

**(Im)personally Curated: How Spotify's Music Recommendation Algorithms Shape Users  
and What They Listen To**

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On my honor as a University Student, I have neither given nor received unauthorized aid on this  
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## Introduction

Algorithms are constantly influencing and making decisions for us: the results we see on a Google search, the posts we look at on Facebook, the videos we watch on YouTube, the music we listen to on Spotify. If we think about it intentionally, we realize this is happening. But usually, these algorithms fade into the background. A Google search seems like a service which gives us a result that is a direct function of what we entered. Scrolling through Facebook appears as if we have chosen what is in the feed. YouTube and Spotify seem to give us more content like what we have watched or listened to before. We also know there is a lot more going on behind the scenes we don't understand. And what is happening behind the scenes is not an unbiased and objective system, but a socio-technical system that is the result of many people's work and social contexts (Bijker et al., 1987).

Out of the platforms mentioned, Spotify may seem to have the least potential for negative impacts. Unlike Facebook's role in political radicalization (Vaidhyanathan, 2022), Spotify is often viewed as simply a service that makes all music widely available with little social ramifications. The main areas Spotify has received negative public attention have to do with artist pay and podcast content censorship, but the effects of their recommendation algorithms are rarely in discussion (Brown, 2022; Kornhaber, 2022). With more than 500 million users in more than 180 markets in 2023 (*Spotify — About Spotify*, n.d.), these algorithms must not only have effects on individuals, but on global culture as well. So, this research will look at how the recommendation algorithms of Spotify are affecting users and shaping culture.

The notable results are impacts on what users listen to and how they see themselves. While Spotify and other streaming services offer nearly unlimited content, the trends of diversity in listening have not followed suit. In many areas like the top charts, the opposite has happened

and the superstar economy has been maintained (Syed, 2020; Born et al., 2021). In addition to the types of music listened to, the algorithms and the platform reinforce a distinct vision of their users as happy, individualist, and entrepreneurial consumers with individualistic identities demonstrated through music listening. This vision affects how users relate to music and see themselves. Whether desirable or not, these results are present in Spotify's platform and music recommendations today.

## Music Streaming: A Brief History

Music hasn't always been streamed, and for most of history the only way to listen to music was to be there when it was performed. Thomas Edison created the phonograph in 1877 which could play a recording once with poor quality (*How Listening to Music Has Changed - CBBC Newsround*, 2014). Soon enough recording and listening technologies became more common: vinyl record players in 1930, cassette tapes in 1963, CDs in 1982. Through these technologies, the songs were accessed through physical means and purchased intentionally. But alongside them, radio, which began on a large scale in the 1950s, served as a platform for listening to music without direct choice (Weisbard, 2015). In the age of computers and the internet, music began to become available digitally, with the first major label song released for exclusive download in 1994 (Schiff, 2014). The iPod came out in 2001, moving the digital music world to small mobile devices. But digital music had a problem: illegal file sharing. Companies like Napster created the ability for people to share song files with one another in a massively searchable way. Though they shut down in 2001, the demand for unlimited access to recorded music remained.

Released as a product in 2008, the creators of Spotify saw an opportunity to innovate: capture the demand for illegal file sharing in a legal way. They, along with other streaming

services, started providing access to unlimited content, paid for by advertisements or subscription. Massø and Spilker call this the “Unlimited-Access Phase”, when streaming services primarily were seen as valuable because they were both legal and convenient (2022, p. 302). Users eventually had difficulty navigating the unlimited amount of content, so streaming services had difficulty differentiating themselves. This led to a focus on social features like following users and sharing playlists. This shift echoes the success of Facebook at the time with its social focus. Though with high promise, given the social media culture, the features weren’t as appreciated and widely used as the services had hoped (Maasø & Spilker, 2022, p. 302-303). This gave demand and opportunity to the current phase of music streaming which has a high focus on curation of content through algorithms, much like Facebook and other internet platforms (Maasø & Spilker, 2022, p. 303).

## Methodology and Theoretical Framework

The primary research method of this paper will be through literature review. There is already a significant body of scholarly knowledge around streaming services, user listening patterns, and algorithmic recommendations. Given the higher-level nature of this analysis, specific studies would be difficult to design to capture the breadth of the topic. However, there are data sets available, like the top 100 charts since 1958, that have already been analyzed which will provide helpful quantitative backing. Along with the literature review is observation of the Spotify platform. This may seem obvious, but using and taking examples from the software platform itself serves as a constant check on the results of scholarly research. The importance of observation in this research is exaggerated by the transient nature of software.

The role that observation plays in the research makes actor-network theory (ANT) a fitting framework (Latour, 1996). Actor-network theory looks at socio-technical systems (and the

whole world) through the lens of actors and their relationships to one another. It is unique from other similar theories because it treats all actors with equal importance and allows for nonhuman actors. The allowance for nonhuman actors is key for this research because of the importance of the algorithms. While humans have designed these algorithms, they operate without humans and have their own intricacies and roles which they play.

## How People Use Spotify

In order to understand the effects of Spotify’s recommendation algorithms, we first must know how Spotify is used. Fuentes et al. describe the way many users listen to music streaming services today as “soundtracking” (2019). This term does a great job of capturing the way that music is often used as accompaniment to everyday practices like driving, running, and working. In their study, they interviewed 15 Swedish customers from varying age groups and asked questions about what they do when listening to music. Out of 101 situations mentioned, 88 of them were “dispersed” – listening where the music is not the focus of the activity. Spotify has even utilized this term; on one occurrence of my personal use of the platform, a pop-up was shown at the top of the home screen that said “We’ve soundtracked 2445 of your days. Keep listening your way with this personalized suite of content made just for you” (Figure 1).

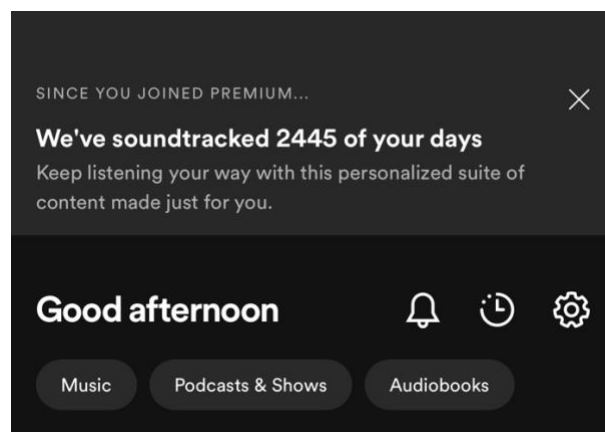


Figure 1: Screenshot of a pop-up on the Spotify mobile app on February 7<sup>th</sup>, 2023

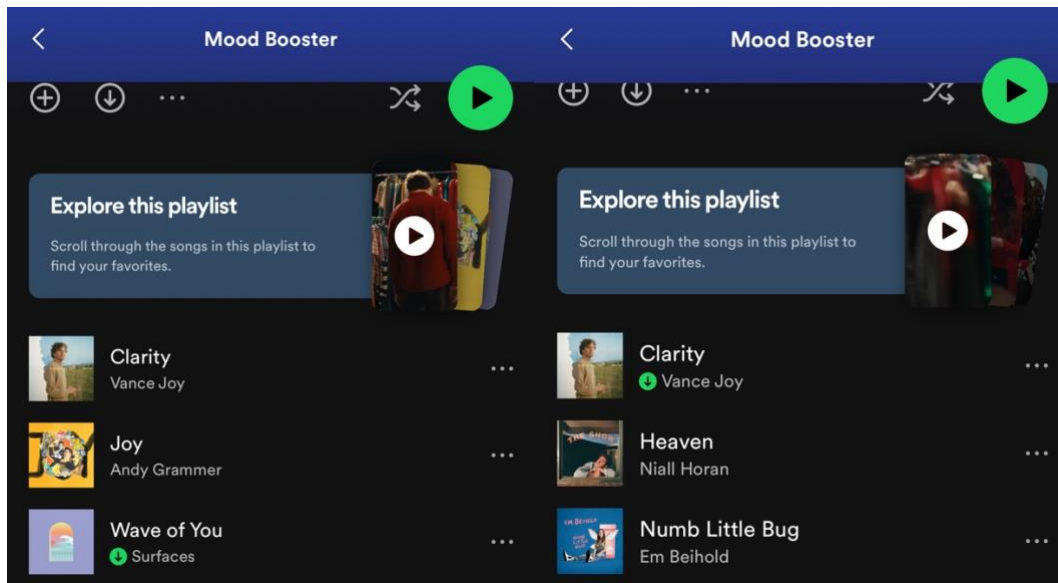
The use of music as a soundtrack means that it is often consumed as an aid to something else, rather than focused on for its artistic intent. Spotify, along with its competitors, has capitalized on this understanding with its recommendations, most notably in the form of mood-based playlists. This emphasizes a bigger trend that streaming services have used to differentiate themselves for years: the curation of content. Morris and Powers show that mood and feelings are key attributes that streaming services use to curate the content in ways that users relate to (2015).



Figure 2: Spotify's Curated "Mood Booster" Playlist

This draws attention to another essential aspect of listening to music on Spotify: the playlist. The playlist takes a nearly unlimited collection of music and makes it actionable and manageable. Playlists play a large role in making songs popular, and this is well known by artists trying to increase their streams (*How to Get More Streams on Spotify in 2023*, 2023). Though they are a nearly ubiquitous means of consuming music on the platform, not all playlists are created equal. The Spotify curated playlists often have millions of follows and listens and how these playlists are created is not transparent. Spotify seems to have two kinds of playlists; the first is the same for all users and curated by people (likely a mix of humans and algorithms) and

the second is generated for each user, often at fixed intervals. Though these seem to be two distinctions, Spotify intentionally does not make this clear and typically will have algorithmic recommendations embedded in playlists that seem at first glance to be generalized. An example of this is the “Mood Booster” playlist, which at first glance seemed to be created for everyone with the same songs, but when compared to another user, have different content.



*Figure 3: Two "Mood Booster" Playlist Contents for Different Users*

Though playlists seems like clear and contained units, the details of how they come to be and the intentions behind them make them great example of a black box (in ANT) or what Eriksson calls a “container technology” (2020). While Spotify has put effort into maintaining that playlists are dependable and transparent, Eriksson shows there is more behind the scenes. Spotify is partially owned by major record labels like Sony, Warner, and Universal, which have a vested interest in their songs getting streamed. A great example is the editorial playlist ‘RapCaviar’ which had 80 percent of the songs owned by one of the three labels (Nelson, 2018). Though it is difficult to show, it is likely that similar biases might be seen in playlists like “New

Music Friday” and “Release Radar” which can’t give all new music or releases – the algorithms are choosing and doing so based on some sort of decision criteria.

## Spotify’s Conception of a Person

The designers of the algorithms, and by extension the algorithms themselves, have a particular way of envisioning individuals. This vision is necessary to create algorithms they believe will be useful to the consumer. Thus, the workings of the algorithms and their view of the user are necessarily intertwined and an understanding of the effects of the algorithms must coincide with an understanding of their view of the user. Ultimately, this view of the user is not only descriptive of the service, but also prescriptive to the users – changing how consumers see music listening. I argue that Spotify sees its users as happy, individualist, and entrepreneurial consumers with individualistic identities demonstrated through music listening which can be seen in Spotify’s marketing and the platform itself.



*Figure 4: The Central Image on Spotify's "About Spotify" Page (Spotify — About Spotify, n.d.)*

On Spotify’s “About Spotify” page they feature a young, presumably middle-class woman with athletic clothes on listening to music inside of a literal bubble alone on the streets of



a European city. This emphasizes all these characteristics of their view of a person, especially focusing on individualism with the bubble around the user. Spotify views music listening as primarily an individual activity; while listening to music with friends is certainly not foreign to Spotify, that is not the focus of the platform or the algorithms. This view of a person is not only present in Spotify's marketing, but on the platform itself. While it is likely embedded into the algorithms themselves, Eriksson et al. (2019) point out this view in curated playlist titles focused on happiness as the users' goal. Take the playlist in Figure 2 with the subtitle "Get happy with today's dose of feel-good songs!", or Good Vibes – "Set it off with these epic anthems. Only good vibes here!", or Stay in Bed – "Where everything is lovely and snuggly <3". And while they do have some sad playlists like idk. – "We hear you." or Sad Bops – "For all of us dancing on our own.", many of the sad playlists also reinforce that they can fix the users' problems like Alone Again – "Being alone (again) can be tough, but these songs will keep you company." or Sad Hour – "Somehow even heartbreak feels good in a place like this."

This generalized vision of the user is not enough for the algorithms to suggest music. Because the recommendations are individualized, the algorithms have specific ways of understanding different aspects of a music-listening individual. Prey (2018) uses the theory of individuation to analyze how Spotify's algorithms do this. Spotify constructs the individual using their actions on the platform: liked songs, listening times, skips, and likely more. They use this to build what they call a "taste profile" which develops over time (Heath, 2015). And to make the recommendations, they focus on the context of the user, from location to emotional state (Prey, 2018). Ajay Kalia from Spotify said "We believe that it's important to recognize that a single music listener is usually many listeners" (Heath, 2015). This is evident in Spotify's "Daily Mix"

playlists which refresh every day and are grouped based on different areas of your music taste (*How Your Daily Mix “Just Gets You,”* 2018).

These views of the individual do more than provide a framework for music suggestion: they affect how users see themselves. Because of music’s affective nature, if the way the music is packaged reflects values of individualism, happiness, and consumerism, the subconscious nature of the “soundtracking” will seep into the imagination of the users, especially if the users see Spotify as a technological platform divorced of its social realities. The effect of viewing identity based on listening habits also promotes the idea that taste evolves slowly and through small, incremental decisions. As Born et al., (2021) recognizes, this model does not allow for unpredictable changes in direction in listening habits which make it much more difficult to change one’s listening habits. Thus, listening to new music requires explicit choice and effort as the algorithms assume that the user wants variations on the same content which makes up his or her identity.

## Diversity in Listening

This understanding of the individual is a part of what affects the music that is pushed by Spotify and listened to by its users. Another is the algorithms’ understanding of the music itself. Yet another factor in what Spotify’s algorithms promote is likely their status as a for-profit company. These all play roles in an unexpected trend: that even with recommendation algorithms and unlimited access to music to help users explore new music they might not find on their own, diversity of music listening doesn’t seem to have increased. Here I will focus on diversity in “whose and which music is made visible and audible”, as Born et al. (2021) use as a portion of their definition in their dissection of diversity in music listening.

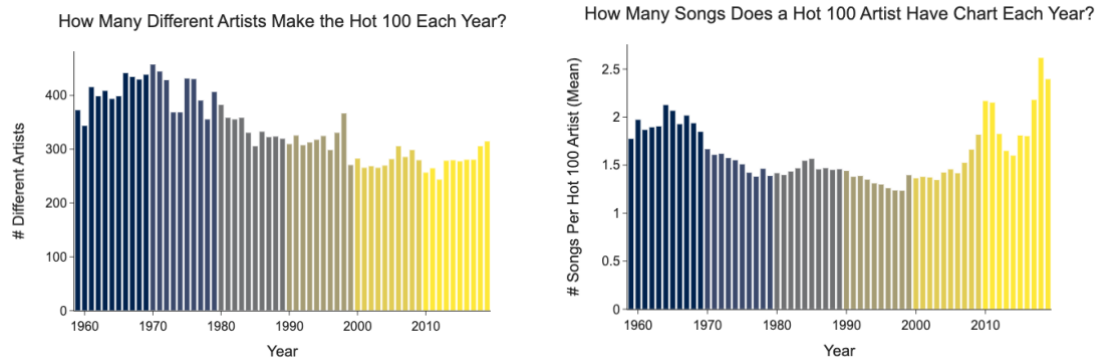


Figure 5: Hot 100 Songs Over Time

Azhad Syed (2020) analyzed every week of the Hot 100 songs since 1958 and created two important visuals, seen in Figure 5. Since the mid-1960s the number of different artists in the Hot 100 has generally declined over time and the mean number of songs of a Hot 100 artist has generally increased since the late 1990s. Maasø & Spilker (2022) call this the “streaming paradox”. Algorithms’ failure to diversify music listening is partially how they understand music itself and how they promote music for profit.

Music is universal, but what makes “good music” is not. Music informatics research is a field that dissects music into components and features like BPM, key, and tempo. While these are helpful characteristics, they certainly miss what’s at the heart of music. Born et al. (2021) point out that this field doesn’t appear to have developed closely with fields like ethnomusicology, musicology, music sociology, and music analysis which take more qualitative approaches to music. Spotify doesn’t treat the features extracted from music informatics as the only relevant ones, which is clear in their collaborative filtering which includes others’ listening habits into recommendations, but songs with consistent and identifiable features make them easier to categorize and commoditize. Songs on the top charts tend to have features that align well with western ideas of music as opposed to, for example, non-western computer music which

focuses on aspects like “timbre, gesture, microtonality, spatialization, and other rhythmic subtelties” (Born et al., 2021).

Another way the algorithms reduce the diversity of listening is because of the profit motivations of Spotify. As noted previously, the three main record labels own stakes in Spotify and have incentive to promote their own music, and Spotify has intentional ways of doing so (Eriksson et al., 2019). Maasø & Spilker (2022) find four ways that music streaming services shape what their users listen to: front boosting, which involves displaying certain music more prominently on the platform; novelty boosting, which invites users to explore new music rather than old personal music; choice narrowing, which is the intentional curation of content; and flow prolonging, which keeps users from making decisions and relying on autoplay. The results of the Hot 100 are an indicator that the way that Spotify is pushing certain music through these means is not increasing the diversity of music listening as expected.

## Conclusion

This research examined how the recommendation algorithms of Spotify are affecting users and music culture. The key effects are twofold: Spotify and its music recommendation algorithms are affecting how users see themselves and the diversity of what they listen to. Because of the algorithms’ views of users as individualistic, happy, and consumerist they subconsciously affect the way users view themselves. And the way the algorithms understand “taste” affects users’ ability to change preferences in unforeseen directions. Additionally, the algorithms have not had positive effects on diversity of music listening but may actively decrease it. These results are a product of the current scholarly research on music streaming and recommendation algorithms as well as observation of Spotify’s platform.

This is just one example of the effects of algorithms and algorithmic suggestions, which continue to play larger and larger roles in society. An essential component of moving forward is seeing these algorithms as part of larger socio-technical systems. Either end of the extremes of embracing algorithms is problematic; an unquestioning embrace of algorithmic suggestions functionally takes away our autonomy and personhood, but a full-scale rejection of algorithmic suggestions robs us of the many benefits we can receive from them. For Spotify and music recommendation systems specifically, part of users receiving the benefits involves some skepticism that the algorithms are merely an extension of their desires. It would serve users well to treat Spotify as a part of their music listening and not the whole. So, explore music outside of Spotify, talk about music with other people, intentionally explore parts of the Spotify app you haven't before, make your own playlists, and appreciate Spotify's playlists for what they are: algorithmically generated and not personally curated.

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