaks on the Hot 100 chart and might be considered clear indicators that a particular event around that time period caused this sudden surge in popularity. Songs that also experienced chart jumps by over 20 spots over the span of one week were also of interest. There is no clear average for average chart position changes due to the multitude of issues that might affect this type of analysis. However, based on the Billboard chart’s position movement record holders for upward and downward movements such as the 96 position jump up by pop singer Kelly Clarkson’s “My Life Would Suck Without You” and 79 drop down by soul singer Javier Colon’s “Stitch by Stitch” (coincidentally, Clarkson and Colon were the season one winners of American Idol and The Voice, respectively), jumps of 20 should be significant enough to consider (“List of Billboard Hot 100 Chart Achievements and Milestones,” n.d.). In 2012, there were fewer than 30 songs that had position jumps of over 20 spots.

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9 It is important to remember that potentially thousands of songs were not included on the charts in 2012, which is more of an indication that the popularity of a song did not reach the level of the Top 100 charts. Seeing a song reach that level is cause enough to attempt to explain why the appearance on the chart was possible, thus the importance of the “Date Entered” field.
It is important to also reiterate that not all songs reach the top of the charts, nor do many songs have a particularly extensive shelf life. In many instances, songs achieved a chart ranking on the low end of the chart (below 80) for a total of one week. In 2012, 92 out of 428 songs charted for only one week. The number of times an artist made it on to the chart, due to a variety of reasons, whether that was because of an album release, major cultural event, featured appearance on another song, etc. was also taken into account. The top five songs based on popularity as determined by peak position, the duration of their chart appearance, etc. was another metric of interest. Finally, song genre comparisons were also made simply out of respect to the initial analogy of country music versus nationalism.

Collecting major event data was also a difficult process as many of these considerations were based on a song’s enter date, peak date, or unusual movement. Once a song or artist was identified as a data point of note, their activity during 2012 was researched and notable moments in their careers and public lives were taken into account. These events were collected over a variety of sources including traditional news outlets (CNN, NBC News, PBS, etc.), non-traditional news outlets (entertainment websites, tabloid magazines, Wikipedia, etc.), and in some instances, social media networks. These were then referenced back to the date/dates in question to find reasonable connections to explain the song placement in question. To adjust for possible variations in this methodology, the search date from the given event was expanded to two weeks before and after to show perceivable and explainable movement. As noted before “the predictive power of search persists as far out as several weeks in advance” (Goel et al., 2010, p. 17487) and given Billboard's chart publication schedule, this should account for any variations in dates.
RESULTS

Celebrity Deaths

Over the course of the analysis period, the Whitburn Charts were carefully analyzed to mark obvious and unique events in the chart makeup. In some instances these were fairly easy to detect. The most easily identifiable example of this was the weeks following the death of legendary pop singer Whitney Houston on Saturday, February 11, 2012, who is widely considered one of the best vocalists in popular music ever. (“Whitney Houston - 100 Greatest Singers,” n.d.) Because of the unexpected nature of Houston’s death, the news media quickly picked up on the story and her music immediately became one of the primary outlets fans used to express their grief. In fact, each of the major news networks halted their originally scheduled broadcasts to cover Houston’s death, deeming it a important news story in its own right. Due to the nature of Houston’s death and the intense media coverage following the announcement, the event became a national trending topic, according to Google. To illustrate this point, according to the Whitburn charts, reissues of four of Houston’s songs, “I Will Always Love You,” “I Wanna Dance with Somebody,” “Greatest Love of All,” and “How Will I Know” re-entered the chart on the next publish date of February 25, 2012. The only exception is “How Will I Know,” which re-entered the chart two weeks following Houston’s death. The three Houston songs that entered directly following her death are arguably her most beloved and universally recognized songs with each song reaching the number one position for the top three most number of weeks, 14, 3,
and 2, respectively and had not been seen on the chart since 1993. Each of the initial three songs entered the charts at number 7, 35, and 41, and rose to 3, 25, and 36 for the March 3 chart, the following week, which coincides with the date of the funeral on Saturday, February 18, 2012. Interestingly, the song “How Will I Know”, Houston’s second number one song also re-entered the charts for the week of March 3 and remained only for that week. “How Will I Know” is notable specifically because of the music video produced for the song benefited from heavy rotation on MTV in 1988-1989, which was first for Houston (and signaled a shift in the network's programming efforts for minority performers).

Whitney Houston was not the only major musician/entertainer who died in 2012. The death of the “Queen of Disco” Donna Summer on Thursday May 17, 2012 was also a major news trend in 2012. However, unlike Houston, Summer’s music did not re-enter the chart at all in 2012. In fact, Summer had not had a song reach the charts since her song “I Will Go with You (Con Te Partiro)” in July 1999. It is also important to note that Summer’s death, unlike Houston’s was not sudden. Summer had been diagnosed with lung cancer and was at the age of 63. (Pareles, 2012) Houston, on the other hand, was believed to have accidentally drowned from a possible overdose of cocaine at the age of 48.

As morbid as these details may be, they do shed possible insight into how people process celebrity deaths and how that affects our moods. According to a study from Kansas State University (2012),

10 Note: Events that occur on Saturdays will not have data reflected until the next chart cycle, which explains the gap in time between the date of Houston’s death (February 11, 2012) and the entry of her songs in the Billboard chart (February 25, 2012). Please see the previous discussion on data for a more detail explanation of this event’s date inconsistencies.
people develop relationships with media characters in a similar manner to how they do so in real life… ‘We don't have the social structures and support for grieving the loss of a media character’…As a result, social media postings can turn therapeutic for some devoted fans or supporters.

Music has been a large part of grief therapy for its connection to an emotion, its ability to create and develop community with other grievers, and its ability to pay tribute (Albergato-Muterspaw, 2009). When the death is relatively unexpected like Houston’s, these effects can be more pronounced.

Another major factor that might have influenced Houston’s return to the charts as opposed to Summer’s is that the general age of Houston’s fans compared to Summer’s would have exacerbated the sharing of media stories, memories, and media through social media, making consumption of Houston’s music a much more public activity. A final major factor that might contribute to the unexpectedness of Houston’s death was the public nature of the decline of her career and public persona. Leading up to her final years, Houston was faced with public accusations of drug use, a negatively received reality show starring her daughter and husband R&B singer Bobby Brown (who was accused of domestic abuse), and eventually a very public divorce. Throughout these personal struggles, fans were hopeful for Houston’s rehabilitation and success, and ultimately stunned by the tragic nature of her untimely death. What this suggests about our modern listening habits when they surround the untimely death of an influential music (Whitney Houston, Michael Jackson, etc.) is that we channel our grief through their music as a way of expressing our grief, finding community in our expression, and paying tribute to the figure we have lost. This easily correlates with the sudden re-entry of Houston’s songs, as many found solace and comfort in paying tribute to Houston through her music.
No other meaningful correlations were found in relation to the date of Houston’s death.

**Major Performances during Major Televised Events**

One of the classic forms of music promotion has historically been through performances by musicians during major televised events, which is obviously not a new trend. Researchers from London Business School and Vanderbilt University found that the effect of a well-received performance on the national stage was almost always a surefire way to make significant gains in sales and chart positions on *Billboard*.

Record industry executives, retailers, and artists assumed that a record gradually finds its audience before reaching the top end of the charts, whereas SoundScan data revealed that generally an album sells strongest in the weeks just following its release. Previously, the myth was that a record had to “pay its dues” in terms of being initially “plugged” at the right time and in the right places before it could build up the momentum to chart nationally… Examples of such events include an appearance on national television, the winning of a Grammy or other coveted award, a focused targeted promotional campaign, or significant personal events in the artists’ lives. Construction of belief structures around presumed causal relationships between chart position movements and news-making events soon became routine in the trade press. (Anand & Peterson, 2000, p. 280)

According to Google Trends (Google Press Center, n.d.), the most significant American televised event from 2012 was Super Bowl 46, which took place on Sunday, February 5, 2012 at Lucas Oil Stadium in Indianapolis, IN. The broadcast drew an estimated viewership of more than 110 million people in the US alone. Performances were as follows:

1. Country singers Blake Shelton and Miranda Lambert- America the Beautiful
2. Pop singer Kelly Clarkson- The United States National Anthem
3. Pop singer Madonna with special guests rapper/singers Nicki Minaj and M.I.A. featuring rap duo LMFAO and rapper/singer CeeLo Green- Halftime performance
The effect of having an audience of almost a third of the country's total population is not one that can be easily ignored. For each performer during Super Bowl 46, a noticeable increase in performance was shown in the weeks following the performance with the exceptions of CeeLo Green and M.I.A. For Blake Shelton, his single “Drink On It” entered the February 12 charts immediately following his Super Bowl performance at number 81, despite the song being officially released on January 9, 2012. Shelton’s wife and duet partner for this performance Miranda Lambert also enjoyed a bump in the performance of her song, “Over You,” which initially entered the charts on November 19, 2011 but did not re-enter the charts until February 12 at number 87. Pop singer Kelly Clarkson’s song “Stronger” reached the number one spot on the February 12 chart following her performance of the National Anthem and topped the chart for three weeks. The “Queen of Pop” Madonna’s then-single “Give Me All Your Luvin’” entered the charts on February 19 despite being officially released on February 3 at number 13, leading up to her historic performance. Collaborators LMFAO enjoyed bumps in their singles, “Sexy and I Know It” in the form of a five spot jump from number nine to number four, and the entrance of their latest (and last before the duo’s indefinite hiatus) single “Sorry for Party Rocking” at number 92, despite being released on January 17, 2012. Nicki Minaj, who is a featured performer on Madonna’s “Give Me All

11 Madonna’s Super Bowl performance broke Michael Jackson’s record for highest viewership in Super Bowl history, which was coincidentally also more than the actual game at 114 million viewers.

12 “Sexy and I Know It” was also covered on the hit television show Glee on February 7, 2012, which may have also contributed to the rise from number nine to number four. This will be discussed later.
Your Luvin’’, quickly released the single “Starships” on Tuesday, February 14, 2012 and entered the March 3 chart at number nine.\(^{13}\)

Curiously, CeeLo Green did not enjoy a bump in performance. This could be due to a multitude of factors including the fact that Green did not have any new material to promote since the release of his 2011 album *Ladykiller*, which had already enjoyed sizable chart time. Also, CeeLo was the only artist during the Halftime show that did not have any of his own original music showcased, as his performance and screen time was limited to a duet with Madonna on her songs “Open Your Heart” and “Express Yourself”. Incidentally, M.I.A. also did not receive any boosts in her performance on the charts, again because she did not have any material to promote, but also likely because of the controversy she garnered when she used an explicit hand gesture during her portion of the performance. Aside from the sensationalism of the acrobatics during the performance, this was the only element of note during the entire performance that drew any major critique.

Performances like these on a national level seem to imply that barring any controversy or criticism, the general public will likely respond positively to a well-received performance, as noted by increases in sales and airplay. We see this most evidently in Kelly Clarkson’s “Stronger,” which despite being on the charts 15 weeks earlier, returned to become one of Clarkson’s most identifiable and highest charting songs in her catalog. However, other factors such as major marketing campaigns begin to emerge around the release times and success of songs. Six out of the eight performers in the Halftime show had

\(^{13}\) “Starships” is currently Nicki Minaj’s most successful song, to date.
songs that had been released weeks before the performance in order to capitalize on the increased publicity, and sometimes days after (such as Nicki Minaj).

Unfortunately, this example tells us little-to-nothing new about how the general public responds to these types of events since numerous studies have already been done on the effect televised events have on chart and sales performance for entertainers. In the case of the Super Bowl Halftime show, it has become more of a guaranteed launching point for marketing efforts for other projects, so much so that performers are no longer financially compensated by Halftime show organizers or sponsored, but rather “play for the exposure”. There has even been speculation recently that artists will have to pay to perform at the Halftime show, as the compensation they receive in publicity and boosts in sales performances more than compensates for the lack of outright payment. In the case of Madonna’s single "Give Me All Your Luvin'", it sold 115,000 digital downloads while her catalog of older albums saw a 410% surge in sales going from 5,000 to 26,000 copies, according to Nielsen SoundScan (Caulfield, 2015).

Other examples of major televised events were the 2012 Summer Olympics in London, England and the 2012 Presidential Debates between President Barack Obama and Mitt Romney. Though both events might cause a rise in nationalistic songs, neither of these events showed significant impact on the Billboard charts for more general trends. The chart make-up during both of these events remained statistically similar to the overall makeup of the 2012 chart with about 19% country music, 5% electronic music, 19% pop music, 8% R&B music, 26% rap music, 15% rock music, and 8% soundtrack songs. The only song that benefited significantly from either event was pop singer Phillip Phillips’ coronation anthem from American Idol season 11, “Home”. The song, which debuted at number 10 on June 9,
2012, dropped off the charts after three weeks. On the July 28 charts, the song re-entered the charts and remained there for another 36 weeks. The reasoning behind this is likely because NBC, the official broadcast network for the 2012 Olympic Games played the song heavily during its Olympic coverage, which had an audience of nearly 220 million American viewers (Etkin, 2012; G. Smith, 2015). A case could be made that pop singer Carly Rae Jepsen’s hit also benefited from a viral video made by the 2012 US Olympic Swim Team. However, analysis of the Billboard chart shows that “Call Me Maybe” was already a number one hit by the time the video went viral. It is likely that the creation of the video was more of a response to the popularity of the song.

Reality Shows and Situational Comedies

Apart from mammoth televised events that draw millions of viewers for single outings like the Super Bowl or special events like the Olympics, reality talent competitions and television sitcoms have shown themselves to be major players in the success of songs on the Billboard chart. In 2012, American Idol season 11 ran through January 18 - May 23, 2012, as well as seasons two and three of The Voice from February 5 - May 8, 2012 and September 10 - December 18, 2012. The X-Factor season 2 also broadcast from September 12 - December 20, 2012 but none of The X-Factor singing contestants made an impact on the Billboard charts in 2012. A total of 16 songs released as singles during season two and three of The Voice reached the Billboard Hot 100 chart, which accounts for about 5% of the total number of songs in the 2012 chart. This is most likely due to the fact that The Voice had a
total viewership of 275 million and 377 million people between Seasons 2 and 3, respectively. However, despite the popularity of the show, songs that did manage to chart on the *Billboard* chart were short lived, with all but one song (“Over You” by season three winner Cassadee Pope) lasting only one week each, with Pope's lasting two weeks. It is curious to note that despite the past success of *American Idol* and many of their contest winners (and contestants who reached the top 10), only one song charted from the *American Idol* season 11 contestants, “Home” by Phillip Phillips, which was mentioned earlier as having enjoyed a massive boost in popularity following its continual usage during the 2012 Summer Olympics in London. “Home” would eventually reach number six on the *Billboard* charts and remain on the charts for 40 weeks, a full 19 positions higher and 38 weeks longer than the highest charting song from any contestant from *The Voice* in 2012, Cassadee Pope’s “Over You,” which peaked at number 25.

What this shows us about the effect reality television has on listening habits is that the exposure of songs through major television competitions that draw millions of viewers for every episode like *The Voice*, though incredibly helpful by way of promotion, does not necessarily guarantee a prolonged shelf-life on the *Billboard* charts. In fact, of the 17 songs that charted on *Billboard* during 2012 that originated on a reality television show, only one song can be considered an original composition, which was Phillips’ “Home”. Every other song was a cover version of an already-popular song, suggesting that while reproductions

14 This song is coincidentally the same song written and performed by Miranda Lambert, which enjoyed a popularity boost after her Super Bowl 46 performance with her husband Blake Shelton. The song was also written by Lambert and Shelton. Pope was a member of Team Blake on season 3 of *The Voice*. 

may be temporarily popular, longevity might be better achieved in more original compositions.

This argument becomes much more apparent when we consider the next major player in television and music popularity: Glee. The popular TV sitcom ended its third season and began its fourth season in 2012 and drew almost 150 million viewers between the 22 episodes aired during the year. In that time, 26 songs from Glee appeared on the Billboard chart. As of 2013, the Glee cast has charted over 200 Top 100 singles, the most by any artist ever, though it should be noted that like The Voice phenomena, many of these songs/singles failed to chart for longer than one week (Trust, 2013). Glee also holds the distinction in 2012 for charting the most songs out of any single artist or group on the chart for that year, besting the runner up Taylor Swift who also released her album Red in 2012 and appeared on the chart a total of 12 times (including one song as a featured artist).15 Glee’s presence on the 2012 Billboard chart accounts for 7% of all songs that charted that year, which is more songs than Electronic music and Latin music combined.

Like the reality TV shows, the success of Glee does not tell us much about any new effect Glee has had on listening habits of Americans other than implying again that increased audience exposure can yield successful results, albeit fleeting ones, and perhaps that a cappella music is more palatable than was previously believed. That being said, the impact of Glee might also have also contributed to LMFAO’s rise to number five on March 3 following their performance of the song “Sexy and I Know It” on Tuesday, February 7, 2012. However,

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15 For reference, the runner up for most charted songs on the Billboard Top 40 is Elvis Presley with 80 songs, compared to Glee’s 204 songs, as of 2013 (Trust, 2013).
it is more likely that the reason for LMFAO’s rise was due to a combination of both the \textit{Glee} performance and their performance with Madonna during the Super Bowl 46 Halftime show.

The overwhelming evidence that television is reproducing and repurposing previously popular songs does not actually lend any new insight to this study, but might actually detract from it due to the overpowering majority of its presence on the charts. The fact that the combination of \textit{Glee} and reality talent competitions charted 10\% of all the songs on the 2012 \textit{Billboard} chart only suggests that exposure to large audiences can produce substantial changes to the chart. They generally say nothing about the actual attitude we take towards the music other than appeal and a few trend makers can artificially generate popularity of songs for a short period of time. Additional research that would remove cover versions or specifically target them in this instance might be more appropriate in adequately gauging the impact of television on the \textit{Billboard} charts, though we would also recommend caution as cover versions of songs have been incredibly successful indicators of a specific type of reaction to an event, such as in the instance of Whitney Houston’s “I Will Always Love You,” which was originally performed by Dolly Parton and “Greatest Love of All” which was originally performed by jazz guitarist George Benson.

\textbf{The Power of YouTube}

In the Whitburn Project data, there were some clear outliers that must be addressed simply due to their overwhelming presence on the \textit{Billboard} chart during 2012. These songs include pop singer Carly Rae Jepsen’s breakthrough hit “Call Me Maybe,” Australian indie-folk singer Goyte’s hit song “Somebody that I Used to Know” featuring Kimbra, the breakthrough hit from American folk-rock artists The Lumineers’ “Ho Hey”, and others. Carly Rae Jepsen and “Call Me Maybe” has the distinction of being number one on the Hot
100 chart of 2012 for the longest period of time at nine consecutive weeks and appeared on the Hot 100 charts for a total of 50 weeks. Carly Rae Jepsen also was one of Google Trends' most searched people for 2012. The song entered the charts on March 10, 2012 and peaked on June 23, 2012 despite being released in September 20, 2011, over six months before the song entered the chart. The time between the song's release date and its first appearance on the chart was 24 weeks. The best explanation of this sudden shift in popularity can be easily attributed to a viral video made by pop singer Justin Bieber along with then-girlfriend, singer and actress Selena Gomez (and friends) on Saturday, February 18, 2012, which features the stars lip-syncing to the song while dancing in a home in Canada (Lau, 2012).

Figure 6. Justin Bieber and Selena Gomez’ viral video of Carly Rae Jepsen’s “Call Me Maybe” (CarlosPenaTV, 2012)

The video has over 70 million views on YouTube.
English singer Ellie Goulding’s song “Lights” also follows this pattern of a YouTube-assisted boom in success bringing renewed popularity to the song, which resulted in having the distinction of being on the chart for the third-longest time period to incorporate 2012 at 56 weeks. On May 23, 2011, the song was released as a single for Goulding’s forthcoming album, “Bright Lights” and the song finally charted on August 20, 2011 but disappeared from the charts for another 21 weeks. On Friday, January 20, 2012, Goulding released a sparse music video for the song featuring the singer dancing in a dark room accompanied by various lighting effects. The song appeared on the charts again on January 25, eventually reaching its peak position of number two nearly a full year after the song debuted on the chart.

![Ellie Goulding - Lights](EllieGouldingVEVO, 2011)

Currently, the music video has over 95 million views on YouTube.
Australian singer Gotye experienced a similar boost after a series of music videos featuring his song "Somebody that I Used to Know" (featuring Kiwi singer Kimbra) went viral on YouTube in early 2012. The song, which was released on July 5, 2011, did not debut on the Hot 100 chart until January 21, 2012. In early 2012, two major viral videos surfaced helping the song gain much more attention, one of which was Google Trends' top searched video for 2012 by Canadian rock band, Walk Off the Earth. The first version featured all five members of the band performing the song simultaneously on one guitar.

Figure 8. Walk Off the Earth’s viral video of Goyte’s “Somebody that I Used to Know” (Walk off the Earth, 2012)

The quality and novelty of the video helped it to go viral almost immediately. As of 2015, that video has over 164 million views on YouTube. Additionally, the a cappella group Pentatonix, who were fresh off of their win on the reality television a cappella competition
The Sing-Off: also recorded an a cappella version of the song and released it on February 6, 2012 on YouTube.

Figure 9. Pentatonix’ viral video of Goyte’s “Somebody that I Used to Know” (PTXofficial, 2012)

The Pentatonix video has over 36 million views. The official music video, which is noted for its distinct style featuring both Gotye and Kimbra fully nude with stop motion body paint being applied to their bodies and faces also became a viral sensation, though it is likely that the official video did more to contribute to the continued success of the song, rather than helping the song to gain its initial popularity. The official music video was also released on July 30, 2011, six months before the song entered the Billboard charts.
As of 2015, the official video has over half a billion views on YouTube, making it one of the most watched YouTube videos ever. In February of 2012, Gotye began appearing on several prominent television programs including *Jimmy Kimmel Live!* on February 1, 2012 and the American sketch comedy show *Saturday Night Live* on April 14, 2012. The song’s rise also prompted other notable outlets to perform the song, including *Glee* on April 10, 2012 and *American Idol* on April 11, 2012. The song reached number one on April 28, 2012, likely as a result of all of the focused attention on the song (Trust, 2012).

Coincidentally, the song that lasted longest on the charts in 2012 (62 weeks), The Lumineers’ “Ho Hey,” shows no signs of having been affected by any major external events. It is a classic “sleeper hit”, or a song that slowly rises to popularity almost completely organically, which incidentally are much more rare.
These trends are perhaps the best illustrations of the effect of viral marketing/videos on music performance. Of the best performing songs in 2012 based on the chart position, duration of stay at the top position, and duration of stay on the chart, three of the five benefited directly from viral videos. A study on viral videos suggest that there are certain key elements to producing viral videos, including elements like “surprise,” “irony,” and “laughter,” as well as more practical pieces like video length and title length (Ayyar, 2014). However, the true nature of the viral video is not one that is easily replicable and remains the proverbial “lightning in a bottle.” What this actually suggests in terms of music listening preferences is, again, inconclusive. What we see in each example of the "viral hit" is an overwhelming amount of exposure for a given song through social media and traditional news outlets commenting on a song's virality, which can contributes to its success. Though these songs registered as cultural events in their own right as determined by Google Trends, because they are so closely related to music and the music industry, they offer little insight as to the stimulus that drives our listening preferences.

**Other Major News Stories in 2012**

After an extensive study of music-related events, it became necessary to dive deeper into non-music specific events. According to the Google Trends data, almost half of the major news stories from 2012 were completely non-music related. These stories included the rise of the video game Minecraft, news coverage about the “Stop Online Piracy Act (SOPA)”, the release of the Joseph Kony/Invisible Children documentary and the subsequent #kony2012 campaign, etc. In each of these instances, none of the events affected any perceivable change in the behavior of the Billboard music chart. In some instances like the Mars Curiosity rover landing or the stratosphere jump by Felix Baumgartner, one might
presume that these events like these that have captured the imagination and interest of
Americans might inspire some tangible, space-related listening, though finding a single song
popular enough to represent this across the general population would be incredibly
problematic. Though this might be marginally true on more specific subsets of charts such as
the digital downloads or electronic music Top 100, on the broadest level, there is no evidence
support any claim that would tie any event that was not directly music-related to a shift in
listening preferences. Events that were even loosely related such as the release of the iPad 3
and the announcement of Google Glass showed no correlation with any kind of reasonable
bump in electronic music, or futurist-themed music, or even artists who were featured in
either Apple or Google’s marketing campaigns. Even going as far as to categorize news
stories generally by mood such as happy news, sad news, inspiring news, etc. yielded no
results. While it would be potentially convenient to say that the landing of Hurricane Sandy
in the North East during the end of October, 2012 was responsible for the sudden entrance of
five Taylor Swift songs to the chart on November 10, 2012, the more plausible and realistic
reason for this upswing was the release and marketing efforts surrounding Swift’s album
“Red” on October 22, 2012.
CONCLUSION

In short, no reasonable or observable correlation was found between the listening habits of Americans and the occurrence of major national events. The only notable exception was an indirect effect on the performance of a single song that was not directly tied to the event in question, which was Phillip Phillips’ *American Idol* coronation song, “Home”. As discussed previously, Phillips’ song benefited from the heavy rotation used by the National Broadcast Company during their coverage of the 2012 Olympic Games in London, which helped to introduce (and in some instances re-introduce) the song to a much broader audience. What this most likely suggests is that people do not correlate their listening habits to major, non-music related events, as one might have expected from the country music analogy premised earlier in this discussion. Instead, we mostly see meaningful correlations where music and/or performances are integral parts of an event in order to have any discernable effect on the *Billboard* Top 100 chart. These include events such as the Super Bowl where the Halftime show is often more popular than the actual sporting event and becomes an event unto itself, as was the case in 2012. This also includes the use of music in television, whether in the reality competition setting like *The Voice* or in music-driven sitcoms like *Glee*, or even in some instances as soundtrack music for pivotal moments in popular shows. Finally, we see that the deaths of musicians play a role in affecting the makeup of the charts for a short period of time, as was the case in the death of Whitney
Houston, although the circumstances for such an event seem to be strictly reserved for deaths that are widely unexpected.

This leads us to conclude that popular music is essentially ephemera and only reflective of what individuals impose on them. What we see in instances like the Mars Landing or National Political debates is that no one song can rise to the top of the charts because there is no focused promotional effort behind any one song (unless one already exists). The mechanisms used to market and promote music and artists are so intricate and complex that the organic nature one might expect to see simply cannot flourish. True, there are some sleeper hits on the charts such as American rock band Imagine Dragons’ song “Radioactive”. But the likelihood of this happening is slim at best. The obvious exception is when a song is identified as a part of the marketing campaign, as was the case of Phillip Phillips’ “Home”. While there may be some potential for catching a much broader spectrum of identifiable trends and correlations, one would need to fully understand the psychology of music perception, social/cultural trends, and lyrical and implied context of nearly every in a certain time frame.

What then does this say about predictive search? If we revisit the study of media and trend predictions, we see that the results illustrate two points: first, although search data is indeed predictive of future outcomes, alternative information sources often perform equally well or even better; second, search appears to be most useful when key indicators (e.g., past sales performance, production budgets, etc.) do not exist or are unavailable (Goel et al., 2010, p. 17488). These alternative sources of information in our situation do exist in the form of general marketing data, which offers far more substantive explanations to rises in performance than external influences like current events, and are much easier to determine.
obviously related correlations than more abstract data points like the general emotional response to an event.

With movies and video games, we find that the predictive power of search was much more meaningful. But for music,

search performs worse than the baseline... These findings raise interesting questions regarding the circumstances under which search-based predictions might be useful. Most obviously, the importance of the baseline models suggests that search-based predictions can yield the greatest performance boost when key information- such as marketing or production budgets- is difficult to acquire. (Goel et al., 2010, p. 17488)

Goel et al. (2010) go on to express a sentiment we shared, which is that given the attention that search-based predictions have received recently, it may seem surprising that search data is, at least in some cases, no more informative than traditional data sources... Ultimately, the utility of search counts for prediction real-world events may have less to do with their superiority over other data sources than with matters of speed, convenience, and flexibility across a variety of domains. (p. 17489)

As Anand and Peterson (2000) state regarding the causal relationship between events such as appearances on national television, the winning of a Grammy or other coveted award, a focused targeted promotional campaign, or significant personal events in the artists’ lives, what we have seen in this study is these conclusions have remained true, despite the increased level of access we have now to multiple and possibly more reliable data sources (p. 280).16

16 Anand and Peterson worked with Yahoo! Research in order to draw their conclusions, whereas the data we have collected comes from Google, the most overwhelmingly popular search engine available.
In the instance of the original premise of the rise of country music, much like Goel et al.’s statement, we are able to pinpoint an alternative explanation as to why the rise of country music appeared to be so pervasive in the early-2000s. At the introduction of SoundScan in 1991, Anand and Peterson show that there was a sudden influx of country music sales being charted (2000, p. 277).

![Genre Composition of the Billboard Chart](image)

**Figure 11. Genre sales for heavy rock, country, and R&B pre- and post-SoundScan incorporation (Anand & Peterson, 2000)**

According to Anand and Peterson’s (2000) analysis of the incoming SoundScan data, the reason for country’s “spectacular gain on the SoundScan chart was that country music had greater sales than those being reported all along, and that these had been underreported when Billboard’s old chart compilation methodology was used” (p. 278). The same is likely true for the 2000s era shifts. Like the country music chart, Chris Molanphy (2014) of *Pitchfork* notes that on the Hot R&B/Hip-Hop Songs chart,
Billboard still wasn’t factoring iTunes and its ilk into its black music chart in the late 00s; only physical singles sales still counted... For all intents and purposes, then, during the 00s, Hot R&B/Hip-Hop Songs was an all-radio chart... This overreliance on radio made the chart rather hollow...for nearly eight years- even as the Hot 100 became reenergized by iTunes, and eventually Spotify (added to the Hot 100 in 2012), and YouTube (2013)- Billboard’s editors resisted adding digital consumption data of any kind to the Hot R&B/Hip-Hop Songs chart.

What this means is that the smaller charts such as the Hot R&B/Hip-Hop Songs chart and Hot Country Songs chart immediately benefited from Billboard’s incorporation of digital data and streaming data because the data collection methodology used before those specific measures were incorporated became more accurate. This is the most plausible reason why country music and hip-hop (the two largest music genres on the 2012 Hot 100 chart at 83 songs and 110 songs, respectively) saw such exaggerated boosts in the early-2000s. When the data became more accurate, the Billboard charts became more representative of the true makeup of our general listening trends, which produced an artificial rise in popularity in the charts.
ISSUES

Data Sources

One of the primary issues we encountered was the data sources themselves. As it has been noted previously, the *Billboard/SoundScan* methodology was far from error-proof, and some even went as far as to actively distort the data for the benefit of an artist or record label. In response to the pre-*SoundScan* era, Anand and Peterson (2000) note that though the methodology was less prone to tampering, it was far from perfect.

Much attention was focused on the reliability of *Billboard*’s methodology because, outside of the research department, it was impossible to independently verify the accuracy of the rankings. Over the years there was a chorus of complaints that it was possible to directly or indirectly ‘buy chart position.’ At least four different tactics were regularly mentioned. First, bribing reporting outlets to report more (or less of rivals’) sales. Second, influencing *Billboard* to add what were asserted to be “more representative” reporting outlets or drop allegedly “biased” ones. Third, buying advertisements in *Billboard* magazine in exchange for improved chart position, and, more infrequently, directly influencing *Billboard* editorial or research department personnel… *SoundScan*’s proposed methodology promised to overcome most of the reliability and validity problems inherent in *Billboard*’s way of compiling the charts… The introduction of *SoundScan* led to three major changes. First, there was a change in the relative strengths of various music genres represented in the chart, with country music making spectacular gains largely at the expense of pop music. Second, a greater number of albums reached the much-vaunted number-one position, and reached peak chart position more swiftly. Third, specific types of records were advantaged or disadvantaged. in particular, there was a fall in the number of independent labels and new artists appearing in the chart, and the proportion of R&B, country, and heavy rock records on the *Billboard* chart pre-and post-*SoundScan* are shown. (p. 276)

Obviously, after the introduction of the point-of-sale methodology, attempts at gaming the system would become more complex. However, more complex payola schemes became more
and more of an issue culminating in 2006 when radio programming and music directors were bribed and incentivized to play more of specific artists and their music, etc. in order to boost the impression rates and airplay totals for their clients (Ross, Esposito, & Walter, 2006). While the overall impact of these efforts might not be as apparent, it does call into question the overall validity of the charts, themselves. Even today, the possibility of modifying reports from retail outlets sent to SoundScan is more than feasible. To complicate matters even further, it is important to remember that Billboard is not an unbiased entity. While they do present the most comprehensive look at the music industry through their charts, they also are not outside of the realm of influence.

In an era of music that it is commonly seen as “easy” within the industry to reach number one on the smaller charts, the lengths some record companies will go to ensure that this happens to boost sales and marketing efforts cannot be overlooked. This calls into question the ability of the charts to gauge any kind of public pulse. For example, Molanphy (2014) notes that in October 2012, Billboard finally modified the collection methodology for some of the smaller genre charts:

The magazine announced an overhaul to its R&B/Hip-Hop, Country, and Latin Songs chart, all incorporating digital sales and streaming for the first time… The word that recurred throughout Billboard’s announcement of the chart changes was “crossover”.... This was an acknowledgement that the mass of pop was going to control the fate of the genre charts.... Fans of Hot Country Songs were aghast at the changes; the very first week of the switch, an especially poppy Taylor Swift song that wasn’t scoring much airplay on country radio stations shot to No. 1 on the revamped Country chart.

This was further compounded as the Hot Country chart crowned newcomers Florida-Georgia Line’s song “Cruise” as record-holders for time spent at the number one spot, knocking out
Eddy Arnold’s “I’ll Hold You in My Heart (Till I Can Hold You in My Arms)” at 22+ weeks. According to music critics,

By incorporating airplay from all genres, paid digital download sales, and streaming into chart rankings for its genre-specific song charts, it has failed to acknowledge how much this new chart record misrepresents the real impact of “Cruise” compared to other big country hits. (DEB G, 2013)

If the genre charts are no longer representative of their own genre, what use is there to these charts at all? *Billboard Magazine* writer Nelson George (1982) noted that in the example of the Hot R&B chart, the chart was created in the 1940’s to give voice to a growing segment of American music that had not found its way into the mainstream yet, namely music created by African-Americans (p. 10). Coincidentally, that chart has both been discontinued after the boom of Motown-era music (after discovering so many similarities in the chart with the Hot 100) and it was determined that a separate chart was no longer necessary, only to be re-instated after the British Invasion of bands like The Beatles and The Rolling Stones. We may be in the midst of one of these convergences now where the true ability of a chart to accurately display public listening preferences is questionable, and will remain so until a better methodology is implemented.

With “crossover artists”17 like Swift, the lines that separate genres of music are becoming more and more difficult to distinguish. Often times, artists are pegged as multi-genre acts to appeal to wider audiences, or contain multiple elements of different genres, or

17 Crossover artists are generally artists who appeal to a much wider base than simply one genre. In the example of Taylor Swift, she was primarily considered a country music artist with elements of mainstream pop, and thus had the opportunity to have her music played on both country music stations and top 40 music stations.
even create new genres for themselves. How we categorize music becomes problematic if we are seeking broad genres from which to draw conclusions as they affect the composition of the charts and the general assumptions one needs to make to find meaningful correlations, such as the ones this study tried to find. The issue is not necessarily the genres themselves, but maintaining any kind of objectivity in how we determine where an artist, or even individual songs, will be difficult to argue.

Another issue that presented itself was a notion that researchers from Queen Margaret University College and University of Glasgow reminded us of, which is that the recording industry, as represented by the Billboard chart, is not indicative of the entire music industry. They note that,

The definition of the recording industry as ‘the music industry’ has become enshrined in trade publications such as *Music Week* and *Billboard*, which repeatedly report on the actions of a single music industry… Within these pages there are abundant examples of the conflation of the recording industry with the wider industries. (Williamson & Cloonan, 2007, p. 309)

While the recording industry is a major part of the music industry, there could be other factors to account for when considering the effect an event would have on the broadest iteration of the music industry. If we were to include less mainstream and “counterculture” representations as well, we might see a much different picture as these aspects of the industry are typically viewed as more responsive to current events in tangible ways that are recorded outside simple chart position statistics.

Another major issue with the data sources rests in the collection of the Google Trends. While they most likely presented unbiased information, the actual trends that Google chose to display from year to year seemed very haphazard with some years displaying charts for Top Halloween Costumes to Top Podcasts, when these topics did not appear on other
year-end lists. This made establishing consistency between the charts problematic in finding a control group, however this was unlikely to have affected the focus of the study. It would have also been useful to have raw data in the form of aggregate searches or some kind of numerical representation to further understand search habits from month to month, rather than a total representation in the form of a Top 10 list.

One ongoing question that complicated the Google Trends data that was collected was the lack of information on the “psychology of search”. On one hand, the idea of using Google to search for a topic seems rather straightforward. However, as Google has evolved into a much more complex search engine, so have we as search users. No longer are we limited to using simple keywords and phrases to search for our queries, though that may or may not be the preferred methodology still. Perhaps now we have become wired to present more complex questions to Google to request information in order to adjust our search to the new algorithms used, as is often satirized in BuzzFeed posts, which mocks the predictive search function of the site.

Not only are we more complex search users and Google a more complex service, we as a user-group seem to search for some of the most bizarre and outlandish pieces of information. In our study, we noticed that search trends often revolved around celebrity culture. Over half of the 2012 search trends could realistically be labeled as “celebrity-related”. Some examples of this include, “Megan Fox gives Birth” and “#Eastwooding”.\(^{18}\)

\(^{18}\) #Eastwooding is a reference to actor Clint Eastwood’s appearance at the 2012 Republican National Convention during which Eastwood had a conversation with an empty chair as his address to the convention. This was later heavily satirized online.
which could be indications of our own obsession with celebrities. This might be a viable explanation for Justin Bieber’s continued success, as he is mentioned in the 2012 search trends list multiple times. This question also presents the related question of who is actually using search today? Based on anecdotal analysis of the search queries, the constituents executing the most popular searches skews young. However, as we become more and more reliant on information being delivered to us via push notifications on our mobile devices or Facebook and Twitter’s latest “Trending” news feeds, how will this affect Google’s trend data? In many instances, we no longer need to search for major stories, or even viral ones as they are presented to us without necessitating the extra effort of finding these stories out on our own using search engines. While the need for search engines will unlikely diminish in a substantial way in the near future, the methods and the reasons we use them will undoubtedly change. Clearly, with over a billion users of Facebook alone, this will need to be accounted for in determining what truly is trending.

Understanding why we search for particular queries whether it is personal interest, the desire to stay current, etc. might be useful in unlocking social trends, in general. A service like Google Correlate might be better suited to show statistical relationships between search queries, which might lead to a better understanding of the exact reason why people were searching for that particular topic. By better understanding the “psychology of search”, we might have a better sense of what search can provide insight into.

**Methodology**

An alternative approach to this study would be highly recommended as perhaps the most problematic piece of the research was the methodology. While it would seem linewidthственно reasonable that there would be a strong correlation between the rise in
nationalism following the events of September 11, 2001 and the rise in popularity of country
music, on a broad level, this is simply not realistic to discern. As it was noted previously, the
big machine of the music industry is usually the driving force behind the movement and
momentum of the year’s biggest songs and artists. However, if we use Google Flu as our
example, there may be detectable fluctuations in music performance, but on a much smaller
level. Part of the success of the Google Flu project was that they were able to use incredibly
granular data that would detect shifts and spikes by the second, whereas this study focused on
seeing broader, general shifts. A possible correlation could be found between unrelated
events and music performance on a micro-level if one had access to minute-by-minute search
data as well as raw data from one of the major streaming music sources, for example. One
might even conceivably find more correlations if the study was limited by physical region. In
essence, removing the variables that this study was forced to contend with, including (but not
limited to) granular data access, limited methodology, data inaccuracies, etc., a similarly
focused study may yield different results, but as a general study, “alternative information
sources often perform equally well or even better” (Goel et al., 2010).

Another potentially problematic component to the methodology of this study rests
simply in the idea of determining a specific time and date of shifts in culture. The difficulty
in asserting that major shifts in our society bring about changes in our listening preferences
rests in the proposition of finding the actual moment we declare that a shift has occurred.
Must like the evolution of the Internet itself where one could argue that the beginning of the
Internet was the formation of the ARPANET in 1969, or perhaps in the 1990’s with the
discontinuation of ARPANET at the formation of ISP’s, or anyplace in between, history is
anything but linear or binary. In order to ascertain any kind of information based on our
social trends, it must be treated as a constantly evolving entity. For example, it might be more productive to track the growing popularity of digital music’s evolution from the age of Napster and peer-to-peer file sharing, the creation of the iTunes Music Store, and the explosion of YouTube, to today’s culture of streaming music and its relationship to the rise in popularity and output of electronic music. One might argue that the increasing ease of distribution of music, along with the ease of use and effectiveness of consumer-level music creation tools such as Garage Band, ProTools, etc. has made it significantly easier to produce quality electronic music making it easier gain popularity. But this trend would need to span years, possibly decades, in order to show any kind of substantial change. The data one would also need to properly interpret these shifts in culture would need to be more reliable than ones this study had access to.

Similarly, celebrities who had multiple events that registered as trending searches were problematic to assess due to the fluctuating nature of the event. For example, Justin Bieber was mentioned multiple times in the Top Trends lists for a multitude of reasons. On March 26, 2012, Bieber released his third studio album Believe, which produced six charting songs. In July, Bieber was cited for reckless driving in Los Angeles, the first of many encounters with police in 2012. In September, Bieber began a corresponding world tour to promote his recently released album. In November, it was announced that Bieber ended his relationship with fellow teen idol Selena Gomez (Oldenburg, 2012). Each of these events undoubtedly affected the sales and performance of his album and singles, for better or worse. However in this instance, the release of his album was the most likely the catalyzing factor that determined the album’s performance on the Billboard charts. But an argument could be
made to determine where these related micro-events affected its performance on a miniature scale, as well.

Essentially, the nature of this study would be better served by dramatically reducing the number of variables in the study. For Google Trends, by limiting the scope in trend data to one or two related trend topics specifically, as well as having a clear definition as to what constitutes a cultural change (i.e., the rise in popularity of digital streaming), would alleviate some of the more symptomatic issues in that data. For the Billboard/SoundScan data, by similarly narrowing the search field to a single period, artist, genre, etc. and using micro-events as the determining factor, we might get a better sense of the effect those events have on a much smaller scale. That being said, it is highly likely that record companies and management groups are already doing this work in order to better coordinate marketing efforts for their clients, as they are ultimately the gatekeepers for that sort of data.

Another potentially viable source of data might be the use of Facebook/Twitter mentions during a given year. Given the meteoric rise of the social network and seeming ubiquity in popular culture, social media outlets might be a better indicator of checking the pulse of the American public. Because of a social network's direct connection to individual voices and opinions rather than the implied connection of search trends, tracking popular culture through these channels might be more productive, if the data was ever made public.

Music Interpretation

The final variable that we would like to address is the unique qualities of music that affects people in different ways. In many instances, we have seen that music is a reactive art and even recently, albums have been released ahead of schedule to address cultural issues such as the racial tension between African-Americans and police following the shootings of
Michael Brown and Eric Gardner in 2014. Albums like R&B musician D’Angelo’s *Black Messiah* and rapper Kendrick Lamar’s *To Pimp A Butterfly* were released at accelerated rates in order to address the unrest of their audiences, as well as to potentially inject their music into the popular conversation (A. Smith, 2015). If we look at music in this context as a reactive cultural art in addition to an expressive one, it would be necessary to address the fact that people interpret music and express themselves through it in often very different ways. In her research, Marion Guck (2006) asserts that the interactions we have with music are incredibly unique to our own experiences have studied the science of music perception:

The interactions [Bollas] considers have the purpose of enacting an individual’s personal ‘idiom,’ but for the interaction to succeed he emphasizes that it is crucial that the human agent respect the ‘distinct structure of the object,’ that is, its own separate integrity… Bollas writes about the way in which an individual ‘speaks the self’s aesthetic through his [or her] precise choices [of object] and particular uses of its constituents.’ Choosing a recording elicits different inner experiences from choosing a book. This is because each object ‘has a potentially different evocative effect by virtue of its specific form which partly structures the subject’s inner experience and constitutes the eros of form in being’. (pp. 195-196)

What these two researchers are rearticulating is that the perception of music varies from individual to individual. There is some commonality in the way we interpret music on a broad scale by virtue of Western structures such as scale, melodic and harmonic choices, form, etc. but we each have our own way of internalizing music or cultural artifacts in a way that is distinctly varied. According to Cross (1998),

the functioning and structure of cognition are determined at least as much by culture as by biology, and, accepting that postulate, that any claims for the universality of cognitive-scientific theories of music must be circumscribed. While many writers have sought to account for mind in terms of neurobiology- or rather, in terms of computational theories of neural structure and function- some recent theories have proposed that while biology is an evident constraint, the primary determinant of the nature of cognition is culture. (p. 15)
To say that Americans have one common culture to derive a common experience or understanding would be contrary to popular beliefs about our inherent diversity. While there may be some similarities that do exist, perhaps the only common thread that connects us all is our difference.

Guck (2006) uses an example by Tia DeNora who asserts that,

Music is a particular case of interaction between a human agent and a cultural artifact... ‘users configure themselves as agents in and through the ways they relate to objects’ while they also ‘configure objects in and through the ways they— as agents—behave towards those objects.’ For example, her informant Lucy listens to Schubert Impromptus when feeling stress, using the music as ‘a catalyst’ or ‘accomplice’ that is active in... ‘de-stressing’. (p. 195)

The same must be true in the case of popular music. While one person might interpret musician John Mayer’s “Shadow Days” (released April 27, 2012) as a metaphor for one’s general sense of overcoming personal adversity, another might take the meaning deeper and relate it back to Mayer’s own struggles during the previous two years of his career.¹⁹ Neither interpretation would be incorrect, but given the latter interpretation, some people might feel disinclined to support him, regardless of his music out of sheer dislike for his past character.

Even the simple act of characterizing music based on the most general of emotions could potentially be a complicated endeavor. In this example, one could interpret “Shadow Days” as “happy” based on the mid-tempo groove, “contemplative” based on the lyrics, “sad” based on the melody, “hopeful” based on the chord structure, etc. The many factors

¹⁹ John Mayer dealt with a significant amount of backlash over insensitive comments he made to Rolling Stone and Playboy magazines, as well as a highly publicized break-up with Jennifer Aniston. He was also forced to undergo throat surgery to remove a granuloma in his vocal chords, which prevented him from singing or speaking for nearly a year.
that affect how people interpret and interact with music are perhaps what make the interpretation and interaction with it so exciting and unique.

Musical experience happens in the negotiation between an individual’s sensibility and some music’s affordances. It happens in the individual’s imagination, which additionally brings sensations of action and intensity to the sounds. Under this conception, musical analyses already reflect interpretive activities that use musical feelings to create intentional objects… If we are to understand music, we must investigate how music and listeners interact.” (Guck, 2006, p. 194)

In conjunction with this thought, if we are to understand how music affects us on such a broad scale as the one proposed in this study, we must better understand ourselves and our agency first.
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