

Music Interaction Trends in Finland: YouTube and Spotify

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ABSTRACT

Music interaction refers to different ways human interact with technology to produce, enjoy, and distribute music. The most common form of interaction is surely listening. Despite its popularity, it has received surprisingly little attention in human-computer interaction studies. In this paper, we describe two case studies that characterize music interaction with streaming services in Finland. We use both public and proprietary data to reveal novel insights about the present music consumption culture in Finland. We first compare two popular streaming music services, YouTube and Spotify. We look at the relative ranking of the most popular music across services and temporal access patterns. We find high correlations of popularity between the two services and consistent peak in listening indicators over Friday and Saturday. In the second part, we document some detailed statistics about user engagement with the most popular Finnish music on YouTube. For instance, we find a highly local audience (>90%) who on average retain their interest in the videos less than 70% of the total duration. We finally connect these findings to existing literature and the call for further qualitative research on the topic.

Categories and Subject Descriptors

H.5.5 Sound and Music computing

General Terms

Human Factors.

Keywords

Music interaction, digital media, streaming music, digital video.

1. INTRODUCTION

Digital music download sales sunk in US for the first time in 2013. Ever since (illegal) Internet downloads became possible, the music industry has gone through hard times and the sale of CDs has long been decreasing. Many are waiting to see if the streaming digital music services can make up for the losses. From an HCI perspective, these developments are interesting. Previous research [1, 3] has hinted about the importance of new music services, but we still know little of the use of music streaming.

The present era of streaming services has seen an unexpected emergence of YouTube as a music source. This presents an

interesting case, because it clearly was not designed for music distribution. This is demonstrated by the neglect for audio quality, disregard for and the incoherence of musical meta information. Instead, YouTube has been appropriated [2] for music by users.

The main goal of our study is to increase understanding of digital music service use in Finland. We are particularly interested in YouTube, which seems to be a very important music service as well and see how it compares to Spotify, a music-only streaming service. We look at two questions: similarities of the most popular content (Study I) and the temporal patterns in accessing music (Study II). We also investigate the nature of music listening on YouTube by examining in detail the analytics data for some popular Finnish music videos (Study III).

Our study found similarities in listening between the two streaming services. Although music on YouTube may reach higher overall numbers of impressions, titles from popular Finnish artists achieves high, positively correlated views across services. Our data also reveals that the prime type for the popular music listening is the weekend, suggesting a young cohort behind these figures. Finally, we provide a unique insight into aggregate interaction metrics for popular Finnish YouTube videos. They show us how very local audience these videos have, the great importance of recommendations for finding audience, and the dominance that desktop use still has overall mobile “listening.”

2. STUDY I: HIT SONG POPULARITY ON YOUTUBE AND SPOTIFY

We compared the accumulated popularity of “hit songs” across two digital music services popular at the time. Our intention was not to compile the list of golden classics or the most played songs, but to detect and record overlap of the hits across services.

The comparison was focused on domestic (Finnish) artists, in order to reduce noise in the data, because only globally aggregated data was publicly available. It was expected that comparing foreign artists, or including export-oriented Finnish artists, would bias the data. We learned elsewhere (see Study III) that 98% of the domestic artists’ audience resides in Finland, we believe these globally aggregated figures can be used as reliable indicators of local popularity.

2.1 Methods

The hit songs were determined through in two phases: first generating the list of the most popular artists in Finland in 2008-2012 and then browsing Spotify and YouTube for the most popular track for each artist. The majority of album releases we found had been available in both services since 2008, warranting the comparison (Spotify started in 2008).

The most popular artist shortlist was generated from five sources. First we used Musiikkituottajat ry (IFPI Finland) statistics for the most sold domestic albums and singles. The figures included digital and physical sales. From albums, we observed the ten most sold artists from each year. From singles, the ones exceeding Gold limit (5000 units) in the year of release were included. This meant less than ten entries every year. The next source was the list of recipients of the annual EMMA music award, also organized by Musiikkituottajat. Out of several categories, we picked Album of the Year, Song of the Year, and the Band of Year Category winners for the list. Finally, from the Spotify “Top 100 tracks from 2012 – Finland” playlist we picked the Finnish artists within the Top 30 (7 total). Finally, duplicate artist entries were removed to produce a list of 48 artists (see Appendix).

Using the list of the most popular artists, we visited the <http://www.youtube.com/> using a desktop web browser and used Spotify for Windows desktop client (v. 0.9.0.133) on Sun 26th May and Mon 27th May 2013 within 24 hours to manually find the hit songs. The numbers for the matching Spotify track and the YouTube video were recorded as quickly as possible to equalize the time of the measurement. The idea was to document total plays for the two most played tracks for an artist in YouTube and Spotify, which might be parallel or distinct songs.

The used procedure was that in Spotify we determined two tracks with the biggest number of total plays and recorded the numbers. Then we switched to YouTube and looked for the corresponding songs and the overall most played songs. Due to inherent lack of organization in YouTube, several heuristics were used to find both the corresponding videos. In the typical case, the artist name was entered as the search term and then we scanned for the official video release. If artist or the label had their own channel, “Most popular” filtering was used to identify the most popular releases. If there was no official release, the main search was used to find the particular video implied by Spotify statistics. In some cases, the filter option “Sort by View count” on YouTube search results page was used to determine the most popular videos.

For a few artists, there was no matching information on Plays in Spotify available, so we ended up creating a data point from the most popular YouTube video also available in Spotify. This happened for Stam1na and Pete Parkkonen, in the former case because the artist did not distribute their full catalogue in Spotify. Few songs popular in YouTube from Cheek and Haloo Helsinki! were also discarded because the Spotify apparently displays the Plays only for currently popular ‘trending’ tracks and many YouTube hits were over three years old.

An issue with this method was that for several songs in YouTube, the views were scattered over several videos. We chose the video with the biggest number of views regardless of its source. In some cases it was evident, that the cumulative popularity of a song may have been thrice as high as measured with this method, but it was unfeasible to count accumulated views across all video versions.

2.2 Results:

Consistent popularity across services

We collected data on 117 hit songs. Cumulative these had 276 876 987 YouTube views and 128 213 870 Spotify plays. On average, the hit songs in YouTube had more twice amount of Views than Plays, 2.36M Views versus 1.10M Plays (see Fig. 1). There was less variation among Spotify than in YouTube hits.

Both the standard deviation and range measures were bigger for YouTube than Spotify, demonstrating that there was more potential for hits to ‘get bigger’ on YouTube than on Spotify.

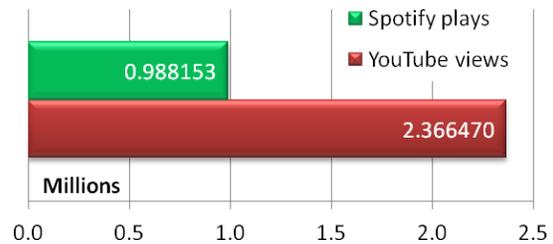


Fig. 1. Bar chart of the average number of views/plays for the Finnish hit songs (N=117) on YouTube and Spotify.

There was a high, statistically significant (Spearman $r=0.74$, $p<0.05$; see Fig. 2.) correlation between YouTube views and Spotify plays. This indicates the relationship is not enforced, but the most popular content has consistent high ranks in both services.

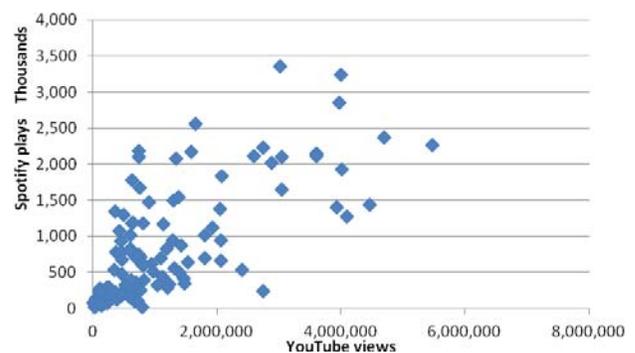


Fig. 2. Scatter plot of hit song views versus plays underlying the correlation figure.

2.3 Discussion

To our best knowledge, this is the first ever documented study of the relative popularity of musical content across two streaming music platforms. Our data shows that despite many differences, both services end up serving mostly the same popular titles in quantities that are strongly positively correlated. From YouTube perspective, this if anything, proves that YouTube is as much as a music service as Spotify is. However, using these aggregate figures to speculate about the differences and similarities of music use across two services is difficult because we don't know the number of users who contribute to them. However, it seems likely that Youtube, a free service, should attract far bigger number of users (for reference, based on ComCast, YouTube has 2.5 times more unique monthly visitors than Spotify web site in Finland).

3. STUDY II: TEMPORAL PATTERNS IN ACCESSING SERVICES

3.1 Methods

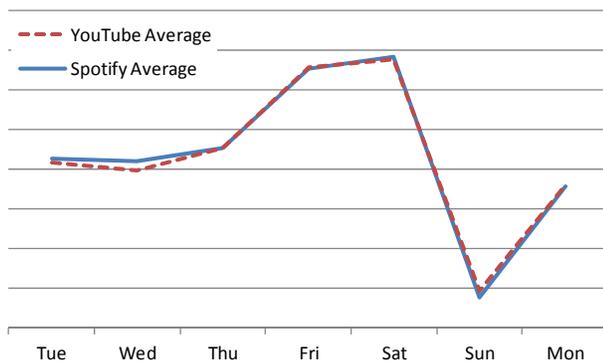
In this analysis we investigated the patterns of weekly interest in music in YouTube and Spotify. This rhythm analysis [5] produces insights about the temporal variations of human activity, in this case music interaction. For the study, we selected ten popular Finnish artists (YouTube) and eight of their titles (Spotify)

performed in Finnish plus a reference point, Avicii. The YouTube data was retrieved from Google Trends for YouTube search. Trends allows the user to see the search interest index for any given day, over a chosen geographic area. We were interested in the weekly patterns in Finland. This seemed reliable, as the interest towards an artist is likely change over a weeks, not in a matter days (a granularity of a day is available). We extracted search Trends data for some music-related keywords popular in Finland for the time span between April and September 2013. As granularity of a day was only available for 90 days at a time, we sampled three from the start and four from the end of the period.

The Spotify data was extracted manually from Spotify Windows desktop client in two sequences (4 + 4 weeks) over summer 2013. The client provided daily updated cumulative plays for the ten trending tracks for each artist aggregated across the world. Thus we could calculate the daily portion by subtracting two consecutive days. The validity of the figures was confirmed by a representative of a label with an inside access to Spotify statistics. This method complicated the data collection somewhat because some of the chosen titles became unavailable due the course of the study. There were also issues with the data not updating daily as expected which resulted in missing data. The fact that play figures are aggregated means that we must presume that the Finnish artists' data reflects the behavior of Finnish users.

3.2 Results: Popular music activities peak for the beginning of the weekend

We included Trends data for six artists and Spotify data for nine songs (total 5.1 million plays). The averaging interest indexes for each term produced the trends charts displayed in Figure 3. It shows a very clear converging peak for the Friday – Saturday period, with a notable decline on Sunday, rising through Monday to a level constant from Tue to Thu.



However, due to the indexical nature of the data, we cannot

Figure 3. YT Stacked line chart of average indexed YouTube search activity and Spotify daily plays, based on 6 to 8 titles. Y-axis omitted because the data points time series are only comparable within themselves.

estimate the size or statistical significance of the effect. The Spotify data showed that the weekend peak was approximately 1.35 the average where as the valley was 0.75 time the average. From YouTube Trends, we also have reference data for an international artist. Figure 4 suggests that the weekend trend observed consistently for Finnish songs is also visible for Avicii.

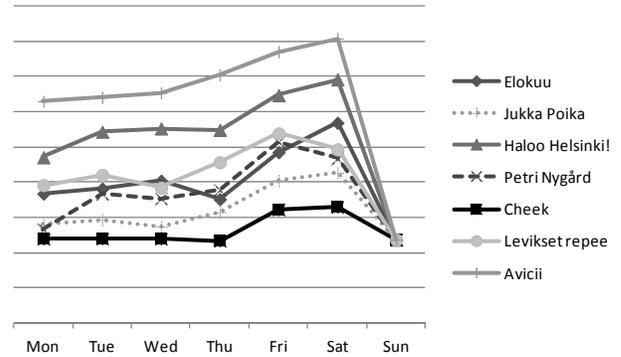


Figure 4. YouTube search trends six Finnish artist or popular song names over a one week period (data from three months).

3.3 Discussion

In this study, we found surprisingly consistent pattern of music access over the course of a week. Although our data is limited and susceptible to several disclaimers, it effectively demonstrates converging music interaction behavior across the compared media platforms. Looking at our results, one should acknowledge that our data covers only few popular artists. Because we decided to use public data, focus on Finnish music, and popular artists, we don't feel confident in generalizing this finding to all musical niches or the whole population. However, this undeniable trend provides an interesting starting point for any qualitative study that looks into the moments with music through the week.

4. STUDY II: AGGREGATE MUSIC INTERACTION MEASURES ON YOUTUBE

4.1 Method

Every YouTube user sees some basic statistics that describe the cumulative amount of engagement with a video. Besides the total number of views, comments and votes, YouTube collects extended analytics data which is available for video uploaders. In order to understand the characteristics of use for music videos, we requested access to some analytics for the most popular videos by Finnish artists from their record companies. As the data is must be manually extracted and embeds an unknown business value, it became available to us in limited quantities. We requested data on videos that were somewhat exclusive to Finnish audiences due to their language to have information comparable to previous studies that also focused on Finnish artists.

4.2 Results

In total, we received data for 9 videos during summer 2013. These had gained in total some 29 million views. The essential descriptive statistics of the videos are presented in Table 1. The first observation concerns the geographic distribution of the audience. 95% of the viewers for the Finnish videos were located in Finland. The remaining 5% of viewers typically come from the neighboring countries Sweden and Estonia.

For accessing videos, YouTube website on a computer is the most commonly used combination for watching the videos. In 2013, the share of mobile users was still small (11%) although there was a notable variation between artists, suggesting that there were quickly emerging differences due to different segments that have different viewing habits and devices.

Statistic \ Video title	Average	St.Dev.	Frontside Ollie	Robin - Puuttuva Palanen feat. Brädi	Jippu & Samuli	Jenri V : Muru	Mikael Gabriel - Päästä mut pois	Movetron - Eikenenkään maa	Teflon Brothers - Seksikkäinjäbä	Jesse Kakuranta - Vie mut kotiin	Stig : Viheltelen
Total views	3,234,495	3,002,636	10,420,486	4,473,275	4,206,327	3,262,134	1,677,344	1,499,353	1,348,000	1,143,943	1,079,595
Finnish views	94.5%	4.3%	94.8%	96.1%	91.48%	85.43%	97.6%	91.4%	97.6%	97.1%	98.8%
Length (min:ss)	3:51	0:39	3:02	3:38	3:49	3:45	3:24	3:59	5:24	4:07	3:32
Retention	69.7%	11.5%	56.0%	77.1%	72.1%	68.4%	91.0%	50.9%	72.4%	69.8%	69.8%
Playback Locations											
YouTube watch page	84.2%	11.1%	80.7%	71.0%	94.2%	94.9%	73.8%	98.0%	73.9%	95.0%	76.7%
Mobile site & apps	11.9%	10.9%	12.1%	26.2%	2.8%	1.2%	22.4%	0.1%	20.4%	0.1%	21.7%
Embedded player	3.5%	1.9%	7.1%	2.7%	2.5%	3.4%	3.7%	1.5%	5.6%	4.0%	1.3%
Traffic Sources											
YouTube Suggested c.	47.5%	16.2%	29.0%	28.2%			37.7%	66.8%	30.1%	55.3%	
YouTube Search	24.7%	6.4%	34.3%	32.3%			19.1%	21.0%	32.3%	26.3%	
Mobile Apps Unkwn	15.3%	10.8%	18.9%	29.4%			26.6%	5.5%	24.6%	4.6%	
Feeds +Subs	8.1%	5.2%		0.8%			8.1%				
Embed	5.6%	2.2%	7.1%	2.7%					5.6%		
Ext Web	4.1%	0.8%	5.1%	3.6%			3.6%		4.6%		

Table 1. YouTube analytics data for nine popular Finnish music videos as released by the official label channels

Another important findings concerns the degree of retention, the sustained user attention measured in the proportion of time kept watching. The Table 1 shows that the retention ranges from 50% to 91%. This means that although there is considerable variation between the videos, it is not typical that people would view the music videos in their entirety. The variation in the duration of attention can be better understood by the graphs in Figure 5 that illustrates retention for two popular videos. Absolute retention generally declines in the exhibit A as people stop watching towards the end. However, in exhibit B, data for “Seksikkäinjäbä” video, one can see that the audience sometimes skips the first minute minutes, an intro part of the video, resulting in a non-linearly decreasing absolute and high relative retention after it.

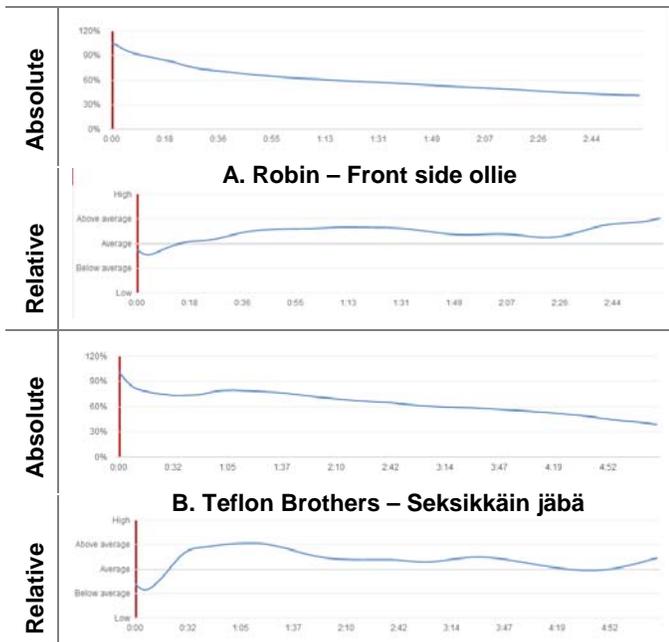


Figure 5. Audience retention graphs, absolute and relative, for two music videos, “Frontside Ollie” and “Teflon Brothers - Seksikkäinjäbä” (right). Graph shows the proportion of viewers watching the video at a time.

4.3 Discussion

In this study, we have revealed some exclusive data of audience engagement with nationally popular YouTube music videos. To our knowledge, this is unique revelation of what actually happens beyond the numbers publicly displayed. The central findings concern the quite high retention, previously it has been reported that the overall retention in Spotify is 51% [4]. This means that at least the YouTube hit songs capture users better than Spotify.

5. CONCLUSIONS

In this study we have documented details of how YouTube and Spotify music interaction [6] in Finland. This study provides a preliminary glance and future work should elaborate and explain the findings through qualitative research. There are many research questions to be derived from our study, e.g., what is the individual behavior that contributes to the aggregate numbers we perceive: the hit song popularity, weekend peak, and the level of retention.

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