Spotify and the Russo-Ukrainian War*

An Analysis of Russian Artist Popularity Amid the War in Ukraine

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4/19/23

Following Russia's escalated invasion of Ukraine in February 2022, countries around the world have sought to end business dealings with Russian companies and boycott pro-Russian public figures. This widespread effort has gone from the highest levels of business and government, to individuals opting to no longer purchase Russian goods or engage with Russian popular culture. This report uses data collected from Spotify API to address two main research questions: Is there a difference in popularity and follower count between pro- and anti-Kremlin Russian artists, and; Two, how are Spotify's recommendation features impacting engagement with Russian artists, and is it able to differentiate between the political leanings of these artists? Among the main findings is that the artist's political affiliation does not seem to have a strong impact on their popularity or following, and that Spotify's recommendations (for both pro- and anti-Kremlin artists) largely promoted the work of artists who have either been supportive of the Putin regime, or have stayed silent amid the violence.

1 Introduction

Amid much of the Western world's efforts to sanction oligarchs, Kremlin-affiliated figures, and Russian businesses, the international movement to limit engagement with Russian popular culture has been an interesting side effect of the conflict. Following Russia's escalated invasion of Ukraine in February 2022, many Ukrainians and Ukrainian allies have rejected any forms of cultural engagement with Russian artists and the Russian language, which ranges from boycotting Western businesses still operating in the country to impacting the music people listen to.

This research paper looks at data collected through Spotify API (Charlie Thompson and Wolff 2022) to understand how politics may play a role in the popularity and follower count

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*Code and data are available at: https://github.com/rutykorotaev/finalpaper

of openly pro- and anti-Kremlin Russian musicians, as well as the role that Spotify plays in recommending these artists to users. The paper will also explore the relationship between an artist's popularity rating and their follower count, to see if there is correlation between the two factors.

Among the pro-Kremlin artists are Basta, Eldzhey, Max Korzh, and Skryptonite, while the anti-Kremlin artists (many of whom have been banned from Russia) are FACE, IC3PEAK, Noize MC, and Oxxxymiron. By pro- and anti-Kremlin, these definitions refer to whether the artist has made a point to speak out against President Vladimir Putin and the war that the Kremlin is waging against Ukraine. Pro-Kremlin artists are classified as those who have either been openly supportive of the war effort, or those who have stayed largely silent, making no mention of the war on their social media accounts, and continue to give concerts in Russia. Anti-Kremlin artists are those who have made public statements condemning the war on their social media, which has resulted in many of them having to leave the country and continue operations in the diaspora, and their music often getting banned within Russia.

The second theme explored in this paper borrows from literature around other social media outlets and how their recommendation algorithms can lead users down certain "mass radicalization" rabbit holes (Moskalenko 2021). While recommendations are most often harmless, at its worst, the recommendation algorithm can lead people down paths to radicalization, entrenching users into information environments that spread mis- and disinformation, conspiracy theories, and far-right or far-left rhethoric (Georgia Hollewell 2022) (Shree 2019).

YouTube often appears at the centre of this literature, as numerous informational enclaves have been discovered on the site, including ones associated with the far-right and far-left (Harindranath 2017) (Champion 2021). However, scholars have noted that the YouTube recommendation algorithm is based on a combination of user preferences, platform features, and supply-and-demand dynamics, and there is disagreement on the extent to which YouTube actually supports the creation of these online communities (Homa Hosseinmardi 2021). Others still have argued that the algorithm is actively working to recommend videos that lead users outside these radicalization "rabbit holes" all together (Ledwich and Zaitsev 2020).

Taking this literature into consideration, this paper analyzes how Spotify's recommendation features might encourage or discourage users to engage with Russian artists across the political spectrum, and whether it takes into account the very open political views of some of these artists.

1.1 Paper Structure

This paper is divided into several main sections. The Data sections (Section 2 and Section 2.2) provide details on how the data was collected, what functions were used to gather the data, and what variables were explored to look at the main two research questions, which focus on how artist politics may impact the popularity of an artist, and what kinds of recommendations are made by Spotify for artists. All graphs and visualizations can be found in this section.

Section 4 will provide an overview of the main results that can be noted from an initial look at the graphs, which will then be further explored in Section 5. Three main findings are noted in Section 5.1, Section 5.2, and Section 5.3, which draw on conclusions made from data. Finally, project limitations and ideas for potential next steps can be found in Section 5.4, which will discuss the various issues related with the dataset and the Spotify API apparatus, as well as potential improvements for future projects. The section will also discuss how the author's personal biases may have played a role in impacting the results of the study.

2 Data: Popularity and Followers

This paper uses data collected using the Spotify API "spotifyr" (Charlie Thompson and Wolff 2022), and visualizes data from four top pro-Kremlin Russian artists and four top anti-Kremlin Russian artists to understand how and if their Spotify popularity score is impacted by their political views. As part of this, the main variables that were used in thiss analysis include the popularity and total followers value which were extracted using the `get_artists` function. In addition, I used data from the `get_related_artists` function, that shows the top 20 artists that come up in Spotify's recommendations when searching any given musician. This paper uses R (R Core Team 2020) to analyze the dataset, as well as several R packages, including "tidyverse" (Wickham et al. 2019), "dplyr" (Wickham et al. 2021), and "knitr" (Xie 2021). For the graphs, this paper used the "Lollipop" and "Scatterplot" templates provided on R Graph Gallery (Holtz 2018).

2.1 Exploring the Popularity and Follower Count Variables: Pro- vs. Anti-Kremlin Russian Artists on Spotify

To start, Figure 1 and Figure 2 use the `get_artists` function to get data on total follower count, Spotify's popularity rating, as well as the artist name and Spotify ID. Below, Figure 1 hones in on the popularity variable and compares the popularity between pro- (in red) and anti-Kremlin (in blue) artists. Figure 2 then looks at whether there is a correlation between the artists' follower counts and their popularity score.

```
Warning: Using `size` aesthetic for lines was deprecated in ggplot2 3.4.0.
i Please use `linewidth` instead.
```
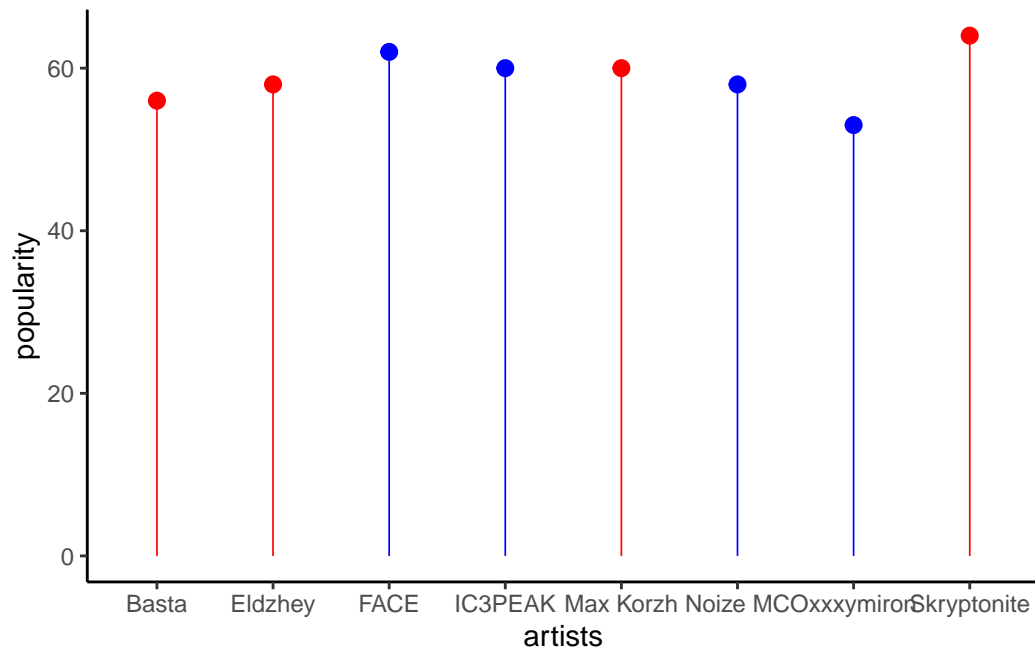
Figure 1: Popularity of Anti- and Pro-Kremlin Russian Artists on Spotify
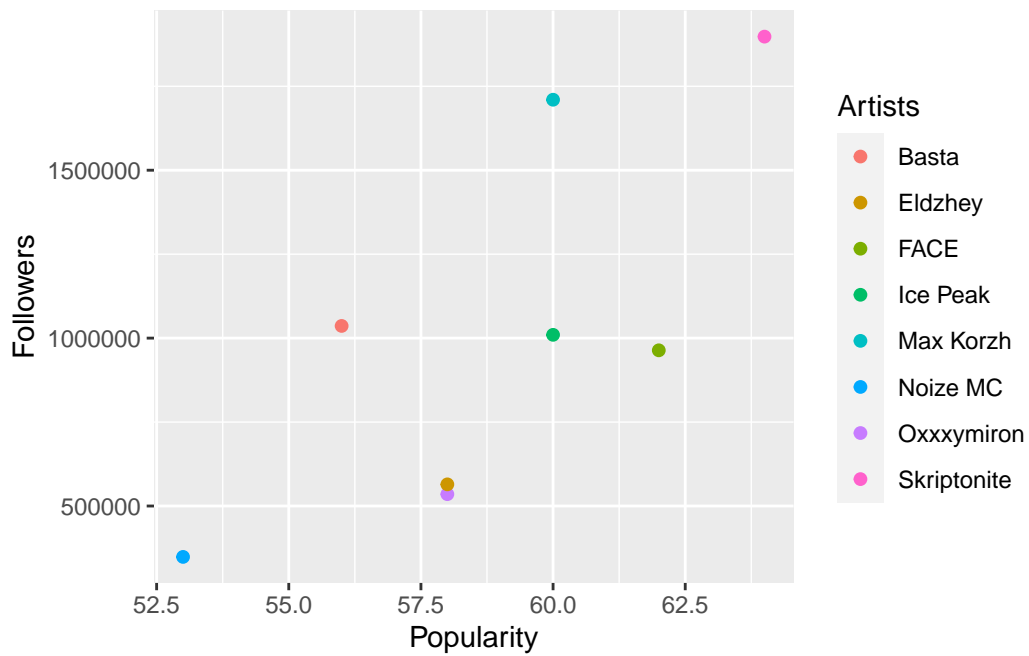

Figure 2: Correlation Between Follower Count and Popularity Score

2.2 Data: Spotify Recommendations

The following visualizations will pertain to the second part of this paper's analysis, which uses the `get_related_artists` function in order to get a list of the top 20 artists that are recommended by Spotify for each artist. Note that in all the graphs in this section, artists deemed as pro-Kremlin have been highlighted in red, while the anti-Kremlin figures are highlighted in blue. In Figure 6, there were many recommended artists that were not Russian, so they have been outlined in green.

As part of the project analysis, each artist that came up in the recommendations was manually reviewed per the definitions highlighted in Section 1. This included analyzing each artist's social media platforms, seeing if there have been any statements or songs about the war or the Putin regime, and noting if they are still giving concerts in Russia.

The below visualizations show the recommendations for the pro-Russian artists Eldzhey, Basta, and Max Korzh, as well as the anti-Russian ones, including Oxxxymiron, Noize MC, and IC3 Peak. The other two artists, Skryptonite and FACE, who had the highest popularity ranking for their respective groups, will be explored further down in Section 3.

2.2.1 Spotify Recommendations for Eldzhey

In Figure 3, we look at the recommendations for the artist Eldzhey, who is one of Russia's most prominent rappers and has been openly supportive of the war in Ukraine. He has been officially banned from entering Ukraine, following a concert he gave in 2018 in the Russian-occupied region of Crimea.
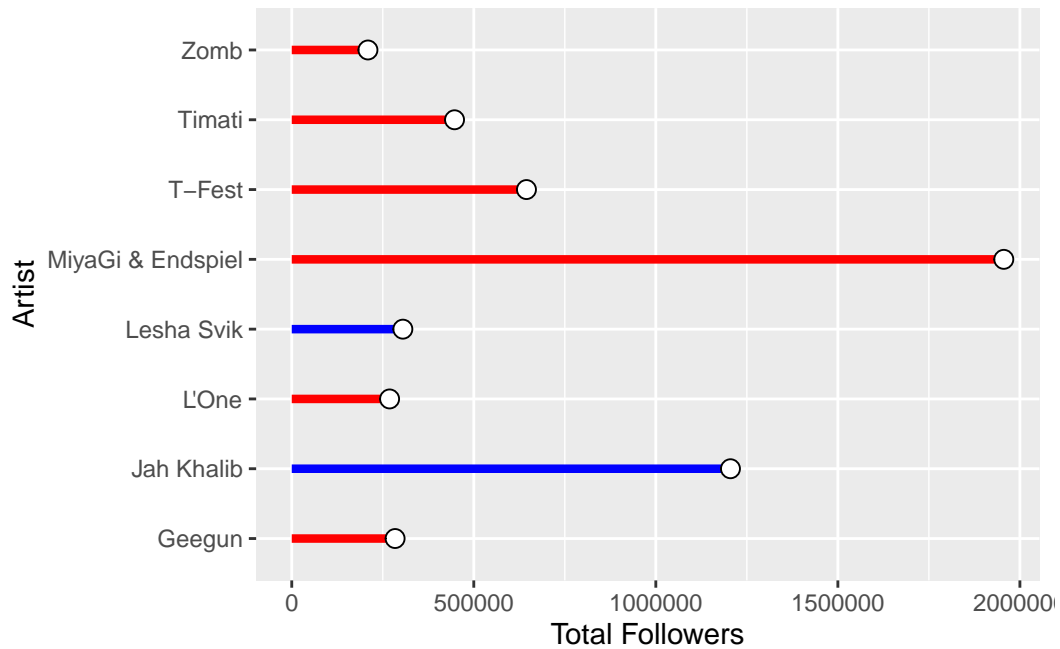

Figure 3: Spotify Recommendations for Eldzhey

2.2.2 Spotify Recommendations for Max Korzh

The following graphic in Figure 4 shows the related artists for the pro-Russian artist Max Korzh. While Korzh is a Belarusian musician, he sings in Russian and continues to perform widely throughout Russia and has previously been denied entry into Ukraine. However, he recently released a song that is viewed as anti-war, though not overly supportive of Ukraine.
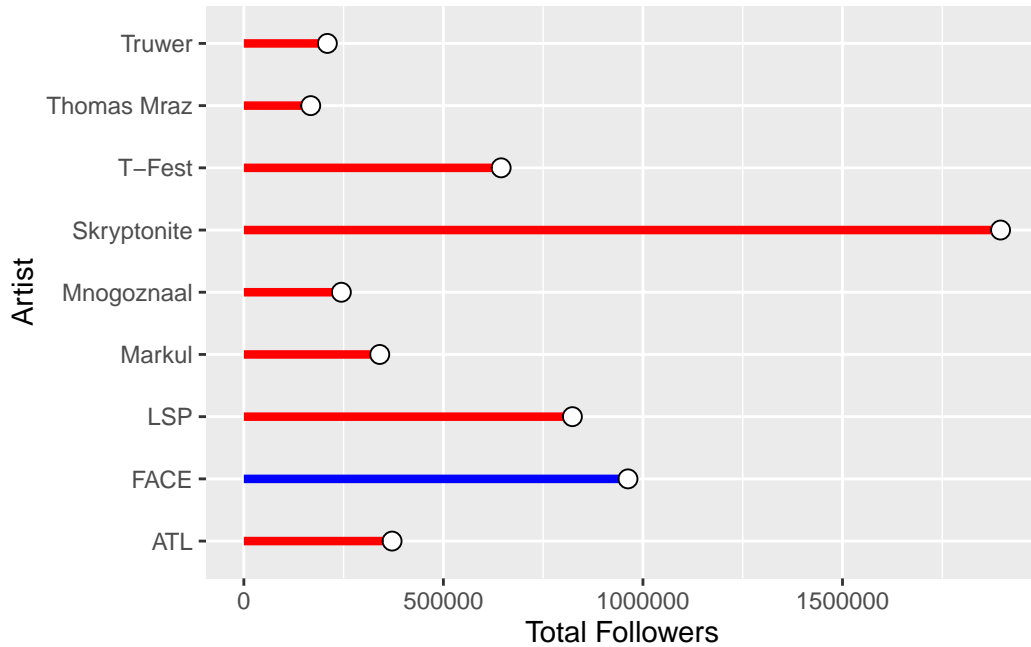

Figure 4: Spotify Recommendations for Max Korzh

2.2.3 Spotify Recommendations for Basta

Next, in Figure 5, we can see the top artists taht were recommended for the pro-Kremlin artist Basta.
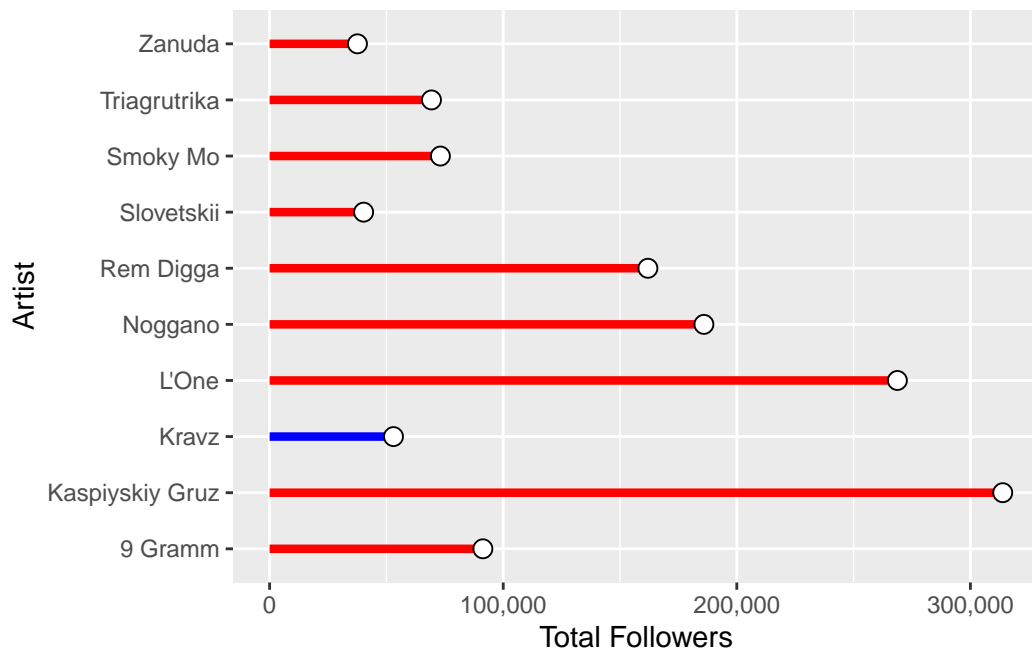

Figure 5: Spotify Recommendations for Basta

2.2.4 Spotify Recommendations for IC3PEAK

Next, I will be showing the recommended artists for the anti-Kremlin Russian artists. Below in Figure 6 is the visualization for the rapper IC3PEAK.
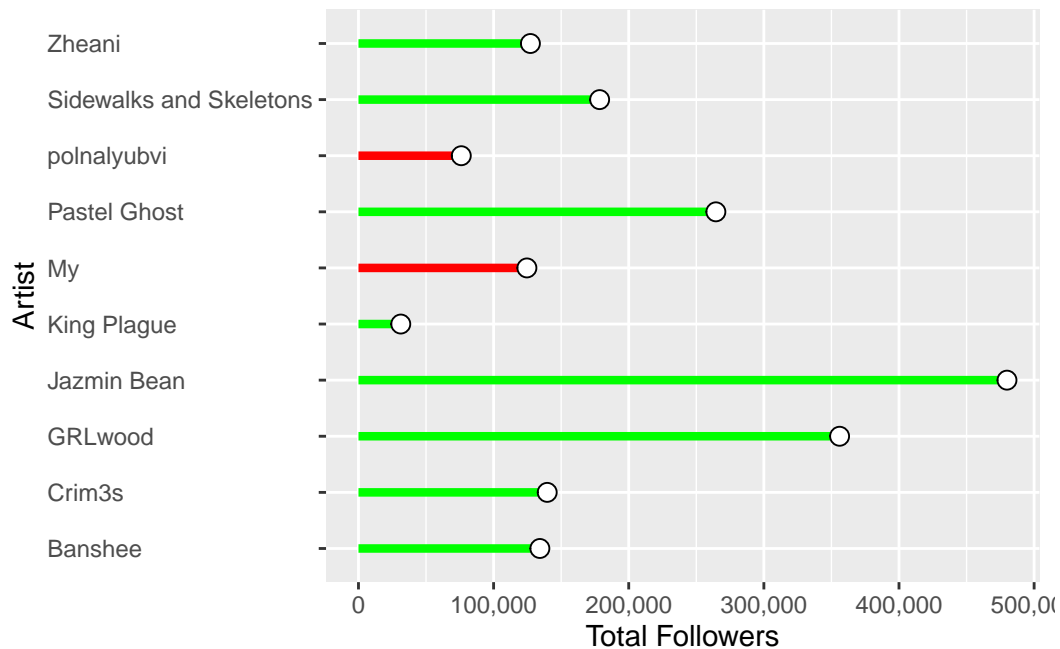
Figure 6: Spotify Recommendations for IC3PEAK

2.2.5 Spotify Recommendations for Oxxxymiron

Here, in Figure 7 we have a graph outlining the recommendations for Oxxxymiron, who has been a very outspoken critic of the war and of the Kremlin leadership. Due to his words against the Russian leadership, he has been exiled from Russia and forbidden from performing there.
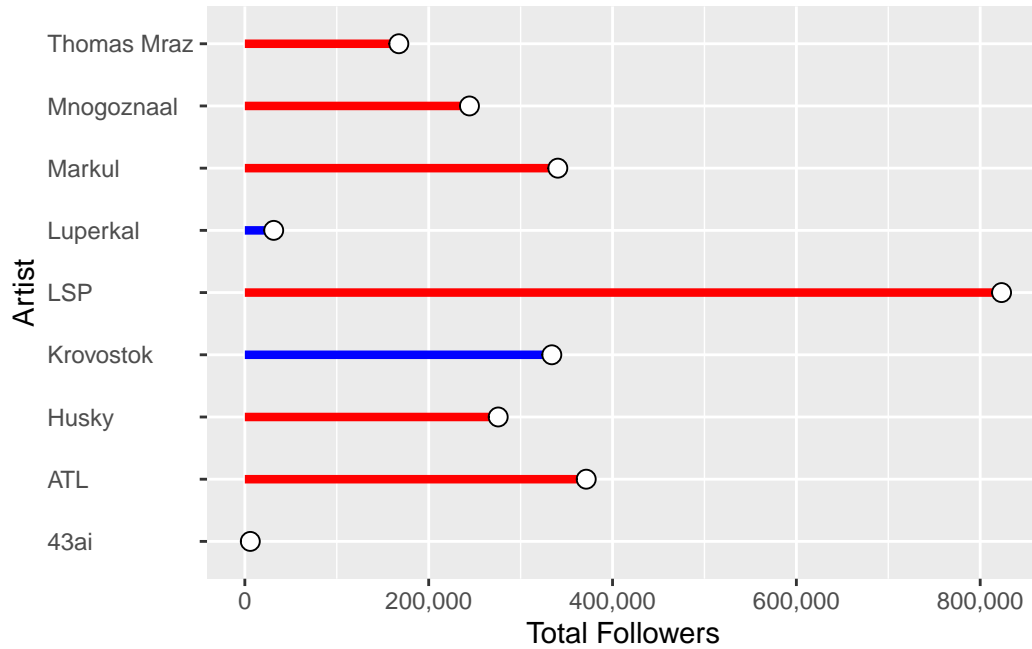

Figure 7: Spotify Recommendations for Oxxxymiron

2.2.6 Spotify Receommendations for Noize MC

Finally, Figure 8 shows the graph for Spotify's recommendations for NOIZE MC, who has also been very outspoken in his support for Ukraine and has since been exiled from Russia.
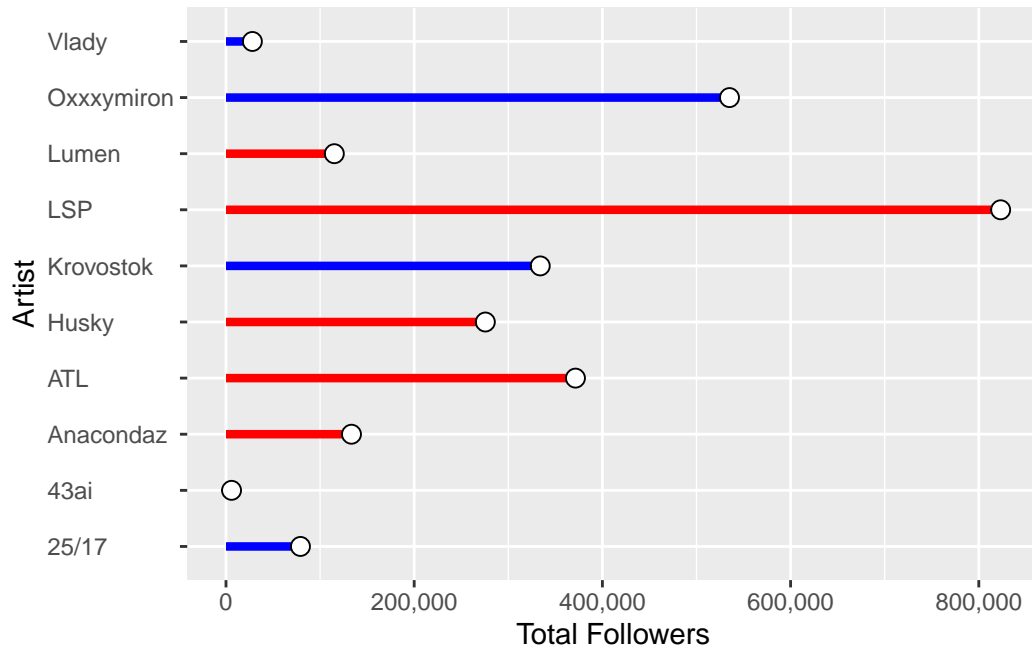

Figure 8: Spotify Recommendations for Noize MC

3 Model

Below is a logistic regressive model that looks at Skryptonite (the most popular pro-Putin artists) and FACE (most popular anti-Kremlin musician), reviewing the top 20 artists that appear as recommendations from Spotify for each artist. A manual analysis was conducted to determine whether a given recommended musician was supportive of the Putin regime or not, with those being deemed pro-Kremlin being assigned a "1" value and those against Putin being assigned "0".

The `data.frame` functions helped to create a data frame with two main columns: One was for artists who are Pro-Russian, called "Pro_Russia" and the other was "Spotify_Recommendations." The Russia column contains binary values indicating whether the artist is pro-Russia (1) or anti-Russia (0), and the recommendations column contains binary values indicating whether the recommended artists are also pro-Russia (1) or anti-Russia (0). Further, the `glm` function works to apply a logistic regression model to the data, with Spotify_Recommendations being thte outcome variable, and Pro_Russia being the predictor variable.

The glm function fits a logistic regression model to the data, with recommendations as the outcome variable and Russia as the predictor variable. The family argument specifies that a binomial distribution should be used, since the outcome variable is binary.

The coef function extracts the coefficients from the fitted model, which represent the log odds of being recommended pro-Russia artists given that an artist is pro-Russia (compared to being anti-Russia).

The exp(coef(model)) code finds the exponentiated coefficients, which represent the odds ratios of being recommended pro-Russia artists given that an artist is pro-Russia (compared to being anti-Russia).

```
 (Intercept)       Russia
8.545354e+08 6.631283e-09
```

4 Results

There are several key results that can be gleaned from the above visualizations. First, as Figure 1 and Figure 2 show, we can see that the pro-Kremlin artists (who are outlined in red) and the anti-Kremlin artists (in blue) do not have huge differences in popularity among Spotify users. We can see that Skryptonite, the Russian rapper is among the most openly supportive of the Putin regime, ranks as the most popular, though by a very small margin. The least popular artist appears to be Oxxxymiron, who has been incredibly vocal about being against the war in Ukraine, and has since been banned within Russia and forced to leave the country.

Next, Figure 2 looks at the correlation between total follower counts and the popularity number assigned by Spotify. What can be seen in this graph is that, as with (**fig_popularity?**), staunchly pro-Putin rapper Skryptonite has the most amount of followers and the highest popularity score. Noize MC, who is ardently anti-Putin, has both the lowest popularity rating and lowest amount of followers. Interestingly, Oxxxymiron and Eldzhey, who are on very opposite ends of the political spectrum, ranked very close in both popularity and follower count.

5 Discussion

This section will offer a summary and discussion of the main findings that emerged out of this project.

5.1 First Finding:

The first finding, as outlined in Figure 1 is that the political affilation of a certain artist does not seem to impact their popularity among listeners. In using the

5.2 Second Finding:

Next, the second main finding is that, while the model's numbers are not statistically significant, reviewing the actual artists demonstrates that Spotify is encouraging engagement with pro-Russian musicians on the platform through its recommendations.

5.3 Third Finding:

Finally, another key finding of this paper is that while content-wise, many of the pro-Russian artists produced media that is similar, they did not have a lot of overlap in terms of Spotify's recommendations.

5.4 Project Limitations and Next Steps

5.4.1 Issue with Spotify API

There are number of project limitations that should be considered when reviewing this data. First, the Spotify API posed a lot of issues when it came to accessing certain types of data. When initially setting out to do this project, I intended to track the popularity of Russian and Ukrainian artists on Spotify over the course of the first six months following the Russian

invasion of Ukraine. However, after many attempts, and developing an overly familiarity with all of the functions within the Spotify R package (Charlie Thompson and Wolff 2022), it became apparent that it is not possible to access either an artist's popularity rating, followers number, or monthly listeners number over the course of a specified period of time without the use of a Third-Party software. Had I been successful in this, it would have been interesting to see how and if the popularity of various artists changed over the course of the war, particularly as people continued to make everyday, conscious choices in boycotting products and artists associated with Russia.

Moreover, there is also a function that allows developers to see the popularity of an artist within certain Spotify markets, but it also was difficult to use and hard to actually gain this data. After a lot of trial and error, this paper was able to get a few key variables about artists, but future work in this could seek to review more deeply the question of Russsian and Ukrainian musical popularity over time and analyzing differences within various key markets.

5.4.2 Impact of Personal Biases on Research

In addition, my own personal biases may have played a role in the decision-making process, particularlly as it relates to reviewing the artist's political affiliations.

As mentioned above, the criteria for deciding whether an artist was supportive of the Putin regime or not was based on a review of several factors. First, I analyzed their respective social media pages (namely Facebook, VKontakte, and Instagram) to see if they have posted any statements online about their stance on Russia's invasion of Ukraine or the Putin regime more broadly. If an artist did not have any statements or other symbols of solidarity to Ukraine, I assumed that they were pro-Kremlin, or at the very best, unwilling to use their online platforms to speak out against the regime.

Another factor that I incorporated in this decision-making process was seeing if they had any concerts happening in Russia or if they were performing internationally. This serves as a very telling indicator because most experts say that only artists who are pro-Putin (or at least silently complicit) are still able to perform within Russia without being banned by authorities.

This approach could have led to a false assumption on whether someone was supportive of Putin, because as is well-documented, saying openly critical things of the Russian government poses many personal risks to not only musicians and artists, but ordinary people. In the case of these artists, many of whom have very large followings, to speak out against the Kremlin would mean that they would likely be threatened by local authorities and often be forced out of the country.

Moreover, Russia's censorship agency, the Roskomnadzor, actively works to censor and ban music produced by oppositionist figures. Since a vast majority of their listeners tend to be

Russian speakers, to speak against the Kremlin may also mean a large loss of revenue for artists. As such, the binary definition of being pro- or anti-Kremlin does not take into account

While I attempt to cross reference various indicators of political affilation, there is inevitably room for error in this approach.

5.4.3 Spotify Ban in Russia

Another important point to note is that Spotify has been banned in Russia and the company has stopped all of its operations within the country in March 2022. While it is difficult to know how many people within Russia are using VPNs to circumvent government bans and access Spotify, this paper does not address how and if the ban has impacted Russian artist popularity since the start of the ban (largely due to the aforementioned reasons).

Regardless, it is important to note that the ban must have played some kind of role in their popularity, as not all people are able to use VPNs to gain access to Spotify within Russia. Moreover, while this seems to be related to privacy issues, the Spotify API does not allow developers to access demographic data of a certain artist's listeners. This data would have provided invaluable insights, particularly in showing which countries have the most users actively listening to either pro- or anti-Kremlin artists.

This data could then be tied to larger ideas on the proliferation of Russian disinformation around the world, and could offer valuable insights into the impact and permeation of pro-Kremlin narratives, and how they translate into individual's musical preferences and choices.

5.4.4 Next Steps and Future Potential Projects

Regarding next steps, there are many possible avenues that could be further explored in this topic. Most notably, the temporal aspect of the data would be very valuable in showing how, regardless of an artist's political affiliations, how the war has impacted this would offer insights into the power of personal decisions to boycott, and the impact of the international moment

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