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LINGUISTIC IMPERIALISM IN THE SPOTIFY ERA

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This Thesis is not a mere academic exercise but the culmination of a memorable academic adventure, and I would like to thank everyone that has been a part of it.
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"We should be concerned about the loss of cultural diversity for the same reason that biologists worry about the loss of biodiversity: we don't yet know what the loss will mean, but we do know that the loss will be irreversible."

(Huron, 2004)

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Executive Summary

A digital world is no longer a mirage but a new reality. Technology is present and actively influencing every dimension of our lives, including music. With more than 159 million European users and a library of over 100 million songs, Spotify has emerged as a dominant force in the music industry that massively shapes musical tastes and consumption habits. The new digital music paradigm brings a democratization of the music industry that opens the possibilities for consumers and artists to transcend geographical boundaries, making music more accessible than ever before. However, this increased accessibility also exposes music to the complex forces of globalization, raising questions about the preservation of a critical aspect of cultural identity: the national languages.

This Master's Thesis investigates the impact of Spotify's emergence on the consumption of national language music in Europe. By analyzing national language presence in Spotify's European music charts and commercial charts until 2023, the research assesses how trends have evolved within the Spotify context and beyond the platform. Additionally, the perceptions of European Spotify users are examined to gain a qualitative understanding of the phenomenon, corroborating the quantitative data. A rigorous methodological approach is employed to gather both quantitative and qualitative data, generating robust insights that are meticulously analyzed in conjunction with the existing academic literature and framed within the theoretical lenses of Cultural Globalization and Algorithmic Bias.

The resulting findings reveal that Spotify's emergence has significantly impacted the consumption of national language music in Europe, fostering a glocalized landscape where global languages like English and Spanish remain dominant in the global charts while national languages are experiencing a resurgence in local markets. This positive impact is reflected in increased chart presence, popularity, and revenue for national language music. However, user perceptions often diverge from this reality, highlighting a disconnect between the broader positive impact and individual listening experiences.

Collectively, the content of this work presents that the democratization of music consumption through Spotify has created a more favorable environment for national language music, challenging the traditional narrative of cultural homogenization in favor of a "transcultural" environment where global and local influences coexist and interact.

1. Introduction

In the 21st-century symphony, where the melodies are digital, and Spotify conducts a global orchestra, music echoes with a haunting question: Can the whispers of national languages survive the algorithmic cacophony?

As the world pulses with the rhythms of globalization, the delicate equilibrium between mainstream appeal and linguistic diversity hangs precariously in the balance. With each click, each play, each skip, Spotify learns, adapts, and shapes the musical landscape, potentially amplifying dominant voices while relegating others to the margins. But in the middle of this algorithmic cacophony, a glimmer of hope remains: the potential for technology to become a bridge, not a barrier, between cultures.

Drawing upon the theoretical frameworks of cultural globalization and algorithmic bias, this thesis embarks on a sonic journey that traverses the boundaries of language, culture, and technology. Through meticulous analysis of Spotify's charts and radio airplay, this work traces the ebb and flow of national language music, seeking to discern patterns and anomalies that reveal the algorithm's hidden biases. But charts alone cannot capture the nuances of lived experience. Thus, users' voices will join the numbers on stage, inviting them to share their perceptions of fairness and equity in the algorithmic music realm.

This thesis is not merely an academic exercise but a cultural exploration, a quest to understand how technology shapes our musical experiences and, in turn, our shared cultural heritage. It is an invitation to listen - truly listen - to the diverse voices within our global music landscape, guiding us toward a more inclusive and equitable musical ecosystem where every voice, every melody, and every cultural expression finds its rightful place in the grand tapestry of human creativity.

1.1. Key Concepts

Before diving into the contents of this research, this section will present the definition of key concepts to keep in mind for a complete understanding of this thesis. In the first place, it will be crucial to understand the concept of *national languages* as this concept does not have a standardized definition in the academic context. In the context of this research, a national language will be the language recognized as official in a certain nation, providing an easy distinction between the languages that are local to any nation analyzed in this study. It is

crucial to note that this definition is context-dependent, as a language may hold national status in one country but not another. For the purposes of this research, “national language music” will refer to the music whose lyrics are in those languages.

Additionally, the reader of this thesis should clearly understand the definition of *commercial charts* and their difference from the Spotify charts. While the latter include the top-played songs for a certain period and nation on Spotify, commercial charts refer to the charts made by commercial channels and crafted by radio airplay, streaming, and sales numbers. By distinguishing both concepts, it will be possible to compare both charts and asses any difference between the charts of Spotify - a platform where an algorithmic recommender system guides autonomous music consumption - and the charts of commercial channels - less influenced by algorithmic systems as they focus on radio and sales numbers.

1.2. Background and Context

Digital music streaming platforms have revolutionized the music industry, transforming how we consume music and reshaping the relationship between artists and their audiences. As of 2024, music streaming accounts for 84% of total music industry revenue - with a 10% growth over the last year (Durrani, 2024; IFPI, 2023). The actual dominance of music streaming is the result of a shift that started with the introduction and popularization of music streaming platforms. As evidence, revenue from music streaming has grown year over year since the mid-2000s, and between 2010 and 2020, this revenue increased by around 34x from $0.4 billion to $13.6 billion (IFPI, 2023). However, this dominance goes beyond revenue figures and extends to the user dimension. Nowadays, around 4 in 5 people listen to music using a streaming service, and since 2015, the number of music streaming subscribers has increased by around 10x (IFPI, 2023; Mulligan, 2022).

Among the newcomers in the music streaming sector, Spotify is leading the market share race. The Swedish company is dominating the music streaming space with a 31.7% market share - as of Q3 2023. This means that, among the 713.4 million people with a music streaming subscription, 226 million are subscribed to Spotify (Tadesse, 2024). Since 2015, Spotify has increased its number of regular and premium users every year. And in Q3 2023, the music streaming service reached an all-time high with 602 million active users worldwide - an increase of over 110 million users in just one year (see Figure 1) (Spotify, 2024c). By controlling market and subscriber shares, Spotify has had a crucial impact on music

consumption over the last decade, and besides an unexpected setback, this dominance will continue in the foreseeable future.

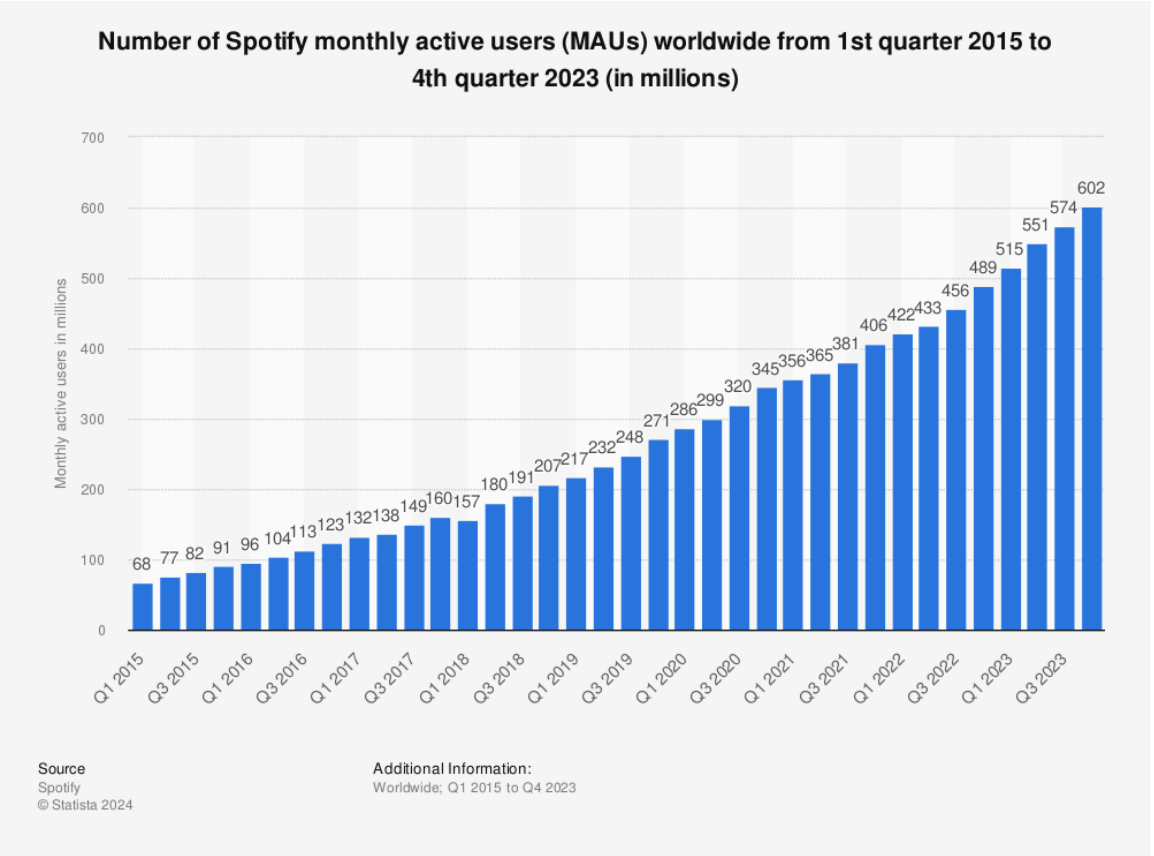

Figure 1: Evolution of Spotify monthly active users worldwide (Statista, 2024).

However, this shift hasn't happened in isolation. It has been accompanied by an accelerating globalization of culture fueled by the interconnectedness of our digital age. Together, these forces have created a dynamic and multifaceted cultural landscape where the interplay between majority and minority cultures is constantly evolving.

Historically, the relationship between dominant and marginalized cultures has been a subject of great interest and debate. Early theories of cultural imperialism, for example, explored how powerful nations exerted influence over colonized territories, not only politically but also culturally. In the latter half of the 20th century, concepts like the Americanization of global culture and linguistic imperialism became central to cultural studies as a result of the endangerment, sometimes fatal, that minority cultures and languages have suffered from the start of globalization.

Moreover, the threat of language colonialism, rather than disappearing, is becoming even more menacing today. The United States was once home to 280 languages before European colonization, but now half of them have no native speakers left. Of the surviving languages,

119 are critically endangered, and only a few are expected to be passed down to the next generation (Mitchinson, 2020). While the traditional form of colonialism is fading away, new ways of colonialism are taking over in the modern era, shaping a hopeless reality for minority languages. Globally, out of 420 known language families, a quarter have disappeared entirely, with 90% of those vanishing in the last 60 years alone. Of the 7,011 languages currently spoken, 2,895 (41%) are now endangered, each with less than 1,000 speakers remaining (Mitchinson, 2020). The future does not look any brighter. According to McVeigh (2023), a language dies every 40 days and, at this rate, by 2050, it is estimated that 90% of the currently spoken languages will be gone forever.

In the music context, the impact of globalization on the music industry has been profound, with technological advancements transforming production, distribution, and consumption patterns (Baltzis, 2005). In a language key, a study by Achterberg et al. (2011) analyzed the presence of national languages in music charts across Europe and the USA, finding hints of linguistic imperialism, especially before the 1990s. However, the rise of digitalization has made such studies somewhat obsolete, as new digital dynamics and complexities have emerged, demanding fresh investigation.

The digitalization of music takes part in a new era of cultural exchange, often described as "glocalization." This term captures the idea that global trends interact with local cultures, creating a unique blend of influences that leads to increased access to both popular and minority music worldwide and potentially fostering a richer and more diverse cultural landscape. However, the exact impact of digital globalization on cultural diversity is still a hot topic. Some scholars argue it has led to cultural homogenization, others believe it has fostered greater heterogeneity, and a third perspective suggests that a hybridization of cultures has occurred, blending the popularization of majority cultures with the expanded reach of minority cultures (Hassi & Storti, 2012).

Amidst this digital landscape, music streaming platforms have become powerful gatekeepers, influencing what music is consumed through their algorithmic recommendation systems. The integration of Music Recommender Systems (MRSs) has become essential to assist users in effectively browsing large music catalogs. In its Made to be Found report, Spotify (2024a) details that ⅓ of new artist discoveries happen in the Made for You sessions, a group of playlists that are algorithmically crafted based on different factors, including song characteristics and collaborative filtering.

With an undeniable penetration of music recommendation, MRSs have largely replaced human curation, raising concerns about potential biases and their impact on cultural representation. Extensive research has been conducted on algorithmic biases, proving unfairness in multiple sectors, including media. In the MRS context, this unfairness usually takes the form of popularity bias. Specifically, algorithmic recommendation of music follows a long-tail distribution where a small amount of extremely popular content gets recommended the most and where the long-tail of less-popular artists is barely recommended (Abdollahpouri et al., 2020; Ekstrand et al., 2018; Kowald et al., 2019; Lesota et al., 2021).

Faced with this complex panorama formed by the expansion of digital globalization, the threat of linguistic imperialism, and the growing importance of algorithmic recommendation, this thesis is contextualized in the subject that is the cornerstone of all these topics: minority language music.

1.3. Problem Statement

The growing dominance of music streaming platforms and the ongoing globalization of culture have created a complex and uncertain landscape for minority language music. On one hand, the global reach of these platforms offers unprecedented opportunities for minority language artists to share their music with a worldwide audience. On the other hand, the same forces of globalization could potentially marginalize these artists as they compete with the overwhelming popularity of mainstream music. While globalization has facilitated the dissemination of diverse cultures, it has also been accused of promoting cultural homogenization. Accordingly, The "3H scenario" (Hassi & Storti, 2012) suggests that globalization can lead to homogenization, heterogenization, or hybridization of cultures. This open scenario makes it difficult to predict the exact impact of globalization and music streaming on minority language music, creating an uncertainty that must be addressed.

Existing research has explored the impact of music recommender systems (MRS) on popular and unpopular content suggestions, but the specific challenges faced by minority languages in the music context remain largely unaddressed. While Achterberg et al. (2011) examined the presence of national languages in American, Dutch, French, and German music charts, their study dates from before the current era of music streaming and algorithmic recommendation. Therefore, their findings may not accurately reflect the current situation. Also, when tackling the problem of algorithmic bias, academic work tends to measure fairness only on a numeric

basis. However, as music diversity is by and for the listener, it will be necessary to include the music consumer perception in any complete assessment of minority language music fairness.

This lack of research is particularly concerning given the deep cultural significance of minority language music. Music is not just an art form; it's an expression of identity that is often intertwined with languages. Therefore, studying the situation of minority language music in the RecSys era is caring about the preservation of human identity towards the threats posed by a digitally globalized reality. Among the threats, the potential marginalization of music in minority languages is particularly worrying as it could have far-reaching consequences for cultural diversity, leading to a massive language extinction and, with them, unique ways to see the world.

Therefore, this work will focus on confronting this culturally crucial research gap on the complex situation of minority language music in music recommender systems from a numeric and perceptive point of view.

1.4. Research Objectives

After describing the background and challenges that this research faces, it is time to define the objective of this work. Naturally, this research seeks to fill a research gap by understanding how music streaming platforms shape the consumption of minority language music. However, the knowledge gap that this work intends to fill is of such complexity that it is impossible to establish a causal relationship among the many agents that form it or define specific causes and consequences of the obtained results.

Another challenge that this research faces is the definition of minority language music due to the lack of a universal definition, often leading to inconsistencies and arbitrary distinctions between minority and majority languages. Given these challenges, this research will instead focus on the distinction between national and foreign languages. National languages will be defined as the official languages of each European nation. This simplified approach (thoroughly detailed in the Methodology section) will allow the study to assess national language music consumption in the face of potential linguistic colonialism from globalized music platforms while presenting the global-local interplay reality in the music streaming context.

On the one hand, the research will be contextualized on Spotify as it is the music streaming platform with the biggest number of users and offers a better data retrieval service. However,

Spotify's recommender system is a black box for this research. It is impossible to have a detailed vision of how it works, and only very general knowledge of its functioning has been gathered using the scarce information released by Spotify. Therefore, this research will not aim to define bias metrics on how Spotify is crafting national language music recommendations. On the other hand, in addition to algorithmic bias, there are multiple factors that can influence the recommendation of music in national languages, such as specific cultural trends or commercial reasons. Therefore, it will be extremely challenging to prove that a certain national language music consumption trend is due to Spotify's recommendation system.

The complex background of this work makes it challenging to define a hypothesis that covers the entire context and establishes causal relationships between Spotify's recommendation system and the consumption of national language music. Instead, these challenges will be tackled by taking an explorative approach. Consequently, this work aims to show the past and present situation of music consumption in national languages as it is, without any type of prior assumptions that could condition the direction of the research.

Additionally, to reduce the complexity of the research even further, the scope of the study will be limited to Europe. This way, it will be possible able to contextualize the analysis of the results in a more uniform environment than if the scope were global, limiting the influence of cultural differences on data disparities and, consequently, making the Spotify impact more observable.

In order to achieve these objectives, this research will aim to answer the following research question:

RQ1: How has the emergence of Spotify impacted the consumption of national language music in Europe?

However, as the scope of this question may be too broad to be precisely answered, it will be divided into two subquestions to provide an in-depth analysis of Spotify's numeric and perceived impact on national language music consumption.

In the first place, the numerical impact will be assessed through an analysis of the presence of minority language music in European charts over the years. By comparing the presence trend found in the Spotify charts with the one found in radio station charts, it will be possible to appreciate the general trend evolution and how the irruption of Spotify affected this trend. The first research subquestion will cover this intention:

RQ1.1: How has the emergence of Spotify affected the presence of national language music in European charts?

In the second place, this research will also capture the perception of the European Spotify user. This way, it is possible to discover qualitative insights about how the same music consumers who might be affected by the threats of globalization perceive the consumption of national language music within Spotify. Therefore, the second research subquestion will be:

RQ1.2: How do European Spotify users perceive the impact of Spotify on the national language music consumption?

With this double perspective provided by the two research subquestions, this work will generate a knowledge base robust enough to resolve the main research question, with a special interest in analyzing whether the numerical situation of music consumption in national languages coincides with the users' perception.

Therefore, this research aims to illuminate the current situation of national language music in the era of Spotify. For that purpose, the statistical impact of Spotify on national language music will be measured to solve the first research subquestion. The users' perception of that impact will be analyzed to answer the second research subquestion. With both insights, it will be possible to assess if Spotify's irruption in the music market might be either homogenizing, diversifying, or hybridizing musical culture, providing a relevant answer to the main research question.

1.5. Relevance

The exploration of national language music within Spotify's digital landscape holds profound relevance that extends beyond academic curiosity. It encompasses practical implications for various stakeholders, societal contributions, and theoretical significance.

Firstly, this study's findings will be directly relevant to the music industry, streaming platforms, and cultural organizations. By understanding the factors influencing the visibility and consumption of national language music, these stakeholders can develop informed strategies to promote cultural diversity and ensure equitable representation on digital platforms. Streaming platforms like Spotify can leverage these insights to refine their algorithmic recommendations, potentially fostering a more inclusive and diverse musical landscape where mainstream trends do not overshadow local voices. Furthermore, cultural

organizations and policymakers can utilize this research to advocate for policies that support the preservation and promotion of national language music in the digital age, recognizing its value as a vital component of cultural heritage.

Secondly, the societal implications of this research are far-reaching. Music is a deeply ingrained expression of cultural identity, often inextricably linked to language. In particular, national language music encapsulates the unique perspectives of communities that may not always be represented in mainstream musical discourse. Therefore, by addressing the challenges facing national language music in the digital era, this study contributes to broader discussions on the important topics of cultural preservation and linguistic diversity. The findings could promote efforts to safeguard cultural heritage and ensure that diverse voices are heard and valued, enriching the global cultural scenario.

Finally, this research holds theoretical significance by extending existing frameworks on cultural globalization and algorithmic bias. By examining the specific case of national language music on Spotify, this study contributes to a deeper understanding of how global platforms and algorithms interact with cultural production and consumption, offering new insights into the dynamics of cultural exchange in the digital age and the potential impact of technology on cultural diversity and possibly refining the theoretical reality.

Overall, this research is not only an academic exercise but also a critical investigation with tangible real-world implications. By examining the dynamics of national language music consumption on Spotify, this study contributes valuable insights that can empower stakeholders across the music industry, streaming platforms, cultural organizations, and policy spheres to make informed decisions that foster a more inclusive, diverse, and equitable cultural landscape.

1.6. Structure

Given the significance of these potential outcomes, a clear and rigorous research structure will be essential to ensure that the findings are robust, meaningful, and actionable. Therefore, this thesis follows a structured approach that ensures a logical progression from contextualization to in-depth analysis, fostering a comprehensive understanding of the research topic.

The research will start with an Introduction chapter that establishes the context of the research, outlines its motivation and relevance, and presents the research questions that guide the investigation. This introduction will set the direction of the research.

Following the introduction, the Literature Review and Theoretical Framework chapters will explore the existing academic knowledge on the research topic. A comprehensive literature review will critically examine existing research on cultural globalization, algorithmic bias, music streaming platforms, and national language music. This review will provide a robust foundation for understanding the current research landscape and identifying gaps that the present study aims to address. Subsequently, a chapter on the theoretical framework will establish the theoretical underpinnings of the research. By reviewing the theories of cultural globalization and algorithmic bias, this section will create a systematic framework that enables a comprehensive analysis of the literature review insights and the empirical findings. This framework provides a lens through which the data can be interpreted and understood within a broader theoretical context.

At the same time, the Methodology chapter will outline the research design and approach, detailing the quantitative and qualitative methods employed for data collection and analysis. This includes a thorough justification of the choices made in the research process, encompassing both music charts and interview data-gathering techniques. The methodological transparency will ensure that the research findings are replicable and can be scrutinized for their validity and reliability.

Following the methodology, the Results and Discussion chapter will contain the findings of this thesis. Firstly, the results chapter will present the empirical findings derived from the data analysis. This section includes the presentation of both quantitative data, such as statistics on the presence of national language music in European charts over time, and qualitative data, such as insights gleaned from interviews with Spotify users. Using the obtained results, the discussion chapter will interpret and analyze these findings in light of the literature review and the theoretical framework, drawing connections between the quantitative and qualitative data and exploring patterns, contradictions, and potential explanations. Therefore, these sections will answer the research questions by providing a comprehensive analysis of the data, ultimately contributing to a deeper understanding of the relationship between national language music and its consumption on Spotify.

Finally, the Conclusion chapter will examine the research from a perspective of perspective while summarizing the key findings and their implications, revisiting the research questions,

and offering a comprehensive answer based on the evidence gathered. This section will also acknowledge the limitations of the research and suggest avenues for future research. The conclusion serves as a final reflection on the significance and potential impact of the study, reinforcing its academic and practical relevance and giving a comprehensive understanding of language colonialism in the Spotify era.

2. Literature Review

In an era defined by rapid technological advancements and increasing interconnectedness, the consumption of music has undergone a profound transformation (Baltzis, 2005). Understanding the dynamics of this transformation necessitates a comprehensive review of existing academic knowledge. This literature review aims to provide a solid foundation for further research by examining the interplay between music, culture, technology, and globalization. By synthesizing scholarly insights from diverse fields, we can identify the precise knowledge gaps in our understanding of music consumption in the digital age. The multidisciplinary nature of this topic necessitates a holistic approach that considers the cultural, social, economic, and technological factors that shape how we discover, consume, and experience music today. Therefore, this review serves as a springboard for this research, enabling us to build upon existing knowledge and address the emerging challenges and opportunities in the realm of music consumption.

2.1. Cultural Globalization

This literature review starts by assessing the academic understanding of the high-level phenomenon framing this research: the globalization process. Globalization is a complex phenomenon that has sparked extensive debate and analysis among scholars from various disciplines. In the realm of cultural globalization, researchers have explored its impact on music, media, and cultural identity.

Early literature on globalization and culture often focused on the concept of cultural imperialism, which viewed Western culture, particularly American culture, as dominant and homogenizing. Schiller's (1976) work is a fitting exponent of this perspective. He argued that American media corporations were responsible for the spread of a singular cultural identity around the globe, potentially marginalizing local traditions and values.

However, with the rise of digital technologies, the academic view recognized a more nuanced understanding of globalization, where cultural exchange is a two-way street, and the global possibilities of technology can also promote the spread of minor forms of culture and allow local cultures to adapt and reinterpret global influences.

Globalization, defined by Yohe et al. (2023) as the increasing interconnectedness and interdependence of the world, has been significantly accelerated by the digital and

information era, presenting both opportunities and challenges for businesses and cultures worldwide, transcending barriers such as language and regulations. However, the authors affirm that for a successful global expansion, companies must understand diverse consumer preferences across different regions to tailor products and services effectively.

Extensive research has examined globalization's impact on cultural products, particularly music. Technological innovations have revolutionized the production and consumption of music, with streaming platforms providing unprecedented access to diverse musical genres from around the world (Way et al., 2020). While globalization has broadened consumers' choices and introduced artists to wider audiences, it has also raised concerns among scholars about the dominance of wealthier countries in global trade and the potential homogenization of cultural products.

The spread of Western dominant cultures - particularly American culture - through mass media and the Internet has been a major concern. Alaminos Fernández (2023) argues that cultural globalization has led to the dissemination of standardized patterns and the mass production of cultural products, potentially homogenizing cultural expressions and values. Specifically, recognized in the academic community as “Americanization”, it has been studied that US-produced material has had a homogenization effect in local cultures worldwide, especially in the production of media such as music (Achterberg et al., 2011; Alaminos Fernández, 2023; Chan, 2011; Jaja, 2010)

Despite the Western influence and increased access to global music, research by Way et al. (2020) has shown that preferences for local content have grown stronger, suggesting that local cultures and identities continue to play a significant role in shaping musical preferences. As a result, the concept of "glocalization" has emerged as a key framework in the academic context for understanding the complex relationship between globalization and culture. Lesota et al. (2022) define globalization as an "expanding cultural exchange between countries" and discuss two interpretations: cultural imperialism, where dominant Western cultures overwhelm others, and glocalization, where local cultures adapt and develop under global influence. Their research on music consumption patterns reveals that while US music maintains a strong presence in many countries, it does not necessarily dominate globally, where local music scenes often coexist and interact with global influences. Fernandez (2009) further emphasizes the importance of glocalization in finding a balance between the global and the local, allowing cultures to absorb enriching influences while resisting those that are truly alien by promoting local cultural consumption.

The debate on the cultural implications of globalization is ongoing, with scholars exploring the tensions between homogenization and heterogenization, cultural imperialism and glocalization, and the role of technology in shaping cultural flows. Garofalo (1993) challenges the simplistic notion of cultural imperialism, arguing that the relationship between local and global cultures is more nuanced and dynamic. The author highlights the importance of considering the internal dynamics of resistance and opposition within local cultures and the active and creative dimension of popular music consumption. Chan (2011) discusses the shifting descriptions of these implications from terms like "imperialism" and introduces the concepts of "homogenization" to "hybridization" and "heterogenization". Matei (2006) proposes a flexible research framework that acknowledges the intensification of connections between nations while also recognizing that these processes unfold differently across various levels, reinforcing a renewed sense of "glocal" identity.

From a technological perspective, extensive research has also discussed how globalization has profoundly impacted the music industry, with technological advancements transforming production, distribution, and consumption patterns. According to Baltzis (2005), the rise of transnational entertainment corporations and the digitalization of music have led to the disorganization of traditional local music distribution systems and raised questions about intellectual property rights and the diversity of musical expressions. However, as Larkey (2008) noted in his analysis of Austrian pop music evolution, globalization has also created opportunities for local cultures to gain global recognition and for new hybrid musical styles to emerge through the interaction of global and local influences.

In conclusion, the literature on cultural globalization presents a complex picture where globalization has undoubtedly led to increased cultural exchange and the emergence of new cultural forms but has also raised concerns about cultural homogenization, the erosion of local cultures, and the dominance of certain cultural forms. The music industry, in particular, serves as an example of these dynamics, reflecting the tensions and opportunities of cultural globalization in the digital age. However, the concept of "glocalization" offers a potential solution to these challenges, emphasizing the adaptation of global cultural forms to local contexts and the importance of maintaining cultural diversity in an increasingly interconnected world.

2.2. Language, Identity, and Music

The increasing interconnectedness of the globalized world has brought about a significant shift in the global cultural landscape, with the English language emerging as a dominant force from the start of the 20th century (Fishman, 2001). This phenomenon, often referred to as linguistic imperialism, has been a subject of extensive scholarly debate.

The dominance of English as a global language has engaged academic discussions about linguistic imperialism, a concept that examines the power dynamics and inequalities associated with language dominance. Phillipson (1992) defines linguistic imperialism as the imposition of a dominant language on other cultures, often through structural and cultural mechanisms. He argues that English, as the global lingua franca, has become a tool of linguistic imperialism, perpetuating inequalities between English and other languages. Zeng et al. (2023) build on Phillipson's work, arguing that linguistic imperialism is still "alive and kicking" and has evolved into a more subtle form in the era of globalization, which they term "linguistic neo-imperialism." This neo-imperialism is characterized by the internalization of the value of the dominant language by the speakers themselves, driven by economic and social motivations.

“Language is integral to cultural identity. It is how humans communicate, express themselves, convey meaning, and get their messages across. It is the medium through which people express their cultures and values” (Hamidi, 2023)

The notorious importance of language lies in its direct influence on cultural identity, which plays a crucial role in shaping individual preferences and behaviors. Ferraro et al. (2023) highlight the concept of cultural citizenship as a response to the social transformations and challenges posed by globalization. Scholars argue that cultural citizenship promotes cultural pluralism, enriching society by recognizing and accepting cultural diversity. This perspective emphasizes the importance of democratic cultural production and distribution channels in curating and disseminating diverse cultural content, such as music.

As recognized in multiple academic works, cultural identity is found in music to be a superb exponent. Song et al. (2012) recognize music as a fundamental aspect of human experience, serving as a universal language that transcends cultural boundaries and connects individuals deeply emotionally. Porcaro et al. (2021) state that music is a heterogeneous mixture of creative processes shaped by diverse historical, cultural, and societal contexts. Additionally,

both authors argue that music diversity is reflected in the wide range of musical genres and styles found across the globe, each with its unique cultural significance and meaning.

The relationship between music and cultural identity is further explored by Lidskog (2016), who discusses the role of music in diaspora communities, highlighting its ability to stabilize and maintain identities and belongings, as well as to destabilize them and provide new material and resources for identity formation. Music can serve as a space and practice that binds group members together, allowing them to understand themselves as belonging to each other and to construct a shared social identity. In order to promote local identities, Grant (2013) discusses the concept of music sustainability, emphasizing the need to safeguard threatened music genres, particularly those of indigenous societies. The author highlights the challenges of maintaining and revitalizing these genres in the face of various local and global processes, such as technological developments, environmental shifts, and economic pressures.

Therefore, music's cultural importance extends beyond its aesthetic and emotional dimensions. Music plays a crucial role in shaping individual and collective identities, particularly in the context of globalization. In line with this idea, Alaminos Fernández (2023) explores the concept of "soft power" in music, highlighting how popular music can promote specific lifestyles and values associated with the culture from which it originates.

As noted by Achterberg et al. (2011), this cultural influence can be seen in the global spread of Western music, particularly American pop music, which has become a dominant force in the international music market. In their work, Achterberg et al. (2011) examined the globalization of popular music by analyzing the top 10 songs from the year-end charts in the United States, the Netherlands, France, and Germany from 1965 to 2006 with the aim to determine whether the consumption of popular music was becoming more globalized, Americanized, glocalized, or diversified. The authors found no evidence of an overall trend toward globalization, as the share of foreign music in each country's charts did not increase over time. However, they did find evidence of Americanization, with American music increasing in popularity in France and Germany until the late 1980s. This trend reversed after 1989, with American music declining in popularity and national music experiencing a resurgence in all three European countries. The authors interpret the resurgence of national music as a form of neo-nationalism or a reaction against American cultural dominance and globalization. They suggest that this trend may be related to geopolitical shifts, such as the end of the Cold War, as well as to broader cultural trends, such as the rise of localism and the desire for cultural authenticity.

Achterberg et al.'s (2011) work has served as a significant inspiration for this thesis, sharing the common goal of measuring national language presence in music charts to assess the threats of language imperialism brought by cultural globalization. However, their study predates the boom of digitalization and the emergence of music streaming platforms like Spotify. Consequently, their results and conclusions are primarily focused on cultural factors and do not consider the influence of digital platforms. While the research of Achterberg et al. (2011) provides a valuable foundation and methodological inspiration, this thesis aims to extend it by incorporating not only cultural factors but also the impact of Spotify on the analysis of national language presence in music charts.

In conclusion, the reviewed literature reveals music's profound impact on cultural identity, shaping individual and collective experiences. Music plays a vital role in our lives, from fostering social cohesion to promoting cultural exchange. As globalization continues to shape our world, understanding the intricate relationship between music and culture is more important than ever. Therefore, the following chapters explore the dynamics of music consumption more deeply, presenting academic knowledge on the role of technology and algorithms in shaping our musical preferences and experiences in the digital age.

2.3. The New Cultural Curators

Recommender systems have become indispensable tools in our digital age, shaping our choices and experiences across various domains, including music, language, and identity. As Kordzadeh and Ghasemaghaei (2022) highlight, firms' increasing adoption of data analytics, big data technologies, and artificial intelligence underscores the growing importance of recommender systems in enhancing operations and decision-making processes.

Consequently, Yohe et al. (2023) emphasize the need for recommender systems to evolve beyond their current limitations and incorporate socio-economic and cultural factors that influence consumer preferences, particularly as companies expand into diverse markets. According to Yohe et al. (2023), current recommender systems often lack global, socio-economic, and cultural awareness, leading to inaccurate recommendations, missed revenue opportunities, and customer dissatisfaction. Ferraro et al. (2023) point in the same direction and argue that the influence of recommender systems extends beyond personalized recommendations, shaping broader cultural experiences and trends. Along the same lines, researchers like Bauer (2019) are increasingly recognizing the need to consider the wider societal impact of these systems, including their potential to promote diversity, equity, and

inclusion. This is particularly relevant in domains like music, where recommender systems assist users in navigating vast music catalogs and influence the exposure and promotion of artists and songs (Afchar et al., 2022; Ferraro, 2021). However, as argued by Shrestha & Yang (2019), the growing prevalence of algorithmic decision-making in recommender systems has raised ethical concerns regarding transparency, fairness, and potential biases. Therefore, evaluating recommender systems requires a multidisciplinary approach that considers not only traditional metrics like accuracy and prediction but also their broader impact on user behavior, diversity, and societal values (Jannach & Zanker, 2022).

In the music industry, recommender systems have revolutionized how we discover and consume music. As Song et al. (2012) highlight, these systems are essential tools for helping users filter and discover songs that align with their tastes, emphasizing the need for personalization in music recommendations. However, the increasing complexity of MRSs has raised concerns about their transparency and potential biases. Bauer (2019) points out the prevalence of popularity bias, where popular items are disproportionately recommended, potentially obstructing the discovery of niche or less-known music. Afchar et al. (2022) address this issue by emphasizing the importance of explainability in MRSs. They argue that users should understand why certain songs are recommended to them, which can help build trust and satisfaction with the system.

The impact of music recommender systems extends beyond individual users, and academic efforts have been dedicated to examining the broader implications of these systems in the music marketplace. For instance, Turnbull et al. (2022) discuss the "long tail" phenomenon, where streaming services were expected to democratize the music industry by allowing listeners to discover niche artists. However, the authors find that streaming has led to a "winner-take-all" market, where superstar artists receive even more attention than before. This raises questions about the role of recommender systems in shaping the music industry and its potential impact on artist diversity and exposure. Levy & Bosteels (2010) further explore the relationship between recommender systems and the "long tail." Their research suggests that while recommender systems are designed to support the discovery of niche music, they often exhibit popularity bias, favoring globally popular items over less-known ones.

2.3.1. Spotify, the leading platform

Spotify, the leading music streaming platform, exemplifies the impact of recommender systems on music consumption and discovery. Due to its extensive number of songs and users and its inescapable impact, vast research has focused on studying the platform. Anderson et al. (2020) highlight Spotify's dual discovery mechanisms: user-guided search and exploration and algorithmic recommendations. This unique blend allows for a comparison between user-driven and algorithmically-driven consumption, providing insights into how listeners engage with music in the digital age. The authors found that both mechanisms play a substantial role in music discovery on the platform, indicating that users actively seek out music while also relying on algorithmic suggestions to broaden their musical horizons.

Building on this, Datta et al. (2017) explore the impact of Spotify adoption on music consumption patterns. Their research reveals a significant and persistent increase in music consumption following Spotify adoption, with users exploring a wider range of artists, songs, and genres. These findings suggest that Spotify facilitates music discovery, broadens musical horizons, and encourages exploration beyond familiar territories. The study also indicates that Spotify takes over consumption from other platforms like iTunes, highlighting its growing dominance in the digital music market. Furthermore, the authors found that Spotify adoption leads to a more fragmented market, potentially benefiting smaller artists and labels. However, they also note that while it's easier for artists to enter the consumption set, it's harder to stay there, as the staying power of songs and artists in consumers' playlists decreases, raising questions about the long-term impact of streaming platforms on artist sustainability and the diversity of music consumption.

Way et al. (2020) expand on this by examining the global implications of Spotify's on-demand streaming model. They observe a complex interplay between globalization and localization in music consumption patterns. While the Spotify platform offers access to a vast global music catalog, users also strongly prefer local content. The authors also found that while home bias, the preference for locally produced music, has been increasing, the effects of shared language songs have also grown, leading to more international streams. In contrast, the effects of geographic distance have become more negative, indicating that global music consumption has become more constrained in the streaming era.

Along the same lines, Terroso-Saenz et al. (2023) further explore the potential of Spotify data for understanding global song mobility patterns. Their analysis reveals interesting trends in how songs spread across different countries, with strong connections observed between

geographically close European countries and transoceanic connections linked to migration flows and shared languages. Additionally, the study highlights the prolific role of smaller countries in generating widespread songs, challenging the notion that music industry giants like the US and UK solely dominate the global music landscape. As a consequence, the authors develop a predictive algorithm to anticipate the spread of songs based on their streaming patterns, demonstrating the potential of Spotify data for understanding and predicting music trends.

Beyond its influence on music consumption and globalization, Spotify has fundamentally reshaped how listeners engage with music. Research by Abdullah (2018) highlights the rise of paid music streaming subscriptions and the subsequent revitalization of the music industry, stating that "music is back". The author argues that streaming services like Spotify have reversed the decline in global recorded music revenue, becoming the primary driver of growth in the industry.

2.3.2. Diversity in Recommender Systems

The concept of diversity in recommender systems has gained increasing attention in recent years, particularly in the context of music recommendations. Porcaro et al. (2021) lay the groundwork by defining diversity as a multifaceted concept. It encompasses not just the variety of recommended songs but also a balanced representation across genres and artists. They acknowledge the limitations of traditional diversity metrics and advocate for incorporating additional factors like disparity to provide a more comprehensive picture. Furthermore, they emphasize the importance of empowering users to make informed choices and explore a wider range of music.

Building on this foundation, Burgess et al. (2024) delve into the practical challenges of implementing diversity in recommender systems. A critical issue they address is the diversity-accuracy dilemma. While accurate recommendations are essential, an overemphasis on accuracy can come at the expense of diversity, potentially leading to user disengagement. The authors highlight the difficulty of striking a balance between these two aspects. They suggest that incorporating diverse filtering techniques, such as collaborative filtering and content-based approaches, along with considering contextual factors, can help navigate this dilemma and enhance the overall user experience.

Anderson et al. (2020) offer empirical evidence to support these concerns. Their research demonstrates that user-driven listening habits tend to be more diverse compared to those

driven solely by algorithms. This suggests that recommender systems might inadvertently contribute to a decrease in the variety of music users consume. The researchers compared diversity scores for the same user when the listening was programmed or organic, and they found that the vast majority of users are above the even distribution line, indicating that their programmed listening is less diverse than their organic listening. Interestingly, their findings also reveal a strong association between diverse listening patterns and positive long-term user engagement metrics, such as user retention and conversion. This underscores the importance of balancing short-term user satisfaction with long-term engagement by promoting diverse recommendations.

Datta et al. (2017) introduce an economic perspective on music variety consumption. They analyze limitations on variety from both demand and supply viewpoints. On the demand side, they highlight the dual purpose of music variety, matching individual preferences for specific genres and artists while also fulfilling a desire for broader listening experiences. However, acquisition costs, particularly for less mainstream music, can act as a barrier to users seeking variety. On the supply side, the authors discuss the concentration of revenue among a small number of artists. However, the authors also explore how this reality changed with the impact of streaming services, which have lowered the cost of accessing a wider variety of music for users and altered the artist reward structure.

2.3.3. Algorithmic Bias

While music recommender systems offer the potential for improved tailoring of content recommendations, they also carry the risk of perpetuating and amplifying societal biases. Kordzadeh & Ghasemaghaei (2022) and Wong (2020) highlight this significant ethical concern that recommendation algorithms, while promising enhanced decision-making accuracy and effectiveness, may inadvertently replicate and amplify existing societal biases. As explained by Kordzadeh & Ghasemaghaei (2022), algorithmic bias is an issue encompassing long-standing societal biases affecting specific groups, potentially leading to discriminatory or unfair results.

The potential consequences of algorithmic bias are underscored by Ekstrand et al. (2018), who found that recommender systems can exhibit demographic disparities in effectiveness. These disparities may correlate with the size of the user group, raising concerns about equitable access to the benefits of AI systems. According to the authors, underserved user groups, particularly those representing potential market segments, may signify areas for

improvement in recommender systems. The authors argue that attention to minority groups is crucial because the largest user subgroup tends to dominate overall statistics. If other subgroups have different needs, their satisfaction carries less weight in the final analysis, leading to a misleading perception of system performance and making it harder to identify how to serve specific demographic groups better. The authors suggest that popularity bias can worsen demographic biases, as favoring popular recommendations also favors the dominant group's taste at the expense of others. However, their empirical results do not definitively confirm this effect in their data.

The issue of bias in AI, particularly in recommender systems, is further emphasized by Färber et al. (2023), who define bias as the unfair favoring of certain groups or opinions. This bias can have far-reaching implications, as AI systems are increasingly used to make decisions that impact individuals and society. Identifying and mitigating such biases is a growing area of research interest worldwide. While researchers and developers acknowledge the problem, the focus on developing fair algorithms often remains primarily technical, potentially overlooking the broader societal implications of algorithmic bias.

Despite early efforts to address bias, the persistence of bias in computing is a concern raised by Wong (2020). The author argues that algorithms can inherit biases from datasets and acquire them during machine learning processes. Shrestha & Yang (2019) echo this concern, noting that the increasing delegation of decision-making to algorithms has led to growing evidence of ethical issues related to bias and unfairness. Algorithmic decisions can amplify biases embedded in data, particularly concerning sensitive features like gender, culture, and race. Elahi et al. (2021) contribute to this discussion by highlighting that recommender systems can either introduce bias into initially unbiased datasets or worsen existing biases. This finding underscores the need for careful consideration of bias throughout the development and deployment of AI systems. Specifically, the authors find consistent popularity bias across different languages - with English exhibiting the highest bias - and note that popularity bias affects not only item recommendations but also user ratings and overall average ratings. They emphasize the importance of recommending items beyond the popular ones to enhance new item discovery and cater to users with niche tastes.

Narrowing down to the music context, the literature review on music popularity bias shows opposing positions. On the one hand, Turnbull et al. (2022) investigate popularity bias in music recommender systems, finding that the most accurate model exhibits the most bias, while less accurate models show less. They also suggest that complex processes in

commercial music recommendations might explain the absence of popularity bias in those systems. Similarly, Levy & Bosteels (2010) challenge the notion that real-world music recommenders always exhibit strong popularity bias, finding that the influence of such recommenders on users' listening habits might be limited. On the other hand, Kowald et al. (2019) reproduce analyses on popularity bias in Last.fm music recommendations, confirming a positive correlation between artist popularity and recommendation frequency for most algorithms. Additionally, Abdollahpouri et al. (2020) examine the impact of popularity bias on different artist groups, finding that most algorithms discriminate against niche and middle groups while favoring mainstream artists.

In conclusion, scholars conceive recommender systems as a double-edged sword in the digital age. While they enhance personalization and user experience, their influence on cultural trends and their potential biases raise ethical concerns. In the music industry, these systems have revolutionized music discovery and consumption but also contribute to a winner-take-all market, potentially hindering the exposure of niche artists. Research on platforms like Spotify reveals the complex interplay of globalization and localization in shaping music preferences and the platform's substantial role in the industry's revitalization. However, the challenge remains to balance personalization with diversity and ensure that recommender systems promote a rich and equitable musical landscape. As these systems continue to evolve, ongoing research and ethical considerations on their biases are crucial to harness their benefits while mitigating their potential drawbacks.

2.4. Conclusion

In conclusion, this literature review has comprehensively explored the intricate relationship between music, culture, and technology in the digital age, shaped by globalization, technology, and evolving cultural identities. The dominance of Western music, particularly from the US, has raised concerns about cultural homogenization and linguistic imperialism as English increasingly becomes the global lingua franca. However, the concept of "glocalization" suggests that local cultures are not merely passive recipients of global influences but actively adapt and transform them, leading to the emergence of new hybrid musical styles.

According to the reviewed academic works, the rise of music streaming platforms, notably Spotify, has revolutionized music discovery and consumption patterns, offering unprecedented access to diverse music from around the world. However, they have also raised

concerns about algorithmic bias, fairness, and the potential for reinforcing existing inequalities in the music industry. Although streaming was expected to democratize the music industry, the trend has not fully materialized as superstar artists continue to dominate the market following a long-tail structure. As pointed out by the literature, the cause of this unexpected distribution is the increasing reliance on recommender systems in shaping music consumption, which has also raised ethical concerns regarding transparency, fairness, and diversity. While these systems aim to personalize recommendations, they often exhibit popularity bias, favoring mainstream artists and potentially hindering the discovery of less-known talent. Therefore, striking a balance between personalization and diversity remains a challenge, as does ensuring that algorithmic decision-making processes are fair and transparent.

Overall, this literature review underscores music consumption's dynamic and evolving nature in the digital age, highlighting the need for ongoing research and critical engagement with music consumption's cultural, social, and ethical dimensions in an increasingly interconnected world. The most relevant academic references in this Master Thesis are listed and summarized in Table 1:

Author	Relevance
Achterberg et al. (2011)	● Studied the presence of national languages in music charts across Europe and the USA before the digital era, finding hints of linguistic imperialism, especially before the 1990s. ● Serves as a methodological foundation for this thesis, which aims to extend their work by incorporating the impact of digital platforms.
Baltzis (2005)	● Introduced the concept of "transculture," describing the two-way flow of cultural traits in the digital age. ● Used in this thesis to understand the complex relationship between global and local musical influences.
Datta et al. (2017)	● Researched the impact of Spotify adoption on music consumption, finding increased consumption and exploration of diverse music. ● Supports the thesis's exploration of Spotify's role in shaping musical preferences.
Hassi & Storti (2012)	● Explored the "3H scenario" (homogenization, heterogenization, hybridization) in cultural globalization. ● Provides a theoretical lens for categorizing the impact of Spotify on national language music consumption.
Lesota et al. (2021, 2022)	● Examined the impact of recommender systems on globalization and music consumption patterns, highlighting the potential for both cultural imperialism and glocalization. ● Informs the analysis of Spotify's role in shaping cultural preferences and presenting a glocal reality in music streaming platforms.

Kordzadeh & Ghasemaghaei (2022)	● Developed a comprehensive framework on algorithmic bias. ● Applying to understand the user perception of the potential impact of Spotify in national language music.
Way et al., (2020)	● Explored the interplay between globalization and localization in music consumption patterns on Spotify, revealing a preference for local content despite increased access to global music. ● Used to analyze the dynamics of music consumption on Spotify across local and global cultures and languages.
Hesmondhalgh (2021)	● Discussed the impact of music streaming on musicians and the music industry, noting that 2016 was a turning point when streaming became a global phenomenon, and the music industry saw its first revenue increase in a decade. ● Used to contextualize the growth of Spotify and its potential impact on the music industry and national language music consumption.

Table 1: List of relevant academic works.

3. Theoretical Framework

As seen in the Literature Review, extensive research has been focused on the topics that define this research. Works on music culture, language globalization, recommender systems, and music streaming platforms rationalize the need for a further study that unites them all, setting this research's starting point. However, a framework is needed to provide the structure and conceptual underpinning for successfully contextualizing the literature findings.

A robust theoretical framework is essential for this academic research, providing a structured foundation for analysis and interpretation. It extends beyond simply summarizing existing literature; it involves identifying and integrating theoretical standpoints that are widely recognized and accepted within the academic community. These established theories serve as the bedrock of our research knowledge, offering a systematic framework for conducting the research analysis. While the literature review is invaluable for understanding the current state of the topic and generating research ideas, it often lacks the academic rigor and validation necessary for grounding a study. By incorporating a theoretical framework, this thesis can bridge this gap, ensuring that their work is built upon a solid foundation of established knowledge and contributing to the ongoing academic discourse in a meaningful way.

The theoretical framework of this research situates cultural and algorithmic knowledge within broader academic discourse. Unifying both research scopes under the same model helps the research methodology design by defining how entities such as culture and recommender systems individually operate and, especially, how both realities intertwine. Additionally, this framework offers relevant explanations for the observed phenomena by providing a theoretical basis for the quantitative and qualitative outcomes of the research analysis and their implications in the reality of music culture.

This research unifies two different realities that have inevitably come together due to the digitalization of our reality: on the one hand, the cultural dimensions of language and music - specifically minority ones - and their globalization process, and on the other hand, artificial intelligence technology in music recommender systems.

The clear separation between both areas demands the need for multisectional theoretical knowledge that provides an individual framework for each area and a common one to

interconnect both research dimensions. Consequently, the Cultural Globalization Theory and the Algorithmic Bias Theory will be studied.

3.1. Cultural Globalization Theory

Firstly, to understand Spotify's impact on national language music, it will be necessary to understand the actual interplay of global and local cultures and their power relationships. For that purpose, the Cultural Globalization Theory will be used. Cultural Globalization Theory is a relatively young concept, emerging in the early 1990s through the work of Appadurai (1992) and Robertson (1992).

3.1.1. Cultural Imperialism: The Starting Point

Though the term itself is recent, cultural exchange has existed throughout history, setting a constant interaction between global and local cultures. Before the digital era, this intercultural exchange had an imperialistic nature where powerful cultures exerted influence and control over less powerful ones through the dissemination of their cultural products, values, and norms. Schiller (1976) studied and theorized this systematic cultural colonization, resulting in the Cultural Imperialism theory.

The Cultural Imperialism Theory examines how powerful cultures exert influence and control over less powerful ones through the dissemination of their cultural products, values, and norms. This theory is rooted in the broader context of globalization and explores how the dynamics of power, particularly economic and political power, play out in the realm of culture. At its core, cultural imperialism states that dominant cultures, often associated with economically powerful nations or corporations, exercise significant control over the cultural expressions and identities of less dominant or peripheral cultures. This influence is commonly manifested through various channels such as media, technology, language, education, and popular culture. The result is a process where the values, beliefs, and practices of the dominant culture are disseminated globally, leading to the potential homogenization or erasure of local and indigenous cultures Schiller (1976). As exemplified by Schiller (1976), with the post-WW2 American imperialism, media plays a central role in the cultural imperialism thesis. The exportation of television shows, films, music, and other forms of media from powerful cultural centers can shape the perceptions and preferences of audiences around the world. This process often results in the dominance of Western cultural products on a global scale, sometimes at the expense of local and traditional forms of expression.

3.1.2. A theory for an interconnected world

The concept of cultural imperialism serves as the starting point for the study of cultural interplays. However, due to its early origin, the cultural imperialism theory presents a context that does not contemplate the actual interconnectedness of the world, crafted by advancements in communication technologies and the intensification of international trade and travel.

The need for a theory that updates the study of cultural influences to the digital era gives birth to the Cultural Globalization Theory. A theoretical concept that still considers the cultural imperialistic view of its predecessor but adds the additional influence flows that appeared in the globalized world. Similar to cultural imperialism, cultural globalization is understood as "a conceptual framework, a set of concepts, hypothesized linkages, and above all an optic that attempts to locate and clarify a wide range of problems" (Fejes, 1981). Unlike cultural imperialism, which directs scholars' attention toward cultural domination, the globalization of culture encourages researchers to focus on cultural resistance and consumption. This shift also remarks the agency of individuals and communities, both at individual and collective levels, in interpreting, adapting, and creatively utilizing cultural artifacts, often in ways that challenge dominant hegemonic narratives (Demont-Heinrich, 2011).

Furthermore, the core innovation of cultural globalization theory is the introduction of the concept of globalization. According to Chung (2006), although globalization is one of the most discussed concepts by academics, the term still remains ambiguous. Nevertheless, it is recognized that globalization is multidimensional and has economic, cultural, social, and political aspects that impact both individuals and societies, making it an inevitable process as no country can ignore it without leading to cultural marginalization (Jaja, 2010). Due to the relevance of globalization, it is crucial to use a theoretical definition of its cultural dimension to understand its causes and its influential effects on local cultures.

3.1.3. The concept of Cultural globalization

The interplay of globalization and culture, especially the impact of globalization on culture, has been a focal point of contention in scholarly discourse, leading to the development of various theoretical perspectives to understand these interactions.

According to Steger (2020), cultural globalization can be broadly defined as "the intensification and expansion of cultural flows across the globe". This definition, very similar

to globalization, bases its value on the concept of culture. When talking about the 'cultural', the concept refers to "the symbolic construction, articulation, and dissemination of meaning". Since language, music, and images serve as primary modes of symbolic expression, they hold particular importance within the realm of culture.

Following the logic of the definition, Steger (2020) points out that a tangible approach to assessing cultural shifts involves studying the changing global dynamics of language usage. The globalization of languages can be interpreted as a phenomenon by which some languages are increasingly used in international communication while others experience a decline in relevance and may eventually disappear due to a lack of speakers. To measure the state of language globalization, five key variables have been identified by Steger (2020) in collaboration with the Globalization Research Center at the University of Hawaii:

1. *Number of languages*: The declining number of languages in different parts of the world points to the strengthening of homogenizing cultural forces.
2. *Movements of people*: People carry their languages with them when they migrate and travel. Migration patterns affect the spread of languages.
3. *Foreign language learning and tourism*: Foreign language learning and tourism facilitate the spread of languages beyond national or cultural boundaries.
4. *Internet languages*: The Internet has become a global medium for instant communication and quick access to information. Language use on the Internet is a key factor in the analysis of the dominance and variety of languages in international communication.
5. *International scientific publications*: International scientific publications contain the languages of global intellectual discourse, thus critically impacting intellectual communities involved in the production, reproduction, and circulation of knowledge around the world.

Going back from the language level to the cultural level, the globalization of culture is frequently associated with international mass media. Emerging technologies like satellite television and the Internet have facilitated a constant stream of images and messages, significantly influencing cultures and communities and profoundly impacting the way people experience their everyday lives (Steger, 2020). Complementarily, as reflected in Figure 2, Hassi & Storti (2012) define media and communication technologies as well as migration, traveling, trade, and intellectual ideas as causes of cultural globalization.

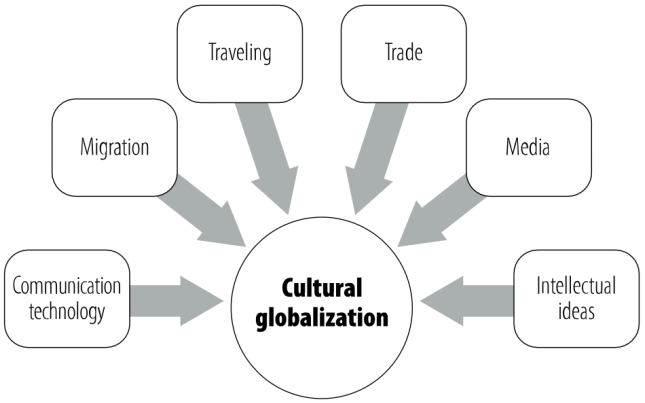

Figure 2: Causes of Cultural Globalization. Adapted from Hassi & Storti (2012)

3.1.4. Transculture and Glocalization

Following the idea of a globalized culture, Baltzis (2005) introduces the concept of "transculture", a contemporary phenomenon based on a more intense interaction between cultures as a result of the breakdown of economic and cultural barriers by the new digital ways of culture dissemination. According to Baltzis (2005), transculture must be understood as a two-way flow of cultural traits that "considers both the globalization of the local and the localization of the global". Baltzis (2005) exemplifies this scenario with the case of music culture. While digital networks have enhanced the spread of popular global music, local music has also modernized to the point that certain local music has been widespread all over the world, showing a globalization of the local from a cultural perspective.

"This view of musical culture is consistent with a more general sociological dimension, according to which localization should be taken into account along with globalization" (Baltzis, 2005). This bi-directional process, characteristic of the digital era, gives rise to the theoretical term "glocalization", which is the natural way in which global and local cultures can find a balance in the globalization system, consisting of "the ability of a culture, when it encounters other strong cultures, to absorb influences that naturally fit into and can enrich that culture, to resist those things that are truly alien and to compartmentalize those things that, while different can nevertheless be enjoyed and celebrated as different" (Friedman, 2000).

Glocalization is a response to the globalization process; therefore, the first can't be understood without the latter. Cultures have been glocalizing as long as there has been cultural exchange, picking the elements of other cultures that enhance and enrich their own culture while avoiding those elements that do not. As glocalization inherently involves

assessing global influences within a local framework, the method of cultures glocalizing and evaluating foreign influences will vary across cultures. At first, the criteria used by cultures to evaluate different practices and beliefs will be relatively local, but as the world becomes further interconnected, the criteria will increasingly become universal. The global will increasingly influence the decisions of the local.

Nonetheless, the local context will remain crucial, as glocalization involves adapting foreign practices and beliefs to align with local cultural traditions. The context might be universal in nature, but the procedure for how it is implemented will be local in nature. Consequently, the method of glocalizing is based on both the local and the global (Fernandez, 2009).

3.1.5. The 3 H Scenario

Therefore, globalization does not have to be a "top-down" or "bottom-up" system. Instead, it has shown that it can be a horizontal system where the local and global merge together in a balanced way. Academics have divided these different ways of interplay into three different theoretical standpoints that examine the power interactions between global and local cultures.

The first one is the *heterogenization* scenario. Certain scholars argue that globalization generates a condition of diversity, characterized by a network framework where nodes preferentially link based on specific cultural aspects (Matei, 2006). Instead of building barriers that prevent cultural homogenization, “heterogenization represents a process that leads to a more inwardly appearing world due to the intensification of flows across cultures” (Hassi & Storti, 2012). Therefore, local cultures undergo ongoing change and renewal as a result of global influences and pressures. Hence, despite the influence of globalization, it seems that cultural differentiation is likely to flourish, and what will probably change are the criteria used by different cultural groups to define their identity and differentiation from other cultures. (Hassi & Storti, 2012)

The second one is the *homogenization* scenario. The homogenization view claims that the strong globalization flows can’t be contained by weak barriers that should prevent cultures from looking alike, arguing the possibility of local cultures being shaped by more powerful cultures or even substituted by a global one (Ritzer, 2010). According to Prasad & Prasad (2006), across different regions and countries in the world, there is a growing trend of people tuning into similar entertainment programs, enjoying shared musical preferences, opting for globally recognized brand products and services, and even wearing similar clothes. These tendencies in cultural practices are an indicator of the emergence of a “global culture”

(Robertson, 1992) or “world culture” (Meyer et al., 1997). In the homogenization scenario, globalization consists of a replication of the American/Western cultural tradition that exerts a destructive force that local languages are not able to resist, diluting the uniqueness of national cultures and raising a homogenized world culture (Hassi & Storti, 2012).

The third and last one is the *hybridization* scenario. According to the hybridization perspective, cultural exchange involves a dynamic interplay between external and internal influences, resulting in a unique blend of global and local elements, resulting in the phenomenon of glocalization. While barriers to external influences exist and help to retain the locality of a culture, they are not strong enough to prevent external cultural influences, creating a cultural hybridization. This process involves the continuous mixing of cultures, leading to the emergence of new hybrid identities (Ritzer, 2010). The hybridization thesis advocates for cultural convergence while preserving individual identities, emphasizing coexistence in a cross-cultural framework (Hassi & Storti, 2012).

Although the academic community contemplates the three scenarios, both heterogenization and homogenization views present polarized conclusions. Instead, hybridization, with a more conciliatory view, advocates for a position that simultaneously contemplates the inevitable power of global influence and the resilient nature of cultures.

3.1.6. Criticism

Cultural globalization theory, despite its insightful contributions, faces some critiques. A central debate focuses on its ability to capture the intricate nature of cultural exchange. Some argue it presents an overly simplistic binary: homogenization (domination by a single culture) versus heterogenization (a vibrant mix of cultures). Critics like Appadurai (1990) suggested the reality is far more nuanced, with simultaneously homogenization and heterogenization forces at play. However, this polarized discussion was attenuated by the concealing view of hybridization.

Early versions of the theory were also criticized for focusing heavily on the global forces spreading culture, neglecting the agency of local communities, arguing that local communities actively interpret, adapt, and resist these influences, shaping cultural exchange in unique ways. This critique is captured again by the introduction of new theoretical terms, in this case, the "glocalization" concept.

Additionally, some scholars argue the theory focuses too heavily on cultural consumption (how people receive cultural products) and neglects cultural production (how cultural products are created and disseminated). This can lead to a view of audiences as passive consumers when, in reality, they can be active participants who reinterpret and even subvert cultural products. Finally, the theory is seen as not emphasizing enough the importance of cultural sustainability and the preservation of endangered languages.

In conclusion, while cultural globalization theory remains a valuable tool for understanding the complex ways cultures interact in our interconnected world, it's important to acknowledge these critiques and consider the theory's limitations when analyzing the nuances of cultural exchange.

3.1.7. Research Relevance

Cultural globalization theoretically backs the process of cultural influence, defining the different scenarios a local culture might face when interacting with global ones. At the same time, the theory recognizes media - including music media - as the vehicle for cultural globalization. Additionally, Cultural Globalization provides a modelized structure for identifying the causes of cultural globalization, assessing its impact in the language context, and defining the scenario of local-global interplay. For those reasons, the Cultural Globalization theory is a perfect fit for this research, and the use of its theoretical concepts will be key to this research.

In the context of this research, the Cultural Globalization theory will be used to support the analysis of language diversity in music consumption. The quantitative results obtained from the study of the first research question will be understood from a cultural globalization lens. The theoretical standpoints will help to comprehend the longitudinal metrics of music charts and define their cultural causes and the globalization scenario of national language music.

However, a theoretical model that can explain the influence of a new technological paradigm - music streaming and its recommender systems - on the cultural findings of national music consumption is still needed. For that purpose, the Algorithmic Bias Theory will be studied.

3.2. Algorithmic Bias Theory

The Algorithmic Bias Theory will be studied to understand how Spotify can shape culture consumption. Recognizing its biases towards local culture - especially in the context of music

- will be crucial to argue to which extent music recommender systems influence the cultural globalization scenario in music charts. Additionally, the study of relevant algorithmic biases will theorize the cultural effects on a technical level but also from a user perspective.

3.2.1. Algorithmic Bias and Cultural Globalization

The Algorithmic Bias theory is a naturally necessary addition to the Cultural Globalization theory in the theoretical context of this research. Once shaped by analog channels, the cultural reality is now crafted by the agents of a digital environment. Among these, recommender systems have become the dominant means of curating cultural content, significantly influencing the nature of individual cultural experiences (Afchar et al., 2022; Ferraro, 2021). Specifically, Lesota et al. (2021) indicate that recommender systems may considerably impact globalization, an impact that varies depending on the algorithm crafting the recommendations. Therefore, recommender systems have taken the position of cultural curators, and the same influence that once was exerted by cultural magazines or radio stations is now in the hands of these digital agents (Ferraro et al., 2023).

However, the fact that culture recommendation is now in charge of a non-human figure does not mean that the curation is exempt from any type of bias. As presented by Färber et al., (2023), algorithmic recommender systems present human-caused bias - subject to user behavior - and system-caused bias - caused by unfair data or inducted by the model itself during the training and development of the recommender system. And, as stated by Yohe et al. (2023), “the design of recommender systems that intentionally incorporate contextual information related to users' cultural, socioeconomic, and geographic backgrounds remains limited”.

The mutual influence between culture and recommender systems creates the need for research to define the interplay between them theoretically. For that purpose, the functioning and biases of recommender systems and their impact on cultural globalization will be studied under the theoretical frame of the Algorithmic Bias theory.

3.2.2. The Algorithmic Bias Theory

The Algorithmic Bias Theory argues that the algorithms and models used in artificial intelligence systems reflect the biases present in society as societal biases influence the data used to train and the designers of those systems. As a result, the outputs of algorithms may

also reflect these biases and reinforce them in ways that are harmful to specific groups of people (Kordzadeh & Ghasemaghaei, 2022).

Wiezenbaum (1976) introduced the concept of algorithmic bias by suggesting that bias could arise both from the data used in a program and from the way a program is coded. However, it was not until recent years, with the emergence of algorithmic systems, that the concept was popularized and refined with extensive research.

Using the extensive discussion on the topic, Kordzadeh & Ghasemaghaei (2022) have developed a theoretical model that aims to explain algorithmic bias in a systematical way. The social dimension encompasses long-standing societal biases that disproportionately affect marginalized groups. In contrast, the technical dimension refers to the manifestation of these social biases in the outcomes produced by algorithms. According to Kordzadeh & Ghasemaghaei (2022), two core themes consistently emerge across various definitions of algorithmic bias: 1) a deviation from an equality principle emerges in the outputs of a biased algorithmic system, and 2) the deviation occurs systematically and repeatably, not randomly. Resulting in the overarching definition of "algorithmic bias is a systematic deviation from equality that emerges in the outputs of an algorithm".

Consistent with the algorithmic bias definition and its systematic nature, Kordzadeh & Ghasemaghaei (2022) define a multisided framework that encapsulates the perception and behavioral responses to algorithmic bias and the contextual factors that shape the process. The authors conceive algorithmic bias, perceived fairness, and behavioral responses as relational processes and define them as contextual factors framed by individual, task, technology, organizational, and environmental characteristics. In this model, the relations between entities will be defined by the following propositions:

Proposition 1 (P1): *Algorithmic bias negatively influences perceived fairness*. According to Kordzadeh & Ghasemaghaei (2022), there is a correlation between the algorithm's outputs and its process characteristics and the perception of fairness associated with that algorithm.

Proposition 2 (P2): *Perceived fairness positively influences recommendation acceptance, algorithm appreciation, and system adoption*. When users recognize unfairness in an algorithm's outputs or underlying logic, they may be more likely to explore strategies - such as refraining from accepting the algorithmic recommendation, engaging in algorithm aversion, and refusing to adopt an algorithmic system - that mitigate the algorithm's unethical consequences (Kordzadeh & Ghasemaghaei, 2022).

Proposition 3 (P3): *Individual characteristics moderate the relations among algorithmic bias, perceived fairness, and behavioral responses*. This effect can be explained by the confirmation bias theory, which suggests that people tend to have a positive attitude toward information and technologies that help confirm their existing beliefs (Kahneman, 2011; Kordzadeh & Ghasemaghaei, 2022).

Proposition 4 (P4): *Task characteristics moderate the relations among algorithmic bias, perceived fairness, and behavioral responses*. Lee (2018) demonstrated that tasks demanding human skills, such as hiring or performance evaluations, tend to be perceived as fairer when humans make decisions rather than algorithms. Conversely, users are more likely to accept algorithmic recommendations regardless of perceived fairness for tasks requiring lower levels of human intuition and expertise, like mechanical processes (Kordzadeh & Ghasemaghaei, 2022).

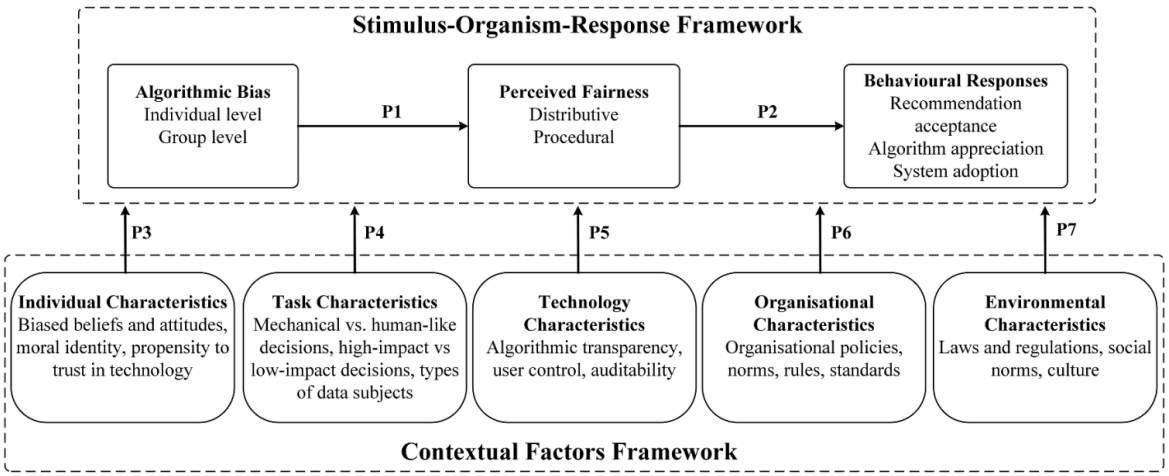

Figure 3: The Algorithmic Bias Framework (Kordzadeh & Ghasemaghaei, 2022).

Proposition 5 (P5): *Algorithmic technology characteristics moderate the relations among algorithmic bias, perceived fairness, and behavioral responses*. A significant challenge in the application of algorithmic tools is their opacity. While transparency in resource allocation processes can enhance perceptions of fairness by allowing individuals to comprehend the basis for decisions, it can also diminish such perceptions by revealing unequal distributions or disparities (Kordzadeh & Ghasemaghaei, 2022).

Proposition 6 (P6): *Organisational characteristics moderate the relations among algorithmic bias, perceived fairness, and behavioral responses*. Organizational policies and regulations promoting Diversity, Equity, and Inclusion can cultivate an ethical environment by prompting decision-makers to recognize and address potential biases within algorithmic processes and

outcomes, ultimately influencing fairer behavioral responses (Kordzadeh & Ghasemaghaei, 2022).

Proposition 7 (P7): *Environmental characteristics moderate the relations among algorithmic bias, perceived fairness, and behavioral responses*. One method for promoting ethical behavior involves legal and regulatory frameworks. Anti-discrimination laws, data protection acts, and regulations promoting algorithmic accountability can influence individual conduct by altering incentive structures to favor prosocial and unbiased choices. At the same time, cultural factors also play a significant role in shaping perceptions and decision-making around ethical dilemmas. Therefore, individuals influenced by social norms, existing legal frameworks, or cultural conditioning toward unbiased decision-making may resist algorithmic systems that produce discriminatory outputs (Kordzadeh & Ghasemaghaei, 2022).

3.2.3. Popularity Bias

Among all the algorithmic biases that a recommender system can exhibit, popularity bias is the most discussed, especially in the music context, as seen in the literature review. Popularity bias in recommender systems refers to a disparity of item popularities in system recommendations where popular items are disproportionately more present than less popular ones (Ekstrand et al., 2018). Such a popularity bias has been evidenced in different domains, such as movies, product reviews, and music, where recommendations are typically crafted with collaborative filtering algorithms. Collaborative filtering recommender systems exhibit a particular susceptibility to popularity bias. This susceptibility arises from the inherent data imbalance within their training datasets. Due to user behavior patterns, these datasets contain a significantly higher volume of user-item interactions for popular items compared to less popular ones, leading the recommender system to prioritize popular items in its recommendations regardless of individual user preferences (Abdollahpouri et al., 2020). As a result, item popularity across most domains, especially music, exhibits a long-tail distribution where a limited number of items achieve widespread popularity. At the same time, the vast majority remain relatively unknown (Celma, 2010).

According to Zhu et al. (2021), this bias can hurt both users and items. Users experience a diminished experience as the system perpetuates a biased understanding of their true preferences. On the item side, popular - but not necessarily better - items gain further exposure, while less popular items are denied the opportunity for deserved feedback (through clicks or views) and potential economic benefits due to this bias. In their work, Zhu et al.

(2021) identify four key factors that may impact popularity bias and its evolution: (1) inherent audience size imbalance: users may naturally prefer some items over others. Therefore, even in a bias-free recommender, a few items may have very large audience sizes while the majority have small ones; (2) model bias: the design of the recommendation model itself can amplify existing imbalances within the training data; (3) position bias: the presentation order of recommendations can further influence user behavior. Items displayed prominently at the top of the list are more likely to be clicked on, potentially regardless of their inherent quality.; and (4) closed feedback loop: The cyclical nature of recommender systems creates a feedback loop. Data gathered from user interactions with the current model's recommendations taints the training of subsequent iterations, leading to an accumulation of popularity bias over time.

Finally, vast research has focused on measuring popularity bias, and different metrics - including those defined in the algorithmic bias framework - have been employed for it (Bauer, 2019). Therefore, it does not exist a unique way to asses popularity bias, but the same reasoning is shared by every different metric: “A recommendation algorithm introduces no further algorithmic bias when the distribution of popularity values of recommended items (tracks) exactly matches the distribution of popularity values of already consumed items (listening history) for each user” (Lesota et al., 2021).

3.2.4. Criticism

Although recent, the Algorithmic Bias theory has also received criticism. The Greenlining Institute (2021) points out how the focus on algorithmic bias ignores broader social bias. As algorithms simply act as mirrors reflecting - and potentially amplifying - the biases already present in society, focusing on algorithmic neutrality must be misguided. Instead, the critique suggests that efforts to remove bias in algorithms could be more effective if they also addressed the underlying social and economic factors that create bias in the first place. Consequently, to this critique, the algorithmic bias analysis made in this research will be complemented by the social perspective learned from the study of the Culture Globalization Theory. This way, it will be possible to numerically identify major language biases on music streaming while giving a social meaning to the numbers by identifying both cultural and algorithmic causes and consequences. Therefore, to avoid this challenge, it will be necessary to go once again back to the concepts learned about cultural globalization in music streaming to surgically frame the context of the problem and be able to choose an optimal metric to measure a possible bias.

3.2.5. Relevance

Nonetheless, the concepts related to the Algorithmic Bias Theory will have a major importance in this research. In the first place, using the learned definition of diversity in the algorithmic context will represent a starting point for evaluating music diversity in streaming platforms. Afterward, learning about the dynamics of cultural globalization and algorithmic bias will help to understand the causes of the obtained data. By complementing it with the algorithmic bias framework, it will be possible to assess the impact of recommender systems on the observed music trends.

Additionally, the Algorithmic Bias Theory will provide the research with tools to precisely assess the impact of algorithmic bias on the perceived fairness and the consequent behavioral responses. The same happens with fairness measures. Knowing different ways to measure fairness will make it possible to choose the most optimal one for the research and reach an objective assessment of such an abstract concept.

Finally, learning about the distinction between numeric and perceived fairness has been crucial for the definition of this research. The fact that the perception of a system's fairness can vary depending on the studied agent has made this research analyze fairness on music recommender systems from a statistical point of view but also taking into account the users' view.

3.3. Conceptual Framework

In the last section, Cultural Globalization and Algorithmic Bias are presented as the theories that will give meaning to this research's definition, analysis, and outcomes, along with the knowledge gathered in the literature review. Both frameworks were presented by stating their definitions, limitations, and relevance within the research. However, as we are using multiple theories for the definition of the research conceptual framework, it will be necessary to clearly define the relationships between theoretical entities, giving a conceptual congruence oriented to the goals of this research.

3.4. Framework Construction

Both selected theories belong to a different knowledge domain. Cultural Globalization Theory, focused on the social science domain, presents content that tries to understand a social phenomenon on a higher level. Algorithmic bias theory, with a computer-science nature, examines methodical definitions and tools to categorize an algorithmic - but also

social - challenge. This duality will make it impossible to unite the content of both theories at the same level. However, it will still be possible to create a framework that uses the Cultural Globalization Theory to contextualize the contents of the Algorithmic Bias Theory, using the social implications of the latter as an integrating point.

From a structural view, the Algorithmic Bias framework will be contained within the cultural Globalization Theory as all the concepts used in algorithmic bias will be contextualized into the reality defined by cultural globalization. Following that reasoning, the cultural dimension will naturally command the research flow from the beginning - research context definition - to the end - result implications. The theoretical concepts of Algorithmic Bias will have a narrower scope, centered on the assessment and analysis of both quantitative and qualitative data.

The linking point between both theories will be justified by their inevitable togetherness in the realm of music recommender systems. This idea is supported by the work of multiple researchers, who affirm that the constant streaming of messages and content has profoundly impacted people day-to-day and is a major cause of cultural globalization and glocalization (Baltzis, 2005). On the same note, Lesota et al. (2021) point out recommender systems as the agents of this impact because, in the words of Ferraro et al. (2023), “recommender systems have taken the position of cultural curators”. Based on research literature, it is possible to confidently affirm that algorithmic bias is a reason for cultural globalization. Therefore, an analysis using the concepts of the Algorithmic Bias Theory will make sense under the contextualization of the Cultural Globalization Theory.

3.5. Framework Use

The definition of the application of this conceptual framework will be done following the natural sequence of the research. In the first place, the definition of the research problem lies in the social challenge of language unfairness, which is pointed out in the literature review and further studied for both theories. In that scenario, Cultural Globalization will be used to point out the possible homogenization process of culture. To support that idea, the causes of cultural globalization defined by Hassi & Storti (2012) will be employed. Also, Steger’s (2020) work will be used to consider language state as a key factor in measuring globalization. At the same time, studying the theoretical terms of transculture and globalization will favor the consideration of different cultural change scenarios - homogenization, homogenization, and hybridization.

Regarding the research methodology, the concepts learned from the Cultural Globalization theory will be used to select a longitudinal nature for the quantitative analysis that contemplates data records from before to after the irruption of music recommender systems. The Algorithmic Bias theory will also influence the design of the quantitative part. Knowing the influence of recommender systems on cultural globalization, the research will compare data from music streaming platforms (RecSys influenced) to data from radio stations (no RecSys influence). Additionally, the Algorithmic Bias framework will be used to include a qualitative analysis of this research. The qualitative data collected from user interviews will be key to assessing perceived fairness.

In the data analysis part, multiple concepts of the Algorithmic Bias Theory will be used. First, Porcaro et al.'s (2021) definition of music RecSys diversity has been employed as a reference to measure whether the language distribution in charts is diverse. Similarly, the metrics listed by Kordzadeh & Ghasemaghaei (2022) and the concept of popularity bias will be used to measure bias in the quantitative data. Finally, the qualitative analysis of interviews will spin around the theoretical definitions and implications of the concepts of distributive and procedural fairness (Kordzadeh & Ghasemaghaei, 2022).

Lastly, for the result discussion, the propositions introduced by Kordzadeh & Ghasemaghaei (2022) as part of the Algorithmic Bias framework will be used to study the causes of the levels of algorithmic bias and perceived fairness found in the analysis. Apart from the causes, the possible consequences will also be studied using Kordzadeh & Ghasemaghaei's (2022) theoretical considerations on behavioral responses. To conclude the discussion, the research will go back to the Culture Globalization level and, using all the retrieved information, will categorize the state of language fairness on music RecSys in one of the 3H scenarios.

4. Methodology

After exploring the academic knowledge on the topic, it is time to keep the purpose of this research in mind again: to study the impact of the Spotify on national language music consumption. To ensure the robustness of this research outcome, it is necessary to build an equally robust methodology to achieve these outcomes. Therefore, in this chapter, the methodological strategy is shared and justified, differentiating between the two parts of this study: the chart analysis and the consumer interviews.

4.1. Research philosophy and design

This research embraces a post-positivist philosophy, acknowledging an objective reality while recognizing the inherent limitations and potential biases in understanding it. This approach aligns with the exploratory nature of this research, rejecting hypothesis-driven methods in favor of inductively uncovering objective trends in national language music consumption through quantitative chart analysis while also acknowledging the subjective experiences and perceptions of Spotify users through qualitative interviews.

Consequently, a mixed-methods design has been chosen, combining quantitative and qualitative approaches to provide a comprehensive understanding of the impact of Spotify on national language music consumption. The quantitative component involves a longitudinal analysis of European song charts, examining the presence of national language music before and after the emergence of Spotify on both Spotify charts and national radio charts. The qualitative component consists of semi-structured interviews with Spotify users across Europe to gather their perceptions of the platform's impact on national language music consumption. By combining both types of data, the research can triangulate findings, enhancing the validity and credibility of the results.

Furthermore, the post-positivist approach acknowledges the potential for researcher bias and encourages reflexivity. When analyzing the chart data and interpreting interview responses, the researcher has been mindful of their own biases and how they might influence their interpretations. This self-awareness and critical reflection are essential for maintaining the rigor and integrity of the research process.

4.2. National language definition

As stated in the research introduction, the original aim of this work is to measure the impact of Spotify on minority language music consumption. However, "minority language" is ambiguous and needs clarification within the methodology, as its definition (broad or narrow) directly affects the thesis' findings.

The concept of "minority language" lacks a universally accepted scholarly definition due to the diverse range of criteria employed to categorize languages, including demographic, socio-political, and ethno-social approaches. A first definition was attempted by the Council of Europe (1992) with the European Charter for Regional or Minority Languages to protect and promote historical regional and minority languages in Europe. The Charter considered as minority languages those languages which were 1) traditionally used within a given territory of a State by nationals of that State who form a group numerically smaller than the rest of the State's population, 2) different from the official language(s) of that State. However, that definition was not ratified by all the European nations and never reached substantial support because of its incoherence. By following that definition, languages like Luxembourgish - with only 336.000 native speakers - have not been considered a minority language as it is the official language of Luxembourg, the only country where it is spoken. In contrast, a language like German - with more than 95 million European native speakers - could be considered a minority language in regions of France where it is spoken but not official (Wikipedia, 2024e, 2024c, 2024a).

More recently, a second method to categorize minority languages was presented by Grenoble & Singerman (2014), providing a more simple and straightforward approach: a minority language is one that is spoken by less than 50% of the population of a given region, state, or country. However, this scope also presents significant challenges. Firstly, due to its high scope sensitivity a language that is a majority in a specific regional scope can quickly become a minority one when making the regional scope broader. Secondly, following this definition, all the European languages have been considered minority languages in the European scope as, due to the high granularity of European languages, no European language has more native speakers than 50% of the European population (Wikipedia, 2024c).

These two cases highlight the inherent difficulties in classifying European languages into minority and majority groups. In response to this challenge, the possibility of establishing a

research-specific definition of "minority language" based on speaker thresholds was considered. However, this approach was ultimately rejected due to the lack of a clear reasoning for defining such thresholds, which would introduce an arbitrary element into the classification process.

In light of this definition challenge, the solution was found in conscientiously adapting the language analysis focus. Instead of dividing between minority and majority languages, this research aims to confront global and local scopes by categorizing between national and foreign languages. The European national languages (presented in Table 2) are easily defined as the official languages of each European nation. In turn, this simpler definition still aims to assess national language music consumption in the face of potential linguistic colonialism from the digitally globalized music landscape. With this new definition, there are European countries - such as Spain, the UK, or France - where the national language is, at the same time, an “imperialistic” language due to the imperialistic past of the nations they represent. In these cases, it will still be interesting to study how those national - but also global - languages have particularly been present in the national charts over the years.

4.3. Chart methodology

With that goal in mind, the first part of this research consists of a longitudinal study of the presence of national language music in European song charts, which examines the impact of the irruption of Spotify on national music consumption.

4.3.1. Chart retrieval

Out of all music streaming platforms, Spotify is the unique music streaming platform considered for this study. Spotify has been chosen as the music streaming platform with the biggest market share and the most subscribers (Tadesse, 2024) and, therefore, the biggest impact on music consumption. Although studying charts from platforms such as Apple Music and YouTube Music was considered, its use was discarded due to time constraints as chart data retrieval requires extensive time and because the study of different platforms adds an additional layer of complexity to the analysis.

Besides studying the Spotify-made charts, it is interesting to analyze the other perspective: how music charts that do not have a direct influence on the Spotify recommender system have

included national language music. For that purpose and to study the interplay between both worlds, national charts have been used.

As for Spotify charts, the Weekly Top 200 National Songs chart has been used. The way this chart is crafted with a song ranking based on the number of streams and its constant weekly refresh that helps to capture also short-term trends make this chart a perfect fit for the research (Afroplug, 2023; Spotify, 2024b). As for national charts, it was impossible to find a shared provider for all the studied countries. Therefore, the same chart type from different providers has been selected. These charts generate a weekly top of songs based on the number of sales, streams, and airplay on the country's radio stations [see methodology in the annex]. Although a Spotify chart was found for some European countries, retrieving a suitable national chart was impossible as it was so recent, with incomplete data or a non-suitable crafting methodology. In those cases, their data was not counted in the part of the study where the Spotify charts trends are compared to radio stations.

Due to the different number of songs included in the weekly Spotify and national charts, the number of analyzed songs has been fixed to the top 20. 20 was the maximum common number of songs found in all the Spotify and commercial charts. This way, it is possible to have a uniform song sample that, while still having a meaningful size, significantly reduces the processing and analysis time—a 90% reduction in the Spotify chart case.

Regarding the chart time frame, all the charts are updated until the last week of 2023, having a uniform and recent ending point. The data provided by Spotify starts from December 2016, a suitable 7-year time frame for a trend analysis. The starting point from radio charts varies depending on the country. The earliest was January 2004, and the latest was October 2016, an acceptable time frame for obtaining meaningful insights and contrasting them with Spotify trends. Some national charts had earlier records than 2004, but they were not considered in this study as the additional efforts to analyze those charts would be higher than their real relevance for the measures.

Regarding the geographical scope, this study has been bound to European countries due to the following reasons:

- Almost every European country has complete radio and Spotify datasets. Besides some exceptions, it is not possible to find complete and extensive chart datasets of countries of other continents.

- This project is under the supervision of two European universities (PLUS and AAU) and collaborating with the EU-centered FairMusE project. Therefore, European-centered findings will be the most appreciated and relevant.
- As a Spanish national, framing the analysis to European countries helps me to generate more insightful outcomes as I am more familiar with the cultural and social context of European countries.

Furthermore, as the first part of the study is focused on analyzing the presence of national language songs, it is necessary to justify which languages are local for each nation. In the context of this research, a country's national languages are the ones recognized as official by the country's government. With this definition, it is possible to observe language colonialism on music charts where foreign languages (non-official) might be taking the place of national languages (official ones). The following table shows the official languages of the selected European nations and the definition source. The following table contains a breakdown of the Spotify and commercial charts used for the study:

Country	Official Languages	Spotify chart	Commercial chart	Time frame
Austria	German, Slovenian, Croatian, Hungarian	Spotify	Media Control GfK	Spotify: 2016-2023 National: 2004 - 2023
Belarus	Belarusian, Russian	Spotify	No suitable chart was found	Spotify: 2022-2023
Belgium	Dutch, French, German	Spotify	Ultratop NL Ultratop FR	Spotify: 2016-2023 National: 2004 - 2023
Bulgaria	Bulgarian	Spotify	Bulgarian National Top20	Spotify: 2016-2023 National: 2007 - 2023
Cyprus	Greek, Turkish	Spotify	No suitable chart was found	Spotify: 2016-2023
Czech Republic	Czech	Spotify	IFPI	Spotify: 2016-2023 National: 2006 - 2023
Denmark	Danish	Spotify	Nielsen Music Control	Spotify: 2016-2023 National: 2004 - 2023
Estonia	Estonian	Spotify	No suitable chart was found	Spotify: 2016-2023
Finland	Finnish, Swedish	Spotify	IFPI	Spotify: 2016-2023 National: 2004 - 2023
France	French	Spotify	SNEP	Spotify: 2016-2023 National: 2004 - 2023
Germany	German	Spotify	Offizielle Deutsche Charts	Spotify: 2016-2023 National: 2007 - 2023
Global (refers	N/A	Spotify	Mediatraffic	Spotify: 2016-2023

to global scope)				National: 2004 - 2023
Greece	Greek	Spotify	Top 40 Charts	Spotify: 2016-2023 National: 2004 - 2023
Hungary	Hungarian	Spotify	Slagerlisták	Spotify: 2016-2023 National: 2004 - 2023
Iceland	Icelandic	Spotify	No suitable chart was found	Spotify: 2016-2023
Ireland	English, Irish, Gaelic	Spotify	IRMA	Spotify: 2016-2023 National: 2004 - 2023
Italy	Italian	Spotify	Top 40 Charts	Spotify: 2016-2023 National: 2004 - 2023
Latvia	Latvian	Spotify	No suitable chart was found	Spotify: 2016-2023
Lithuania	Lithuanian	Spotify	No suitable chart was found	Spotify: 2016-2023
Luxembourg	Luxembourgish, French,German	Spotify	No suitable chart was found	Spotify: 2016-2023
Netherlands	Dutch	Spotify	Stichting Nederlandse	Spotify: 2016-2023 National: 2004 - 2023
Norway	Norwegian, Sami	Spotify	VG	Spotify: 2016-2023 National: 2004 - 2023
Poland	Polish	Spotify	EURO 200	Spotify: 2016-2023 National: 2010 - 2023
Portugal	Portuguese	Spotify	EURO 200	Spotify: 2016-2023 National: 2006 - 2023
Romania	Romanian	Spotify	No suitable chart was found	Spotify: 2018-2023
Slovakia	Slovak	Spotify	IFPI	Spotify: 2016-2023 National: 2016 - 2023
Spain	Spanish, Catalan, Basque, Galician, Occitan	Spotify	Promusicae	Spotify: 2016-2023 National: 2005 - 2023
Sweden	Swedish	Spotify	IFPI	Spotify: 2016-2023 National: 2004 - 2023
Switzerland	German, French, Italian, Romansh	Spotify	Media Control GfK	Spotify: 2016-2023 National: 2004 - 2023
Turkey	Turkish	Spotify	No suitable chart was found	Spotify: 2016-2023
Ukraine	Ukrainian	Spotify	FDR	Spotify: 2020-2023 National: 2016 - 2023
United Kingdom	English, Welsh, Gaelic, Scots, Irish	Spotify	Official UK Singles Chart	Spotify: 2016-2023 National: 2004 - 2023

Table 2: National language, charts, and time frame of the Global and European countries included in the study.

4.3.2. Language identification

Once the song retrieval methodology and national languages are defined, it is crucial to define an optimal methodology for retrieving song lyrics and identifying their languages. Thorough research was made to find a service that provides the lyrics languages of a certain song, but neither the Spotify API nor other free services provided that information. Therefore, song language identification is divided into two subprocesses: song lyrics retrieval and lyrics language identification.

For lyrics retrieval, the GeniusLyrics API was used. The API structure allows on-the-go and easy endpoint access to the lyrics service, which is perfect for the project need and requires no scraping. The service is based on the database of GeniusLyrics, a platform where users collaboratively add and correct lyrics of worldwide songs and that supported Spotify's lyrics features until 2020 - when MusixMatch took over (Musixmatch, 2021). Compared to other API options, GeniusLyrics was the only one that offered a complete lyrics dataset - covering over 1.7 million songs (Genius App, 2024) - and free access for developers with unlimited queries.

To define the language of received lyrics, Polyglot was used. Polyglot is a Python natural language processing package that supports language detection of over 195 languages - including all the official national languages used in this research, with the exception of Sami (Polyglot, 2015a). Compared to other language detection packages, what makes Polyglot an excellent match for the research goals is its unique mixed text functionality, which succeeds in the detection of songs in multiple languages. When presenting the detection results, Polyglot presents a confidence score on the language of the lyrics, stating confidence in more than one language in the case of multiple language songs (Polyglot, 2015b). However, to avoid false positives, the minimum confidence to consider a song language has been established as 10% - a threshold defined by systematically observing that false positives usually stay below this number and that true positives barely go under it.

In many cases, Polyglot detected multiple true positives on songs that might contain words and expressions in a language different from the principal song language. Although they have insightful information, these secondary languages have not been considered for the language presence metrics. Only the principal language has been considered when computing the language statistics, leaving the insights of the secondary languages for future research.

4.3.3. Chart analysis method

To establish a broader context for this research, the analysis begins by examining language distribution on the global chart. A metric aggregating worldwide music consumption serves as a reference point for subsequent studies at the European and country levels. Both Spotify and national charts are considered for this global analysis, utilizing the Top 20 songs from the Spotify Weekly Top Songs Global chart and the United World Chart by Mediatraffic, respectively.

Both global chart analyses track the trend of English, Spanish, or other languages being the primary language of song lyrics across different weekly charts. The decision to categorize languages into three groups (English, Spanish, and Other) is based on the consistent relevance of only English and Spanish throughout the analyzed timeframe.

When Polyglot detected multiple languages in song lyrics, only the primary language - the one with the highest confidence score - was considered. This approach, while neglecting other possible languages present in the song, offers a better ratio of avoiding false positives and creates a consistent measurement across all songs. This avoids the challenges of categorizing songs with varying numbers of languages and the complexities of using language presence percentages, which would be difficult to plot and compare.

In chart analyses involving aggregated national metrics, a simple average was used without weighting by factors like population size or number of language speakers. This approach gives equal importance to both minor and major cultures/countries when analyzing national language presence, preventing the results from being majorly reflective of trends in major countries.

The analysis also explores whether the popularity of a national language influences its presence in the charts. To measure this, European national languages have been divided into two groups based on the number of native speakers in Europe. One group includes languages with over 40 million native European speakers, while the other includes languages with 40 million or fewer native speakers. This division reflects the importance of a language within the European context, with the 40 million threshold separating languages from countries with an imperialistic past (e.g., Russian, German, English, French, Spanish, Italian) from those of other countries. The resulting groups and their respective countries are detailed in Table 3 and Table 4.

In conclusion, the chosen methodology for analyzing national language presence in both Spotify and national charts seeks to strike a balance between optimally representing the actual presence of national languages in European charts while addressing the inherent research limitations of available chart data and time constraints. These limitations undoubtedly present opportunities for improvement in future research endeavors that build upon and expand the current analysis.

4.4. Interview methodology

To complement the quantitative chart analysis and gain a deeper understanding of the impact of Spotify on national language music consumption, qualitative interviews were conducted online with five European Spotify users. As stated in the Introduction chapter, the number of interviews was limited to 5 due to time constraints. For this study, the exploratory nature of the qualitative analysis makes five interviews an acceptable number to paint a general picture of users' perspectives on Spotify's impact. However, to conduct a deeper assessment and obtain a robust view of the exact perceptions of users at the European level, a more extensive and diverse sample of interviewees would be required, representing the wide range of profiles that European Spotify users could have and allowing a complete understanding of the diverse experiences and opinions on the perceived impact of Spotify in the consumption of national language music.

4.4.1. Interview definition

The interview participants with a purposive sample based on the following criteria:

1. **Nationality:** Participants were nationals of European countries included in the quantitative chart analysis, ensuring relevance to the overall research context.
2. **Spotify Usage:** Participants were active Spotify users with individual Premium accounts, ensuring they engage with the platform's recommendations based on their preferences and not others - as it can happen in Spotify familiar plans.
3. **Experience:** Participants had used Spotify long enough - at least three years - to have formed opinions about its emergence and impact on music consumption.

All interviewees were known to the researcher prior to the study, ensuring accessibility and establishing rapport. However, careful consideration was given to participant selection to maintain the integrity of the purposive sampling criteria. It is anticipated that pre-existing relationships will not impede participants from expressing their opinions freely or honestly.

The selected interviewees are from a diverse range of countries - Germany, Norway, Sweden, Greece, and Hungary. While some interviewees came from countries with widely spoken languages like German, their insights were still valuable in contrasting the experiences of those from countries with minority national languages.

The online interviews, ranging from 30 to 45 minutes in length, followed a semi-structured format, guided by a question outline while allowing for flexibility and open-ended conversations. The questions explored topics such as music consumption habits, the discovery of national language music, perceptions of Spotify's recommendations, and overall opinions on the platform's impact.

4.4.2. Interview analysis method

The analysis of the interview data focuses on identifying recurring themes and patterns across the five participants, highlighting both commonalities and divergences in their perspectives. The interview guide and transcripts, available in the annex, provide the complete details of the interview guide and transcripts.

The interview analysis began with a pilot interview designed to validate question clarity, topic appropriateness, and allocated time and to provide practice for subsequent interviews. However, the pilot interview's success led to its inclusion as one of the five analyzed interviews in this research. Following the successful pilot interview, four additional interviews were conducted, bringing the total to five for analysis. While all interviews revolved around the same core topics, the specific questions and their order varied due to the conversational nature of each interaction.

Each interview, conducted via Microsoft Teams, was analyzed using a consistent system. First, the platform's automated transcription feature generated a transcript of the questions and answers. This transcript was then meticulously cleaned and refined. Relevant insights were extracted from each interviewee's responses from the cleaned transcript. Once all insights were extracted, they were systematically grouped into distinct topics. This allowed for a comparative analysis of insights from different interviewees under the same subject, revealing both similarities and discrepancies in their perspectives. In the final step, these topics were further organized into overarching themes, simplifying the analysis of interview insights in relation to the research questions.

5. Analysis

This section presents the data obtained by using the defined quantitative methodology for chart analysis and qualitative methodology for the interview analysis. The resulting data is analyzed to create meaningful metrics and insights about the impact of Spotify on national language music.

5.1. Chart analysis

The analysis approach will be quantitative for the first part of the study and will focus on giving meaning to the obtained data by analyzing it with statistical metrics. The goal of the chart analysis will be to statistically indicate the presence of national language songs in music charts. To entirely cover that aim, this analysis will first present the general view of music languages in a Global and European scope, and then the scope will be narrowed down to analyze national language presence in European countries, and, finally, the Spotify chart trend will be compared to the radio chart trend to detect any possible differences.

5.1.1. The Bigger Picture

To contextualize results in a local scope it is first necessary to understand which is the global reality of the languages in music charts. For that purpose, the historical data from the Spotify Weekly Top Songs Global chart has been collected from the last week of 2016 - the earliest date of this chart - to the last week of 2023 (Spotify, 2024d). The obtained chart songs have been grouped by lyrics language to display Figure 4, which showcases the lyrics language distribution in the top 20 songs of the Spotify Weekly Top Songs Global over time:

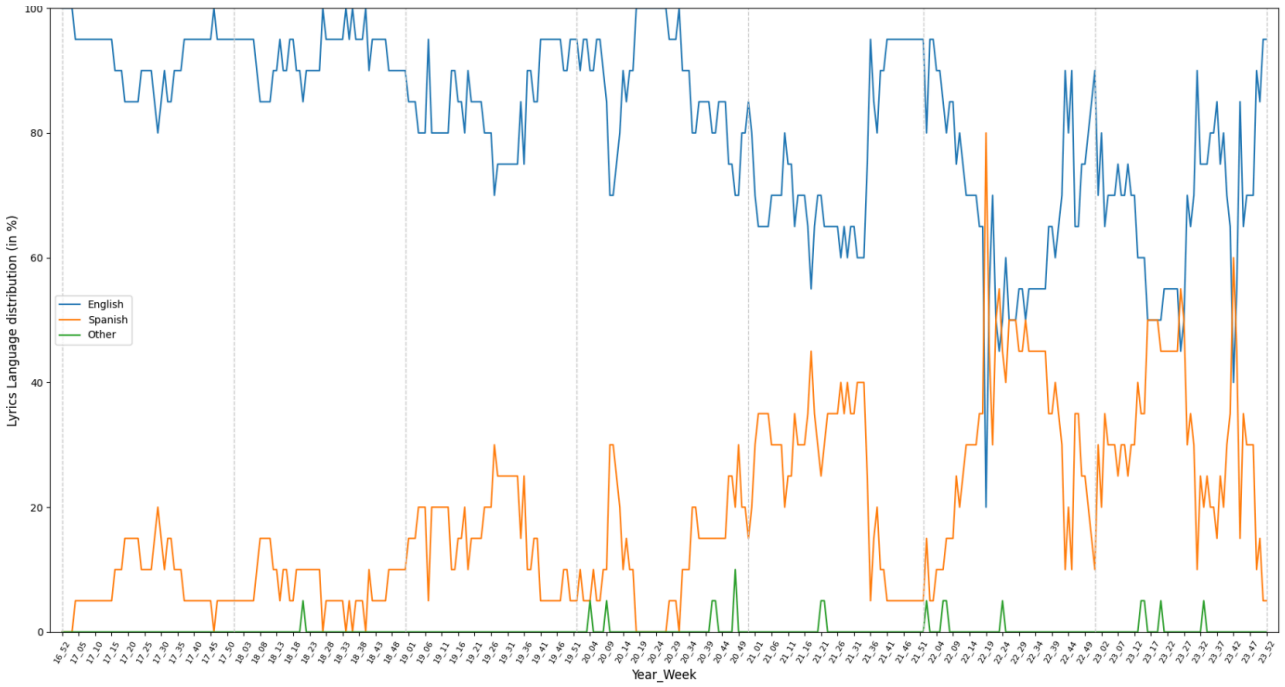

Figure 4: Lyrics language distribution in the Spotify Weekly Top Songs Global.

Overall, Figure 4 shows a distribution totally dominated by English and Spanish and without the presence of any other languages for the majority of weeks. Music in English has clearly been most present in the charts, but Spanish presence has increased in recent years and even taken over English as the most present language for some weeks.

The data in Figure 4 confirms the position of English as the lingua franca of the world and also in the music context. With an average presence of 81.3%, English dominates the lyrics in the top 20 songs of the Spotify Global chart every week since 2016 except for four weeks: 22_19, 22_23, 23_26, 23_42. In each of these four weeks, English was always taken over by Spanish music due to the massive presence of Bad Bunny - the most streamed Spotify artist in 2020, 2021, and 2022, and the first Spanish speaker to achieve it in history (Wikipedia, 2024d). This Spanish music surge is clearly reflected in the charts. Spanish music had a weak presence in the first years of the top 20 Spotify Weekly Global chart - averaging a 7.5% presence over 2017 and 2018. However, especially in the last three years, the distribution trend has changed, going downwards for the English language and upwards for the Spanish language - averaging a 29.3% presence of Spanish songs over the last three years. This fact, however, can't be considered a change of paradigm in language colonialism as Spanish, the second language in the world in terms of native speakers (Lane, 2024), should be considered a majority language in the global context. Besides English and Spanish, the other languages only got a few specific appearances in certain weeks. Mainly from music in the Korean

language, these appearances only reached a maximum of 10% of chart presence in the 20_48 week and didn't follow any notable distribution trend.

Therefore, the top 20 Spotify Global weekly charts are dominated by two major languages, English and Spanish, which are two of the four most spoken languages worldwide. Although the presence trend has changed through the years, substituting English presence for Spanish presence, the presence trend of other languages has been consistently low, painting a bigger picture that does not predict any optimistic future for minority languages, and that could be reflected in the Europea charts.

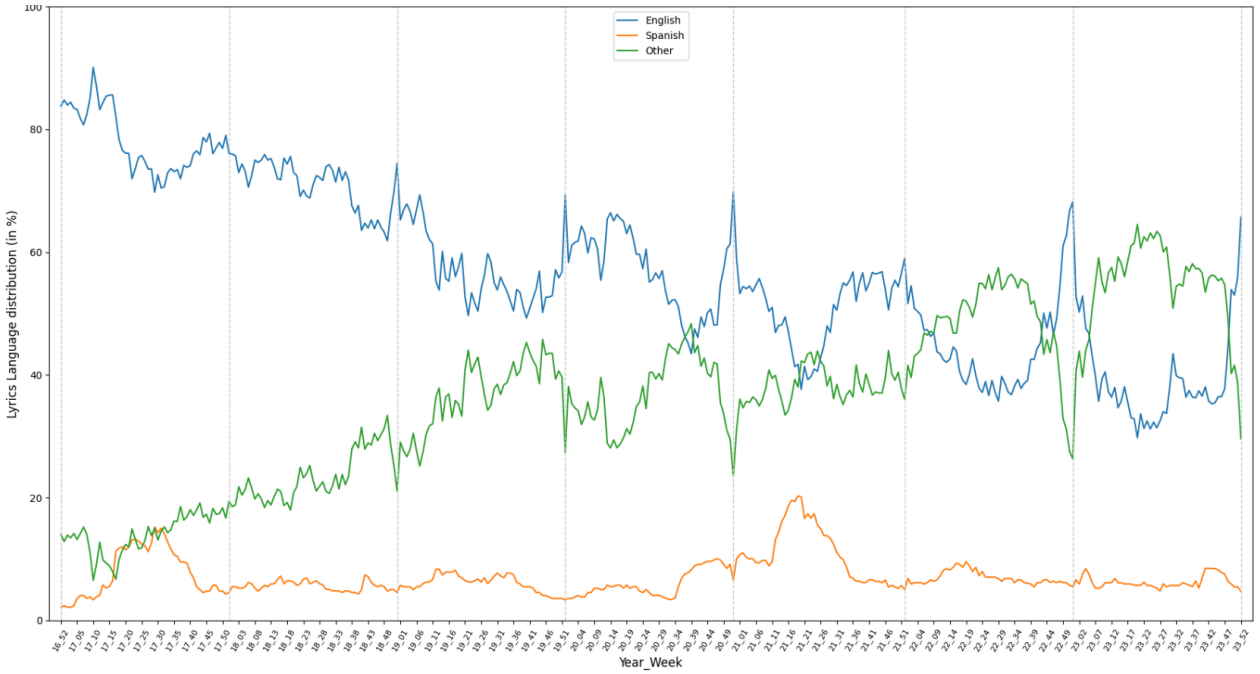

Figure 5: Lyrics language distribution in the European Spotify Weekly Top Songs charts.

Narrowing the data down to the European scope of this thesis, the Spotify Weekly Top Songs charts of 31 European countries - all the European charts that Spotify supports. Following the same methodology, the languages of the top 20 songs in all European Spotify charts have been retrieved, and the distribution trend of those languages has been measured from the last week of 2016 to the last week of 2023.

As appreciated in Figure 5, English is majorly present in the European Spotify charts. However, this presence has been a downward trend over the last years where Other European languages besides English and Spanish have increased their presence in the European Spotify charts even having, for various weeks, more presence than English. The Spanish presence has

been consistently low over the years, far from the presence levels that the English and other European languages have reached.

Specifically, the data of Figure 5 shows that at the beginning of 2017, the presence of Spanish and Other European languages was similar - with around 15% presence - while the music in English was clearly dominating the charts - with around 75% presence. During the following years, English has been the most present language in the European Spotify charts, but this presence has gotten weaker - from an 84% presence in 2016 to an average of 41% presence in 2023. The cause of this weakening has been the increasing presence of Other languages besides Spanish and English in the European Spotify charts - from a 16% presence in 2016 to an average of 52% presence in 2024. The grouped presence of these Other languages overcame English presence for the first time at the end of 2020 and, for the last two years, has been, on average more present than the English language in the Spotify Charts. The presence of Spanish has consistently moved around 10% and has always been lower than the presence of English, and only in 6 weeks of 2017 was it higher than the group of Other languages.

Therefore, the language distribution in the European charts presents a reality where English is the main dominator, Spanish has a consistently minor presence, and Other languages are taking over English dominance with an increasing presence trend over the years.

Comparing the Global to the European charts, it is possible to appreciate the different realities of language distribution. In both scopes, English is dominating, with a presence that, in both cases, has diminished through the years. However, the language taking over the English dominance is different at the Global level than at the European level. While, at the Global level, Spanish is it is Spanish that is threatening English dominance, at a European level, Spanish does not have as much presence and it is the other European languages that are matching the English presence. In general, a trend can be seen where English is losing presence as the lingua franca in the Spotify charts, and while at a Global level, the English presence is replaced by another majority language such as Spanish, at a European level, it may be that the minority national languages are gaining more and more strength.

For this reason, it is especially interesting to analyze the Spotify charts of the European countries individually and explore the presence of the national language at both the national and European levels.

5.1.2. European National Languages in Spotify

The European Spotify charts have been analyzed individually to study how the presence of national languages has evolved through the years in a European context dominated by the English languages. While in some European countries, the national language is English or Spanish, in other countries, the national languages are less popular in terms of the number of speakers. Considering both cases is interesting to analyze to have a complete view of all casuistics of national language presence.

For that purpose, the top 20 songs of the Spotify Weekly Top Songs charts of 31 European countries from the last week of 2016 to the last week of 2023 have been used. Their songs have been categorized as national if their lyrics are in one of the country's official languages and as non-national otherwise (see official languages in Table 2). Using that data, the presence of national language songs has been calculated for each European country and the average of those calculations depicts the European situation.

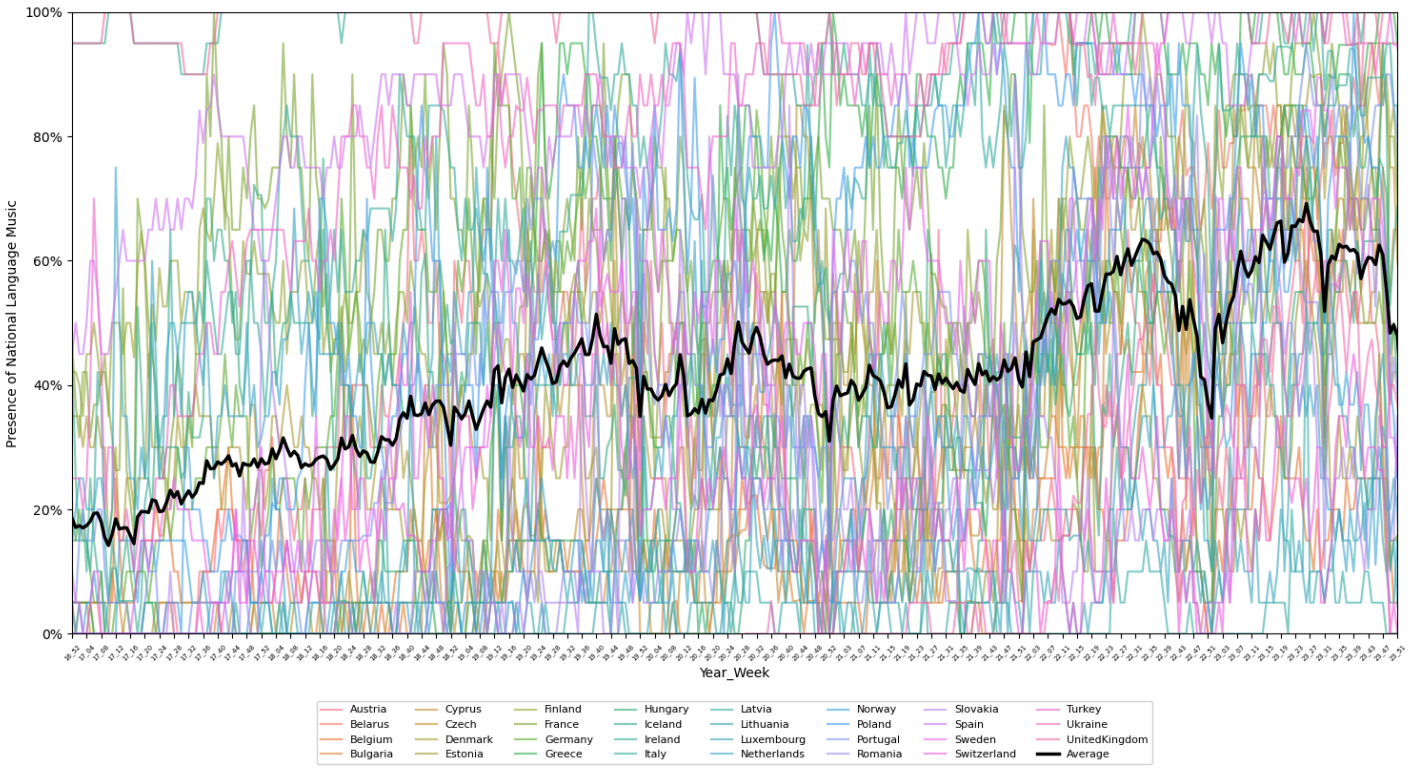

Figure 6: Presence of National Language Music by Country in the Spotify Weekly Top Songs chart.

The weekly chart presence of national language songs has been plotted for all 31 European countries in Figure 6. Although it was first considered to show the European average line only, the trendline of each of the 31 European countries was also plotted to have a variance reference. The data in Figure 6 shows a heterogeneous presence of national languages in

different European countries. To find meaning among the data noise, the average of those 31 presences has been calculated (see Methodology for detail), depicting an upward trend of the national music presence in the European Spotify Weekly Top Songs charts.

This average presence of national language music started with less than 20% in the early weeks of 2017, but through the years, it has continuously increased, reaching a maximum of 69% in week 26 of 2023. Although every year there is a decrease in the presence of national language music in the Christmas weeks, the upward trend of the European average confirms the growing presence of national language music in the European Spotify Weekly Top Songs charts. However, as appreciated in Figure 6, the presence has a high variance between different European countries, which have different languages - some more popular than others - as official languages. Therefore, from a language colonialism perspective, it is interesting to study whether national languages are more present in the country's music charts depending on their popularity.

To study the influence of national language popularity on national language chart presence, the 31 European countries have been divided into two groups: the minor national language countries (MinLC) and the major national language countries (MajLC). The classification of European countries into one of these groups has been done by using a language popularity threshold (see Methodology for detail). The MajLC group contains all countries with a national language that exceeds 40 million native speakers at the European level - Russian, German, French, Italian, English, and Spanish - and the MinLC group contains all the remaining European countries where all their national languages are below 40 million native speakers. Therefore the distribution of the groups is as follows:

Group	Countries
MajLC (>40M)	Austria, Belarus, Belgium, France, Germany, Ireland, Italy, Luxembourg, Spain, Switzerland and United Kingdom
MinLC (<40M)	Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Iceland, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Sweden, Turkey and Ukraine

Table 3: Classification of Spotify European countries by popularity of their national languages.

The national language music presence of each group has been calculated by averaging the national language presence in the Spotify Weekly Top Songs charts of each of the countries that are part of that group. The data of both groups has been plotted in the same chart - from the last week of 2016 to the last week of 2023 - to appreciate the difference between both

groups presences and the European total average has also been included in the chart for reference.

The resulting chart is represented by Figure 7 where is easy to appreciate how the countries with a majority national language have a higher presence of songs in national languages than the countries where the national languages are languages not so widely spoken. A difference, however, that has been reduced over the years.

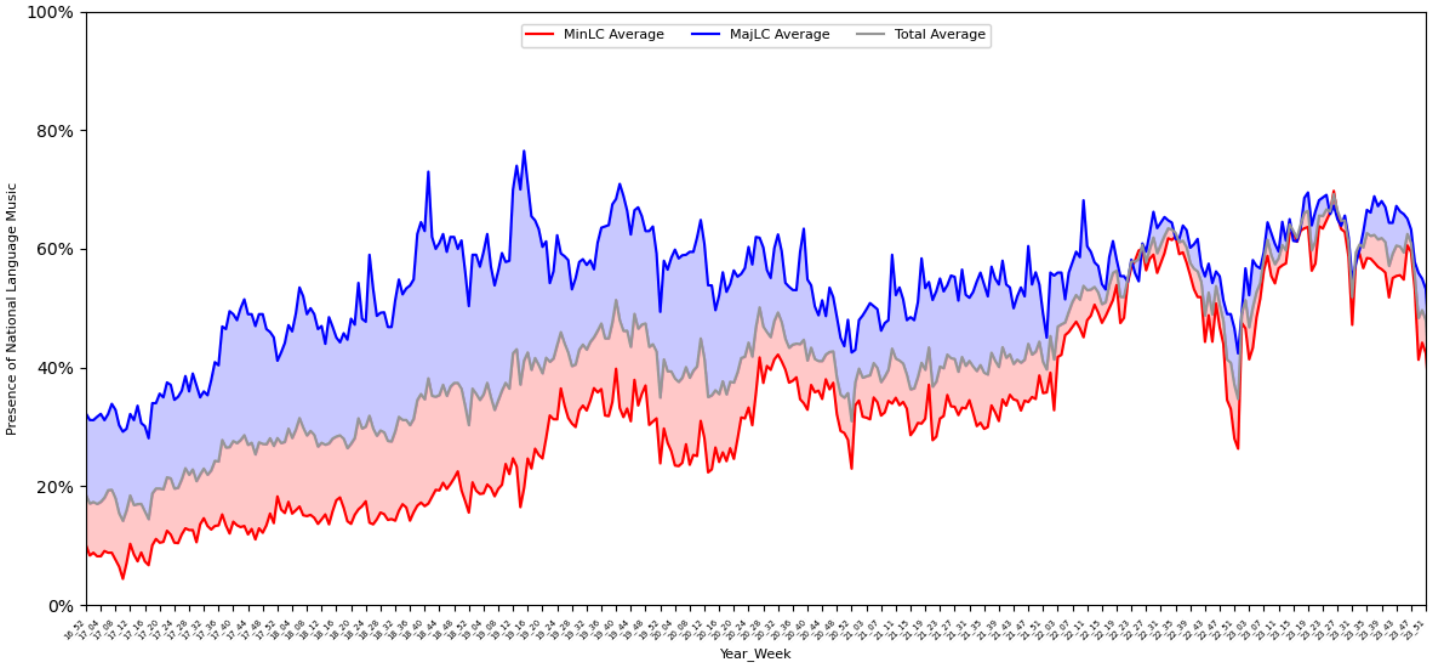

Figure 7: Presence of National Language Music in the Spotify Weekly Top Songs chart for European MinLC and MajLC

In more detail, from 2016 to 2021, the difference between the two groups is evident. The national language presence in the Spotify Weekly Top Songs chart of majority language countries (MajLC) is more prominent than in minority language countries (MinLC) in every single week of 2017, 2018, 2019, 2020, and 2021. This difference, which reaches a maximum difference of 56,8% in week 15 of 2019, progressively gets smaller over the years. From 2022 to 2023, there is almost no presence gap between the two country groups, and in 8 specific weeks of that period, the presence of national languages in MinLC charts is even higher than in MajLC charts. The evolution of this difference is a result of the presence of trends in each country group, which have individually evolved. The average presence of national languages in the Spotify Weekly Top Songs charts of MajLC followed an upward trend during the 2017-2019 period, reaching a maximum presence of 76.5% in week 15 of 2019. However, since that national language presence started a downward and stabilization trend that lasted until 2023, where the upward trend seems to be back but still without overcoming the high presence values from 2018 and 2019. Regarding the MinLC, the presence of its national

languages in the Spotify Weekly Top Songs started with very low values, reaching a minimum of 4.42% presence in week 10 of 2017. Nevertheless, since that week, the national language presence in MajLC charts has had a continuous upward trend that majorly escalated in 2022 and 2023 - with the exception of the Christmas weeks.

Overall, the data in Figure 7 indicates that the popularity of the country's national languages is used to influence its presence in the national charts. However, since 2022, that logic changed; national language popularity is no longer a decisive factor for its presence in national charts, not only due to the presence reduction of national languages in MajLC charts but especially because of the substantial growth of national language presence in MinLC.

The results on national language presence in European charts and the insights on the influence of language popularity in that presence provide an understanding of the actual situation of national languages in the Spotify European and Global charts. However, to assess the impact of Spotify on national language music, it is key to abandon the Spotify context and investigate the presence of differences in those languages in charts that are far from the influence of music recommender systems: the commercial charts.

5.1.3. The Commercial Chart Perspective

For a complete understanding of Spotify's impact on national languages, it is crucial also to assess the situation outside the Spotify context. The Spotify Weekly Top Songs charts are defined by the most popular songs played over the last week in a certain region (Spotify, 2024b), and, besides an active song selection by the user, this music consumption is defined by a recommender system and its cultural and commercial biases. Therefore, to assess a possible algorithmic influence, national language presence was also studied in the commercial charts. By including radio airplay and sales figures in their song ranking system, the commercial charts are not directly affected by the Spotify recommender system and, therefore, are more independent of the algorithmic influence and its biases, providing an insightful comparison reference to the Spotify charts.

To analyze the situation of national languages in commercial charts, the global context must also be explored. For that purpose, the weekly top 20 songs from the Mediatraffic Global chart have been retrieved from 2004 to 2023. Mediatraffic crafts this chart using the global streaming (60%), sales (20%), and airplay (20%) figures. Following the same methodology as with the Spotify Global charts, the chart songs have been categorized into three groups based

on their lyrics language - songs in English, songs in Spanish, and songs in Other languages - and their chart presence has been plotted together in Figure 8:

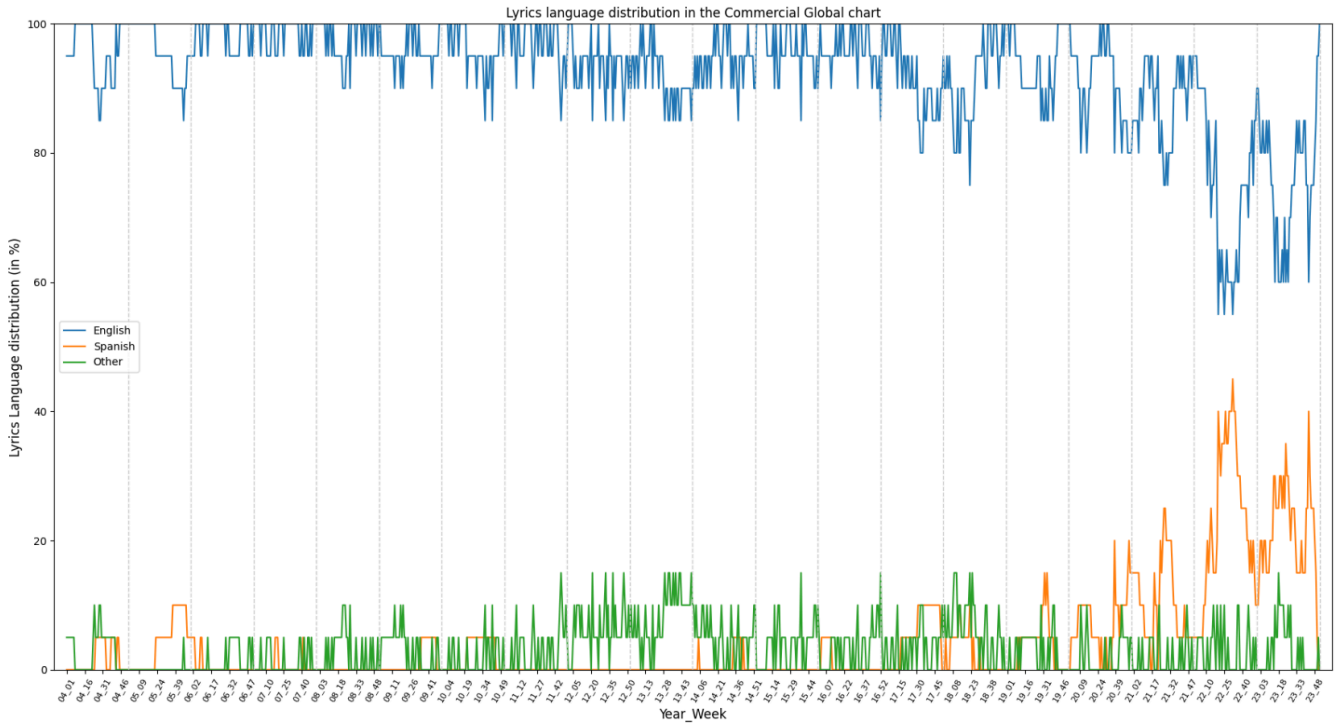

Figure 8: Lyrics language distribution in the Mediatraffic Weekly Global Track Chart.

When analyzing the top 20 songs on the United World Chart by Mediatraffic, a notable dominance of the English language can be easily identified, along with a recent irruption of Spanish and a constant low presence of Other languages.

The average presence of 92.57% in the last 19 years reflects the total dominance of English in the Mediatraffic Weekly Global Track charts, a dominance that has slightly declined in recent years. This decline is caused by an increase in the presence of Spanish in the Mediatraffic commercial chart. Although from 2004 to 2019, Spanish averaged a presence of 1.4%, over the last four years, the average presence went up to an average of 15%, following a trend also observed on the Spotify global chart. In the case of songs in languages other than English and Spanish, the low presence - powered by Japanese and Korean music - has been constant across the years, averaging a 3.2% presence.

Same as in the Spotify case, in the commercial global chart the language colonialism influence can be seen. English has been the dominant language in this chart since 2004, and although its dominance has been reduced in recent years, the stake has been taken by another major language, such as Spanish. Plotting both charts to the same time reference - from 16_52

to 23_52 - showcases the same trend for both charts: English domination and Spanish irruption in the last years. Contrary to Spotify's case, in the commercial global chart, the irruption of Spanish songs never takes over English as the most popular song language in any of the weeks. Also, although the presence of Other languages in the global commercial chart is higher than in Spotify global chart, they still have a minor presence - never reaching more than 15% - compared to English and, in recent years, Spanish. This fact might indicate a poor presence of national language music also in the European commercial charts and to confirmed or refuted by studying the national language presence in 22 European countries.

Compared to the 31 European countries selected for the Spotify European charts analysis, 22 were selected for the European commercial chart analysis because, for some countries, it was not possible to find a commercial chart that includes all music genres, that has a ranking methodology based on radio airplay and sales figures apart from streaming numbers, and that covers a significative chart timeframe (see the selected countries and its commercial chart methodologies in the Chart retrieval section). Therefore, when comparing the European national language presence in Spotify and commercial charts the countries that do not have both a Spotify and a commercial chart has not been taken in consideration. The timeframe of the commercial chart analysis also differs from the Spotify chart data. While the Spotify data started in the last week of 2016, for most commercial charts, it was possible to retrieve data from 2004 to 2023, allowing a more extensive trend analysis. The timeframe difference between the different European commercial charts has also been considered when calculating the national language presence average.

Using the described methodology, the language of the top 20 songs of each of the 22 European commercial charts has been identified and used to calculate the national language presence.. Using this data, the European average presence of national language music has been calculated and compared to the Spotify national language presence in Figure 9:

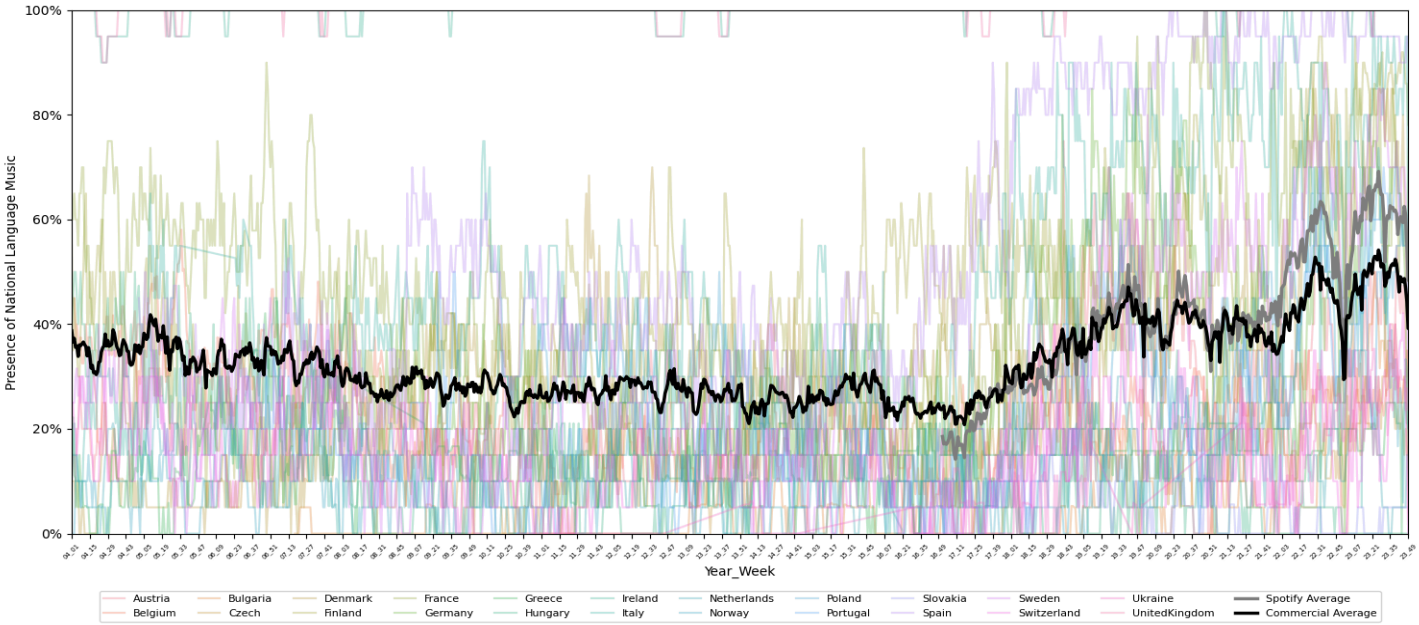

Figure 9: Presence of National Language Music by European Country in Commercial Top Songs charts.

Figure 9 represents an interesting evolution of the national language music presence in each of the 22 European commercial chart where the European national language presence average has changed from a downwards trend to a vigorous upward trend on the recent years similarly following the Spotify national language music presence trend.

Specifically, from 2004 to 2016, the average presence of national language music in European commercial charts experienced a continuous decline - going from a 35% average presence in 2004 to a 24.3% average presence in 2016. However, the trend changed radically in 2017, the same year - besides the last week of 2016 - when Spotify introduced the Weekly Top Songs charts. Since that year, the presence of national language music has continuously increased year over year - from a 25% average presence in 2017 to a 59% average presence in 2023. Comparing the commercial and Spotify national language music presences, both trends have evolved similarly but, in the 2022 and 2023, the presence of national language music has been repeatedly higher in the Spotify European charts than in the commercial European charts.

Therefore, the analyzed data shows that the national language presence in European commercial charts follows a very similar distribution to the presence in the European Spotify charts and that the irruption of Spotify European charts might have influenced the trend change - from downwards to upwards - in the European commercial charts national language presence.

For a complete understanding of the commercial chart reality, the data has been analyzed to asses whether national languages are more present in national music charts depending on their popularity. Following the same methodology as with the Spotify charts, the 22 European countries with commercial charts have been divided into two groups based on the 40-million threshold of native speakers: the minor national language countries (MinLC) and the major national language countries (MajLC), following the distribution of Table 4:

Group	Countries
MajLC (>40M)	Austria, Belgium, France, Germany, Ireland, Italy, Spain, Switzerland and United Kingdom
MinLC (<40M)	Bulgaria, Czech Republic, Denmark, Finland, Greece, Hungary, Netherlands, Norway, Poland, Portugal, Slovakia, Sweden and Ukraine

Table 4: Classification of European countries with commercial charts by popularity of their national languages.

The national language music presence of each group has been calculated, averaging the national language presence in the European Weekly Top Songs commercial charts of each of the countries that are part of that group. The data of both groups has been plotted in the same chart - from the first week of 2004 to the last week of 2023 - to appreciate the presence difference between countries that have a majority of languages (>40M native speakers) as the national language (MajLC) and the ones that have minority languages (<40M native speakers) as national languages (MinLC). The European commercial total average has also been included in the chart for reference resulting in Figure 10.

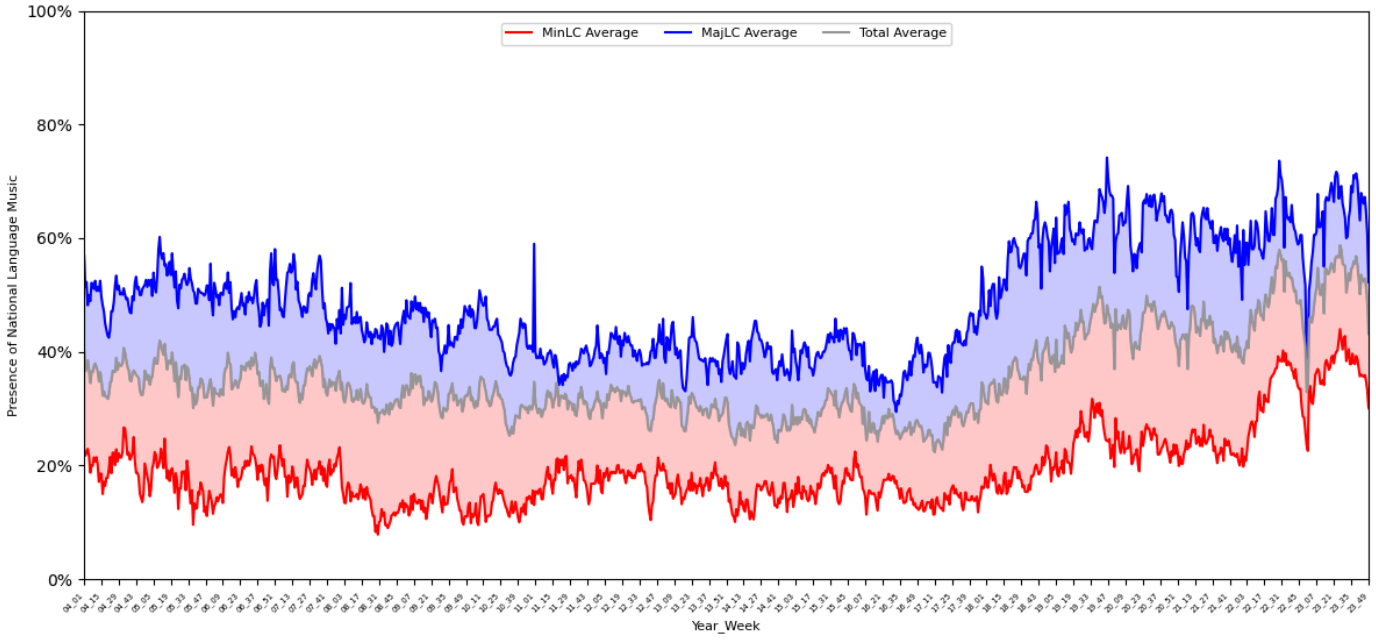

Figure 10: Presence of National Language Music in the Commercial Weekly Top Songs charts for European MinLC and MajLC.

By observing the data in Figure 10, it can be easily appreciated that the presence of national language has decreased and increased proportionally in both European countries with minority national languages (MinLC) and European countries with a majority national language (MajLC).

As previously observed in Figure 4, the presence of national language in the European national followed a downward trend from 2004 to 2016. During this period, the presence of national languages in the charts of both MinLC and MajLC groups has averaged a difference of 27.4% with a standard deviation of 5.9%, a very low deviation considering it includes 12 years of chart data. From 2017 to 2023, the presence trend changed to a progressive upward trend. The national language presence in both groups shifted in the same measure, averaging a presence difference of 33.4% and a standard deviation of 6.7% - very similar values to the ones in the downward trend years.

The national language presence difference between European countries with minority national languages (MinLC) and European countries with a majority national language (MajLC) has been regular over the years. The national language presence in MajLC has been constantly higher than in MinLC, unlike what happened in the Spotify European charts (see Figure 7). Therefore, in the context of European commercial charts, the popularity of national languages has consistently influenced their presence in the charts, even if the total average presence trend has moved upwards or downwards.

5.1.4. Chart Analysis Conclusion

The quantitative analysis of the Spotify and commercial charts has provided valuable insights into the presence of national language music in the European music scene, revealing a complex and evolving landscape, with trends varying across platforms and language groups.

The analysis of Spotify and commercial music charts from 2016 to 2023 reveals significant trends and shifts in language presence. Globally, English continues to dominate the Spotify Weekly Top Songs chart, though Spanish has shown a notable increase, particularly in recent years. This trend is mirrored in the European context, where other European languages have gained a presence, reducing the dominance of English. At the national level, there is a clear upward trend in the presence of national language music in European Spotify charts, with the average presence increasing significantly over the years. Interestingly, the influence of

national language popularity on chart presence has diminished, indicating a more inclusive landscape for minority languages.

Conversely, the commercial charts present a different picture. While the overall presence of national language music has also increased in recent years, the gap between majority and minority language countries has persisted. This indicates that language popularity continues to play a significant role in commercial music consumption, potentially due to factors unrelated to algorithmic influence, such as media exposure and market dynamics. However, the continued dominance of majority languages in commercial charts underscores the challenges faced by minority language music in achieving mainstream recognition.

Overall, the quantitative analysis highlights the dynamic interplay between language, platform, and popularity in shaping the presence of national language music in European charts.

However, while the quantitative analysis has shed light on the evolving landscape of national language music in European charts, it is crucial to acknowledge that numerical data alone cannot fully capture the multifaceted impact of Spotify. The perceptions and experiences of users, who are at the heart of the platform's ecosystem, offer a valuable complementary perspective. Therefore, the following section will analyze the qualitative insights gathered through interviews with Spotify users, exploring their views on how the platform has influenced their consumption of national language music. This analysis provides a deeper understanding of the human dimension behind the numbers, enriching our comprehension of Spotify's role in shaping musical preferences and cultural landscapes and offering a multi-faceted comprehensive assessment of Spotify's impact on national language music consumption in Europe.

5.2. Interview analysis

The second part of the research results consists of a qualitative analysis of 5 interviews with European Spotify consumers. As previously mentioned, the analysis of the Spotify users' interviews is done to explore their perceptions of the impact of Spotify on national language music, providing a contrast to the chart's statistical insights. All the interviews were conducted following a semistructured approach, which led to a conversation that took unique directions for each interviewee. However, all the insights were always revolving around the aim of the second research subquestion:

RQ1.2: How do European Spotify users perceive the impact of Spotify on the national language music consumption?

For an easier analysis, the interview topics have been grouped into three common themes:

Theme	Topics
Spotify Usage and Habits	● Primary platform ● Reasons for choosing Spotify ● Music discovery and exploration
Music Algorithmic Recommendation	● Human vs. algorithmic curation ● Algorithmic potential ● Suggestions for improvements
National vs. Global Music	● Promotion of national music ● Perceived bias ● Contrast with quantitative data

Table 5: Themes and Topics identified in the Spotify consumer interviews.

As seen in the quantitative data, the impact of Spotify on national music consumption can vary depending on the studied European region. For that purpose, the selected interviewees are nationals of a diverse group of European countries: Germany, Norway, Sweden, Greece, and Hungary.

Therefore, the analysis of each theme has been done individually, presenting the most relevant ideas on the topics and joining them for a global assessment of the users' perception of Spotify impact on European national language music consumption. In the first place, the interviewees were asked about their usage of the Spotify platform and their habits when listening to music on the platform, which defines the profile of each interviewee and helps to assess the general characteristics of music consumption in Spotify. Afterward, the focus of the questions was set on the Spotify algorithm, where users shared their perception of algorithmic recommendations by comparing them to human curation, recognizing their potential, and suggesting possible improvements. Finally, the topic has been narrowed down to the aim of this research, and the users are asked about their perception and experience of Spotify's impact on music in national languages.

5.2.1. Spotify Usage and Habits

As the first question, the interviewees were asked about their usage of Spotify - including their longevity as users or the reasons for choosing the Spotify service - and their habits when

consuming music - comparing their active song selection with their use of recommendations and asking about their national language music consumption. The answers have been analyzed to understand why music consumers use Spotify and their platform usage. They have also been used for user classification based on their Spotify usage and listening habits, which is relevant when analyzing insights about other topics.

Spotify is the dominant platform for music consumption among all interviewees. The reasons for choosing Spotify vary, but common factors include convenience, access to a vast music library, and an ad-free experience. The Norwegian user, for instance, mentions that Spotify's prevalence in their social circles influences their choice, while the Swedish user's family connection to the platform's founder makes it a natural default. The Greek user switched to Spotify during the COVID-19 lockdown, appreciating its ad-free experience and lower data usage compared to YouTube. For Hungarian and German users, the convenience of having everything organized in one app is the major draw.

> *"I think I started using Spotify when my parents did. As a kid I might have used iTunes, but in Norway everyone uses Spotify, so you want to do what everyone else is doing." - Norwegian User*

> *"For me, the biggest selling point of Spotify is it's one place where you have access to everything. I just like having one single location where I can listen to everything I care about. I wouldn't buy Spotify only for the algorithm, and I wouldn't buy it only for the network effect." - German User*

Although social factors, convenience, and existing family subscriptions initially drove most users towards Spotify, the recommender system has gradually become an integral part of their engagement with the platform. The Norwegian user, while primarily influenced by Spotify's popularity in their social circles, acknowledges appreciating the platform's features, including the recommendations. Similarly, the Greek user, initially unaware of the recommender system, has grown to rely on it for exploring new music, indicating its increasing importance in their Spotify journey. However, for some users, such as German and Hungarian users, the recommender system was not a decisive factor in their choice of Spotify. The German user prioritizes the platform's comprehensive music library, while the Hungarian user values the convenience of having all their music in one place. The Swedish user, on the other hand, found Spotify's recommender system superior to other platforms they had tried, suggesting that it played a role in their continued loyalty to Spotify.

"Honestly speaking, when I first subscribed to Spotify, I wasn't even aware of this kind of technology. So initially it wasn't a factor. But now, while it's not the main reason I have Spotify, it is a reason to explore new music, especially if you're bored of the same music and want to discover similar artists or genres." - Greek User

"Spotify's algorithm surpasses those of other platforms I've tried. While I've experimented with Deezer, [...] I found that their algorithm didn't quite align with my musical preferences. The recommendations felt less personalized and often didn't resonate with me. In contrast, Spotify's algorithm consistently curates playlists that introduce me to new music within my preferred genres and artists." - Swedish User

While users appreciate Spotify's features like radio, personalized playlists, and algorithmic recommendations, they also express a desire for more personalized and diverse suggestions. The German user regularly uses Spotify's radio function and Discover Weekly playlist but also explores music through YouTube channels and videos. The Hungarian user utilizes Release Radar to discover new music but occasionally finds it lacking in desired songs. In the same line, the Swedish user remarked that, although frequently using the Spotify algorithm, still relies on manual exploration. These opinions suggest that, while Spotify's recommendation features are valued, there is room for improvement in tailoring recommendations to individual tastes and introducing users to a wider range of music.

"I use the radio function all the time, so I have some radio stations for specific genres. The Discover Weekly playlist often has things I like. [...] I think it's helpful to have the algorithm help you shape where you explore, but at the same time, you want to keep your own agency and not be spoonfed everything." - German User

"I use Release Radar to find new music and discover new artists. [...] Sometimes it's frustrating when it doesn't include songs I know are new and want to hear." - Hungarian User

In conclusion, Spotify is the dominant music platform among the interviewees, chosen mainly for social factors and other reasons such as its convenience, vast library, and ad-free experience. While the recommendation algorithm was not an influential factor in choosing Spotify, the users believe that the recommendation system has become increasingly important for music discovery. However, users desire more personalized and diverse suggestions, often supplementing Spotify's recommendations with their own exploration and other platforms

like YouTube. While Spotify's features are valued, there's room for improvement in tailoring recommendations and introducing users to a wider range of music.

5.2.2. Algorithmic Recommendation

Given the importance of algorithmic recommendation in Spotify music consumption, part of the interview questions have been addressed to explore the users' perception of Spotify recommendations. The insights on this topic have been useful to assess the general mood of Spotify users towards algorithmic recommendations compared to human ones and future perspectives. For that purpose, the interviewees were asked about their preferences regarding algorithmic or human curation, the potential of music algorithmic recommendation, and their suggestions to improve these technologies.

The interviewees express a range of views on algorithmic versus human music curation, highlighting the trade-offs between personalization, trust, and discovery. The Norwegian and Swedish users prefer human curation for its potential to understand their unique tastes and provide recommendations with a personal touch, emphasizing the trust and understanding that comes from human relationships. The German user also favors human curation, valuing the "authentic and transparent" interaction with a human music recommender who can observe their reactions and engage in dialogue, finding algorithmic recommendations "vague and intransparent." In contrast, Hungarian users are more comfortable with algorithmic recommendations, as they don't feel pressured to like the suggestions and avoid potential awkwardness with friends.

> *"I'd probably trust human curation because I feel you have more of an authentic and transparent interaction. In a record store, you can get to know the person, and they can see how you react. It feels more organic." - German user*

> *"I believe that human curation would significantly improve the quality and relevance of the recommendations. A human curator could take into account my specific tastes, moods, and the context in which I'm listening to music. This emotional connection is something that an algorithm, no matter how sophisticated, cannot replicate." - Swedish user*

Besides a clear preference for human curation - instead of an algorithmic one - of music recommendation, some interviewees elaborated on their perspective on the consumption of algorithmic recommendations. The German user acknowledges the role of algorithms in

shaping their music exploration but wants to maintain their own "element of curiosity and exploration" using a mix of algorithmic features and active exploration through artist pages and albums. The Greek user, initially unaware of recommendation technology, now uses it to explore new music but still creates their own playlists due to a lack of trust in the algorithm's understanding of their preferences.

> *"I never had a moment where I thought: this suggestion is very bad, now I want to stop. For me, I'm not comfortable with the thought of an algorithm that I don't know and don't understand is shaping my musical exploration. I want to keep my own element of curiosity and exploration in there without being fully guided by some software." - German user*

> *"I mostly create my own playlists because I don't trust the algorithm to understand my preferences." - Greek user*

Although inclining towards human curation, the interviewees generally see the potential for algorithmic recommendations to evolve and improve. The Norwegian user expresses optimism about the potential of algorithms to evolve and improve, potentially reaching a point where they could offer tailored recommendations like a trusted friend. Likewise, the German user envisions a future where AI-powered recommendation engines could replicate the experience of interacting with a knowledgeable human music recommender, but is still doubtful that algorithmic interaction could reach the same comfort as a face-to-face conversation. The Greek and Hungarian users also remained optimistic, believing that algorithmic recommendations have the potential to improve and become more personalized with better data and user feedback. Finally, the Swedish user also anticipates algorithmic recommendations becoming more sophisticated and personalized, potentially surpassing human curation in the future.

> *"I think in the future it's definitely possible that the algorithmic recommendations could become better, and maybe even reach the point where they are as good as a human." - German user*

> *"I think it's definitely possible that the algorithm could one day surpass human curation. As technology advances, it's possible that algorithms will be able to understand our tastes and preferences even better than we do ourselves." - Swedish user*

Furthermore, the interviewees also gave insights about how the recommendation algorithms could improve their performance. While the Norwegian user envisioned a questionnaire that captures users' personalities and music-listening goals to refine recommendations, the German user advocates for increased transparency in how recommendations are generated, enabling users to understand the underlying logic.

> *"I think it would be better if they made it more personal, maybe even a questionnaire so I could give them my preferences... Maybe it should give me a variety of music for different occasions because what you want to listen to at a party is different from what you want to listen to when you're working. And I think it would be nice to see what kind of personality I am. Am I an extrovert or an introvert? Do I want upbeat music, or am I more of a calm person?" - Norwegian user*

> *"I would like to have more transparency in the algorithm's decisions, so it's not this black box where I don't know what's happening. I want to understand why they're recommending certain songs to me...I'd also like to be able to say, 'I don't like this artist or genre, and I don't want to see them anymore.'" - German user*

The Greek and Hungarian users also have a similar opinion on a potential improvement based on increasing the exposure of users to a wider range of music beyond their usual preferences. On the one hand, the Greek user suggests a system where music from different countries is recommended based only on individual tastes and preferences beyond the language dimension. On the other hand, the Hungarian user proposed a "surprise me" feature to introduce new artists and genres. For the Swedish user, the key is in the data, and proposes that Spotify leverages user data more effectively to offer truly personalized recommendations.

> *"I'd love to have a feature where I could explore music in the same genre but from different countries. It would be great to hear how the same type of music is interpreted in different cultures." - Greek user*

> *"I think they could improve by not being so predictable. Sometimes I want to be surprised. They could have a 'surprise me' feature that would introduce me to new artists or genres I wouldn't normally listen to." - Hungarian user*

"I think Spotify has a lot of data on me, but I don't think they use it effectively enough. If they could analyze my listening habits more closely and understand what I really like, they could offer me much better recommendations." - Swedish user

Overall, the interviewees express a strong preference for human-curated music recommendations, citing the personal touch, personalized understanding, and trust that comes with human interaction. They feel that human curators can better grasp their individual tastes, moods, and listening contexts compared to algorithms. However, they acknowledge the potential for algorithmic recommendations to improve and become more personalized by incorporating user feedback, increasing transparency in the recommendation process, and expanding the range of suggested music beyond their usual preferences. The interviewees, while skeptical of the actual algorithmic recommendations, believe that by bridging the gap between human curation and algorithmic capabilities, Spotify can create a more satisfying and personalized music discovery experience for its users.

5.2.3. National vs. Global Music

While interviewees appreciate Spotify as a platform for its convenience and vast music library, they express a shared concern that the algorithm favors global, particularly English-language, music, often overshadowing national artists and genres.

Hence, a third group of questions arise during the interview. These questions tried to capture one of the research aims stated in the research subquestion RQ1.2.: the user perception of the Spotify impact on national language music. For that purpose, the interviewees were asked about their consumption of national language music and its representation in Spotify recommendations. After sharing their perceptions of a possible language bias in Spotify, the interviewees contrasted their opinions with the national language presence data retrieved from the chart analysis. With this procedure, it has been possible to assess how different is the user perception from the actual data and which are the reasons for this potential difference.

The desire for greater visibility and representation of national music on Spotify is a recurring and deeply felt theme among the interviewees. The Norwegian user, while enjoying a mix of Norwegian and American music, actively seeks out more Norwegian rap but finds it rarely recommended by Spotify's algorithm. Furthermore, the Norwegian user states that music in Norwegian is definitely underrepresented in the obtained recommendations and believes that Norwegian music might receive fairer treatment on other channels like radio.

“I definitely listen to more [music in Norwegian] than I'm recommended. It's been a while since I've explored new music on Spotify, but I haven't noticed getting a lot of Norwegian music recommended, even on my Norwegian playlist.” - Norwegian User

The German user also believes that radio stations offer more language diversity in their recommendations than Spotify. For the German user, listening to the radio feels like traveling mentally to the whole world while Spotify just shows what will keep the user listening longer.

"The radio station I listen to plays very diverse music. I often save songs because they're so cool and different. It feels like one of their goals is to reflect a diverse view of music. Comparing that to Spotify, Spotify feels much more mainstream and less diverse." - German User

Regarding German music, the German user almost never consumes songs in German but still expressed the impression that German radios - probably to promote local artist or to meet a quota - play more German songs than Spotify, which seems more centered towards Global artists.

“I'd expect German radios to play more German songs than Spotify. From my experience, Spotify seems to draw you more towards global artists than local ones. I feel like German radio stations have a stronger sense of promoting local artists, maybe even a quota.” - German User

The Greek user brings a similar perspective. While he recognizes the presence of Greek music in the Spotify recommendations and charts, he still thinks Greek artists are not “as much promoted as they should be”. The Hungarian user, deeply involved in their local music scene, observes a lack of recommendations for new Hungarian music despite their listening habits, mostly finding national music recommendations only in Hungarian playlists.

"I don't think I get many Hungarian recommendations, maybe almost none in the Release Radar. I know Spotify has Hungarian playlists, but I haven't seen many recommendations in other places. [...] It could be due to the "long tail theory," where popular songs get amplified and smaller artists struggle to gain listeners. My friends in the music industry have said it's difficult to get into playlists, but if they do, their songs become significantly more popular." - Hungarian User

“Greek isn't as widely spoken as English or Spanish, so it's difficult for Greek artists to establish themselves in the global music industry. That's why we don't have many big Greek artists who've conquered the world." - Greek User

The Swedish user, while actively seeking out Swedish music, finds it harder to discover on Spotify compared to internationally popular genres such as American music and turns to radio stations to satisfy their desire for cultural connection through music. She believes that this phenomenon is not only exclusive to the Swedish language but to all the non-English languages.

It's undeniable that my Spotify experience is heavily skewed towards American music. I believe that this bias is not just limited to Swedish music but extends to other non-English languages as well. I feel that Spotify's algorithm tends to favor globally popular music, often at the expense of local and niche genres. - Swedish user

Interestingly, all users recognized a certain degree language unfairness in Spotify and believed that their national language music is underrepresented and even signaled that the cause must be an overrepresentation of popular language music such as English music. However, quantitative data on local music presence in Spotify's charts offers a contrasting perspective, causing surprised reactions from the interviewees.

The Norwegian user, while acknowledging the data, expressed that the globalized presence of English in social media must have guided the wrong assumption that it is also happening in the Spotify context. And, although being more confident with Spotify recommendations after seeing the chart data, she still needs to personally experience the change to fully believe it.

I don't get recommended enough Norwegian music, but I don't know if I should just because I'm Norwegian. It's interesting to see that this is happening in the top charts. [...] Maybe it's just what I'm used to, so I still feel like it's that way. And even though my friends and I might listen to a lot of Norwegian music, everything on social media is usually in English. So we might feel like the whole world is in English, even though it's not. - Swedish user

The German user was surprised to learn about the substantial presence of German songs on the German charts, admitting, "The graph changed my opinion; it's better than I thought." and recognizing Spotify as a fairer platform for national language. However, he still remained hesitant about the language fairness of his recommendations, suggesting a need to examine more localized data for a comprehensive assessment.

> *I feel Spotify is a bit more fair than I expected. 50-60% of German songs on the charts are higher than I thought. The graph changed my opinion; it's better than I thought. I was influenced by the concept of the 1% economy and the long tail, where there are few winners and many losers. - German user*

In the same line, the Hungarian user found the data "very surprising," as it didn't reflect her personal experience on Spotify. After acknowledging the positive trend in Hungarian music chart presence, she affirmed being more confident with the recommendation fairness and will pay attention to future recommendations to assess if she got the right impression.

> *I'll trust them more, but I'll also pay closer attention to see if it reflects this trend in my own recommendations. I want to understand if I'm getting more Hungarian music suggested now. - Hungarian user*

The Swedish user also found the data “surprising” and “encouraging”. Although she was expecting a Swedish presence in the charts, the positive presence trend surpassed her expectations. The Swedish user suggests that Spotify could have joined the growing effort to promote local artists and while still skeptical, the positive data makes her more inclined to give the Spotify recommendations another chance

> *The data showing the increased presence of Swedish music in the charts is certainly encouraging. It suggests that Spotify's algorithm might be evolving to better cater to local tastes and preferences. While I remain somewhat skeptical, this data does make me more inclined to give the algorithm's recommendations another chance. - Swedish user*

Finally, the Greek user also acknowledges the increasing presence of music in Greek in the Spotify charts. However, unlike the other interviewees, he is not surprised by this trend as it is totally comprehensible given the low English literacy of the new Greek Spotify users and the cultural roots that Greek music has in their culture.

> *The low numbers at the beginning make sense because Spotify wasn't popular in Greece until later. The increase reflects that Greek people listen to a lot of Greek music. It makes sense, and there are a few reasons for this. First, we have unique music styles like Rembetiko, which is a traditional Greek genre with bouzouki, that people still listen to. Second, many people in Greece don't know English well, so they can't relate to English music as easily. - Greek user.*

In a nutshell, the interviewees demonstrate a strong connection to their local music scene, actively seeking out and valuing artists and genres that reflect their cultural identity. While Spotify is recognized for its convenience and vast music library, a common concern is that the algorithm prioritizes global music, potentially overshadowing local talent. This perception, however, is contrasted by the quantitative data showing a significant increase in local music presence on Spotify's charts. The data sparks a shift in perspective, with interviewees acknowledging Spotify's efforts in promoting local music but also highlighting the need for further improvement in personalization and diverse recommendations. However, the data also highlights a disconnect between the platform's overall trends and individual user experiences, as some interviewees were surprised by the results and still feel that their personal recommendations do not adequately reflect the diversity of local music.

5.2.4. Interview analysis conclusion

The interview insights review the crucial role, and therefore the big impact, of the Spotify algorithm in music consumption. Although the music algorithm was not the main reason for choosing Spotify, the interviewees recognized its presence in their music listening. In general, the interviewees perceive the Spotify recommendations as non-diverse and lacking personalization, making them more inclined to a human music curation but acknowledging a Spotify potential that could be exploited with more user feedback, greater transparency, and diverse recommendations. Spotify unfairness is perceived by users in the language dimension where they observe an underrepresentation of national language music that is contrasted by the positive numbers on the chart presence of those languages.

Overall, it is possible to appreciate a complete dissonance between the consumer perspective and chart data that, although being acknowledged by the interviewees, still generates skepticism on being reflected in their actual listening recommendations. Therefore, it is necessary to situate users' perspectives within the knowledge framework to understand the

motives of this dichotomy between the user perception and the chart data to assess the impact of Spotify on national language music consumption.

5.3. Analysis conclusions

In conclusion, this study paints a multifaceted picture of the impact of Spotify on national language music consumption in Europe. The complex Spotify situation, reveals a tension between the increasing presence of national music on charts and user perceptions that often lean towards a dominance of global music.

While quantitative data reveals an increasing presence of national language music in Spotify charts, user perceptions often diverge from this reality. Many users express concerns about the dominance of global music, particularly English-language tracks, and the underrepresentation of local artists in their personalized recommendations. The findings underscore that while Spotify has undoubtedly created a platform for national language music to reach wider audiences, there remains room for improvement in ensuring equitable representation and visibility for local artists within personalized recommendations that are noticed by the consumers.

Overall, the general research findings can be summarized to:

Quantitative findings
Spotify Global language distribution: ● The Spotify Global chart has been dominated by the majority of languages (with Spanish progressively taking over English as the dominator) with a nearly non-existent representation of Other languages.
Spotify European language distribution: ● The average language presence in European charts is also dominated by English. However, in the European case, the presence of English is being overtaken by other languages besides Spanish.
National languages in Spotify: ● The average presence of national languages in the Spotify European charts has majorly increased over the years (from 20% in 2016 to 75% in 2023). ● The national language presence in Spotify charts used to be correlated to its popularity. However, in the last years, that presence of minority national languages and majority national languages has become nearly the same, closing the gap and ruling out the popularity correlational factor.
The commercial chart perspective: ● The language distribution of commercial Global charts is similar to the Spotify case, with an even higher English dominance.

● The national language presence trend has shifted from a decreasing to an increasing presence, with the turning point matching the irruption of Spotify in 2016. ● The popularity of a national language influences the presence of its presence in the commercial charts as well. Unlike in Spotify, where the popularity of a language has ceased to influence its chart presence, in the commercial charts this correlation has not changed through the years.
Qualitative findings
Spotify Usage and Habits ● Spotify is the dominant music streaming platform mainly chosen for social lock-in factors. ● The Spotify RecSys was not a selection reason but has become important for users' music discovery. ● While users value and use Spotify features, they lack personalization and diversity in Spotify suggestions.
Algorithmic Recommendation ● Strong user preference for human-curated music recommendations instead of algorithmic ones. ● User acknowledgment of Spotify's potential could be exploited through user feedback, transparency, and more diverse recommendations.
National vs. Global ● Users, usually with a strong connection to national music, perceive an underrepresentation of it in Spotify, which is perceived to favor foreign English music. ● The chart data surprised the users, contrasting their perceptions. While users feel more confident about Spotify recommendations after seeing the data, they are still skeptical that this fairness is reflected in their daily recommendations and consumption.

Table 6: Summary of quantitative and qualitative findings.

Although insightful, the quantitative and quantitative findings need to be contextualized within the external reality of the topic to extract conclusions robust enough to answer the research question. For that purpose, in the next section, the results obtained are integrated with the knowledge framework created by the literature review and theoretical framework to provide a robust explanation of Spotify's impact on national language music consumption.

6. Discussion

The purpose of this discussion chapter is to interpret and analyze the research findings, providing a deeper understanding of their implications and significance. By connecting these results with existing literature and theoretical frameworks, this discussion aims to place the research findings within the broader academic conversation, which not only validates the research but also contributes valuable insights to ongoing debates about cultural globalization, linguistic imperialism, and biases in music recommender systems.

To set the stage for this discussion, it is essential to revisit the complex landscape that this thesis aims to address: the impact of Spotify's emergence on the consumption of national language music. This landscape is characterized by the intricate interplay between cultural globalization, linguistic imperialism, and algorithmic bias within music streaming platforms. On one hand, scholars such as Alaminos Fernández (2023) argue that globalization homogenizes musical tastes, favoring major cultures. Conversely, others like Fernandez (2009) and Baltzis (2005) propose that globalization fosters glocalization, where global trends intertwine with local expressions. The linguistic dimension adds another layer of complexity, with researchers like Mufwene (2008) and Phillipson (1992) suggesting that English dominance in popular music constitutes linguistic imperialism, while Datta et al. (2017) argue that platforms like Spotify empower diverse linguistic expressions.

Additionally, the role of recommender systems in shaping musical preferences is a contentious issue. Some scholars, including Abdollahpouri et al. (2020) and Turnbull et al. (2022), suggest that these systems amplify social biases, favoring popular artists and marginalizing niche creators. However, Levy & Bosteels (2010) challenge the universality of popularity bias, and Datta et al. (2017) posit that platforms like Spotify can broaden musical horizons and benefit smaller artists.

Despite the complex and often contradictory nature of existing research, this thesis aims to illuminate this landscape by integrating the objective quantitative and qualitative results obtained in this study with the existing academic knowledge. To achieve this, the following sections will consist of a focused discussion of the research questions, specifically examining Spotify, its charts, and the consumption of national language music.

As the scope of the main research question was divided into two research subquestions for better granularity, the research discussion will focus first on each subquestion individually and then join both assessments to answer the main research question.

6.1. National language presence in Spotify charts

The first research subquestion represents the research aim of assessing the Spotify impact on national language music from a quantitative perspective. Bearing in mind the European scope of the study and considering music charts as the best tool to measure the relevance of a song, the following research question is discussed:

RQ1.1: How has the emergence of Spotify affected the presence of national language music in European charts?

The analysis of European music charts reveals a transformative shift in the landscape of national language music consumption, both in music streaming and radio charts, commencing around 2016. This shift echoes the foresight of Achterberg et al. (2011), who, while not finding a clear pattern in the consumption trends of the United States, the Netherlands, France, and Germany, recognized the disruptive potential of streaming platforms.

Complementing Achterberg et al. (2011)'s study, this thesis unveils a distinct trend: the presence of national language music in European charts was on a steady decline until 2016, after which it experienced a major resurgence, a trend that continues to this day. The year 2016 marks a pivotal moment, coinciding with the widespread adoption of music streaming platforms led by Spotify. As Hesmondhalgh (2021) notes, this year represents a turning point for the music industry, with streaming becoming a global phenomenon. The music consumption market witnessed its first revenue increase in a decade, driven by the rapid growth of streaming subscriptions from 2015 onwards.

This transformative effect is mirrored in the findings of Datta et al. (2017), who documented a significant and persistent rise in music consumption following Spotify's arrival. The data clearly demonstrates Spotify's pivotal role in reversing the downward trend of national language music consumption and propelling it upwards. Even commercial music charts, independent of Spotify, appear to have been influenced, mirroring the increasing presence of national language music observed on Spotify's charts.

Exploring the language distribution across Spotify's charts confirms the dominance of English, in accordance with Phillipson's (1992) assumptions of English linguistic imperialism. However, this dominance is gradually declining, making way for other, less popular European national languages. This resurgence of linguistic diversity aligns with Lesota et al. (2022) observation that local music often coexists and interacts with global influences, suggesting that Spotify may foster a more inclusive environment for diverse musical expressions.

Furthermore, the analysis sheds light on the role of popularity bias. While the popularity of a national language still influences its presence in commercial charts, this correlation has diminished on Spotify. This suggests that Spotify's algorithm if it influences national language music consumption, does so without succumbing to popularity bias, offering a more level playing field for diverse linguistic expressions.

In conclusion, the emergence of Spotify has fundamentally transformed the presence of national language music in European charts. The platform's arrival in 2016 marked a turning point, reversing the declining trend and initiating an era of increased visibility and consumption for national language music.

6.2. User perspectives on the Spotify impact

The second research question depicts the research aim of considering a different but also crucial perspective on the impact of Spotify on the national language music consumption: the user perspectives. Bearing in mind the European context of the research, the insights of European Spotify users will be used for an explorative assessment of the following research question:

RQ1.2: How do European Spotify users perceive the impact of Spotify on the national language music consumption?

The users interviewed for this study primarily use Spotify for music consumption, driven by social lock-in factors, and while they did not initially choose Spotify for its recommender system, it has become an important tool for music discovery. However, a recurring theme in their feedback is a perceived lack of personalization and diversity in Spotify's suggestions, potentially leading to a homogeneous and non-personalized music consumption experience. This aligns with Anderson et al.'s (2020) findings that user-driven listening habits tend to be more diverse than those driven solely by algorithms. Additionally, a strong preference for

human-curated recommendations over algorithmic ones was observed among the interviewees.

This perception of Spotify promoting a non-diverse music consumption experience extends to the language dimension, with users expressing concerns about the underrepresentation of national language music. However, users also acknowledge that Spotify has the potential to improve through user feedback, increased transparency, and more diverse recommendations, echoing Afchar et al.'s (2022) emphasis on explainability in music recommender systems.

Focusing specifically on national language music, the interview insights align with Way et al.'s (2020) claim that user-driven listening habits tend to be more diverse than algorithm-driven ones. Users with a strong connection to their national music perceive an underrepresentation of it on Spotify, with a perceived favoritism towards foreign, English-language music.

This perception of English dominance aligns with the chart data, but an interesting divergence emerges when assessing Spotify's impact on other-than-English national languages. Users across the board, regardless of whether their national language is a majority or minority language, perceive an underrepresentation of their local music on Spotify. While one might assume this aligns with the chart data, as users might expect an even higher presence of their national language, this was not the case. Upon being presented with the chart data, users were surprised by the high and increasing presence of their national language, contradicting their perceptions of Spotify causing language homogenization.

Interestingly, this exposure to the chart data led to a more positive perception of Spotify's impact on national languages and increased confidence in its recommendations. However, skepticism remained regarding the reflection of this fairness in their daily recommendations and consumption.

Overall, users tend to hold a more negative view of Spotify's impact on national language music consumption than the data suggests. They perceive their consumption as homogenized by the platform. However, when presented with evidence of Spotify's positive impact on the global representation of national languages, their perception shifts towards a more positive outlook, although skepticism about the local impact persists. This duality of acknowledging the broader positive impact while remaining skeptical about personal experience opens a promising avenue for future research to explore the reasons behind this discrepancy.

6.3. Linguistic Imperialism in the Spotify Era

Having explored the quantitative trends of national language music consumption in Europe and delved into the perceptions of Spotify users regarding this phenomenon, this discussion chapter aims to synthesize the findings from both research subquestions. Drawing connections between quantitative data and user perceptions to paint a comprehensive picture of Spotify's influence, the necessary information is now available to address the overarching research question:

RQ1: How has the emergence of Spotify impacted the consumption of national language music in Europe?

The analysis of language distribution within European music charts, where English, and potentially Spanish, exhibit a dominant presence, suggests a scenario of language globalization, aligning with Steger's (2020b) framework, which posits that globalization involves a decline in the number of languages used for international communication while the rest become the means of global connection at all media levels. In this context, the Spotify Global chart, mirroring trends observed on other digital platforms, indicates that global languages such as English, and increasingly Spanish, are becoming global mediums for musical expression. This observation supports the assertions of Hassi & Storti (2012) and Steger (2020b), who identify media as a catalyst for cultural globalization.

However, as established in the theoretical framework, it is crucial to discern whether this language globalization observed in music streaming is imperialistic in nature, favoring dominant languages, or glocalized, allowing for the coexistence of diverse linguistic expressions. While the global picture may appear imperialistic, with major languages dominating the charts, a closer examination of European national-level data reveals a different story. Contrary to the global trend, local or national languages are increasingly surpassing global languages in their respective national markets, regardless of their popularity. This picture on the Spotify European National charts suggests a glocalization process, where global trends interact with and even strengthen local cultural expressions, creating what Baltzis (2005) terms a "transcultural" environment.

This glocalization process extends beyond Spotify's ecosystem and is mirrored in commercial music charts. While global languages maintain dominance in global commercial charts, the landscape of national commercial charts has shifted since the rise of music streaming,

particularly with Spotify's emergence in 2016 (Hesmondhalgh, 2021). The period from 2004 to 2016 witnessed a trend towards language homogenization in these charts, favoring global languages. However, from 2016 onwards, this trend reversed, with national languages experiencing a growing presence, underscoring Spotify's positive influence on national languages extending beyond the Spotify platform and impacting the broader music industry.

The positive impact of Spotify on national language music extends beyond increased chart presence. It also translates to a corresponding increase in the popularity of songs in those languages, as Spotify's top national charts are based on play counts. At the same time, this heightened popularity directly translates to increased revenue for national artists, fostering a thriving and sustainable local music scene.

The factors contributing to the increased consumption of national language music are complex and multifaceted. Cultural factors, such as a growing awareness of and preference for local content in the face of globalization, play a role. This is reflected in the interviews, where users often expressed a strong connection to their national music, aligning with Way et al.'s (2020) findings of a growing preference for local content despite increased exposure to global music. However, the abrupt shift in national language music consumption observed in 2016 suggests a significant influence from Spotify and potentially other streaming platforms. Identifying the precise mechanisms within Spotify responsible for this promotion is challenging due to the platform's lack of algorithmic disclosure. One possibility is that Spotify's democratization of the music industry entry barriers (Datta et al., 2017) has increased the visibility and accessibility of local music, leading to greater consumption. Another possibility is that Spotify's algorithm, responding to cultural preservation needs, actively promotes national language songs matching the user preference for home bias (Way et al., 2020).

Assessing the influence of the recommender system is complex. User perceptions of homogeneous recommendations and underrepresentation of national language music, combined with existing research on popularity bias in recommender systems, raise doubts about the algorithm's role in promoting local content. Conversely, the sudden surge in local music consumption is difficult to explain without algorithmic intervention, especially if the algorithm was exclusively driven by popularity bias. While a definitive conclusion on the recommender system's influence remains elusive, the data suggests that if any bias exists, it might be the "home bias" proposed by Way et al. (2020), favoring local content over purely popular content.

Interestingly, a disconnect exists between the objective data, which demonstrates a positive impact of Spotify on national language music consumption, and user perceptions, which tend to be more negative. Interviewees generally perceive their music consumption as homogenized by the platform, despite evidence to the contrary. However, when presented with data showcasing Spotify's positive impact on national language representation, their perceptions shift towards a more positive outlook, albeit with lingering skepticism about the impact at a local level.

This discrepancy can be understood through Kordzadeh & Ghasemaghaei's (2022) interplay framework of algorithmic bias. This framework suggests that individual characteristics (e.g., preference for local cultural products), task characteristics (e.g., preference for human-curated recommendations), and technology characteristics (e.g., lack of transparency and user control over Spotify's algorithm) can interact to create a perception of algorithmic bias. This perceived bias, in turn, negatively influences Spotify's perceived fairness, leading to reduced recommendation acceptance, algorithm appreciation, and system adoption. This creates a reinforcing cycle that may lead users to underestimate Spotify's positive impact on national language music consumption at the individual level, despite the contrary evidence presented in the chart data.

Disseminating the findings of this research could potentially bridge the gap between user perceptions and the objective data, altering user understanding and potentially mitigating their concerns about language homogenization. This disconnect between perception and reality also highlights a promising avenue for future research, exploring the reasons behind this discrepancy and the complex relationship between user experience, algorithmic recommendations, and national language music consumption. It is important to acknowledge that the qualitative aspect of this study while offering valuable insights into user perceptions, is exploratory in nature and does not possess the same level of objectivity and generalizability as the quantitative analysis. Its primary function is to provide a deeper understanding of user perspectives and lay the groundwork for future research in this area.

In conclusion, the emergence of Spotify has undeniably influenced the consumption of national language music in Europe, fostering a complex interplay between globalization and cultural preservation. While global languages like English and Spanish continue to dominate the global music landscape, Spotify's platform has facilitated a glocalization process, empowering national languages to thrive in their respective markets and contributing to a more diverse and inclusive musical ecosystem. This positive impact is evidenced by the

increased chart presence, popularity, and revenue for national language music since Spotify's rise. However, a disconnect persists between the objective data and user perceptions, highlighting the need for further research into user experiences, algorithmic recommendations, and the intricate relationship between Spotify and national language music.

7. Conclusions

Having presented the totality of this thesis, it is now time to draw conclusions regarding the overall findings, assess the limitations inherent in the research design, and propose avenues for future research that could build upon this foundation.

7.1. Thesis Conclusions

In conclusion, this thesis has illuminated the intricate relationship between Spotify, cultural globalization, and the consumption of national language music in Europe. The findings reveal a dynamic landscape where global and local forces intersect, shaping the musical preferences and habits of millions of users. Spotify's emergence in 2016 marked a turning point, reversing the declining trend of national language music consumption and starting an era of increased visibility and consumption for local music across both streaming and commercial charts. This suggests that the democratization of music production and distribution through streaming platforms has created a more favorable environment for national language music, challenging the traditional narrative of cultural homogenization in favor of a "transcultural" environment where global and local influences coexist and interact, aligning with Hassi & Storti's (2012) concept of cultural hybridization within the 3H scenario.

However, the qualitative analysis reveals a disconnect between the objective data and individual experiences. While the chart data demonstrates a positive impact of Spotify on national language music consumption, users often perceive their listening experiences as homogenized, favoring global music over local content. This discrepancy reflects the importance of considering both quantitative trends and user perceptions to fully understand the impact of streaming platforms on cultural dynamics. It also highlights the need for further research to explore the particular ways in which users engage with and perceive algorithmic recommendations, as well as the potential for platforms like Spotify to bridge the gap between global trends and local cultural expressions by incorporating user feedback, increasing transparency, and diversifying recommendations to align user perceptions with the actual positive impact on national language music consumption.

7.2. Limitations

While this research has followed a thorough methodology to produce robust results, it is important to acknowledge its inherent limitations. Firstly, the scope of the study is limited to Europe, and while the findings may offer insights into global trends, they do not fully cover the diverse realities of national language music consumption worldwide. This limitation arises from the availability and accessibility of data, as well as the researcher's familiarity with the European context. While efforts were made to include a wide range of European countries, the absence of Spotify and commercial chart data for certain nations inevitably limits the study's representativeness.

Secondly, the qualitative analysis, while insightful, is based on a limited sample of five interviewees. For this study, the exploratory nature of the qualitative analysis makes five interviews an acceptable number to paint a general picture of users' perspectives on Spotify's impact. However, to conduct a deeper assessment and obtain a robust view of the exact perceptions of users at the European level, a more extensive and diverse sample of interviewees would be required, representing the wide range of profiles that European Spotify users could have and allowing a complete understanding of the diverse experiences and opinions on the perceived impact of Spotify in the consumption of national language music.

7.3. Future research

Future research could address the limitations of this study and extend its findings in several directions. Expanding the scope beyond Europe to a global level would allow for a comprehensive analysis of Spotify's impact on national language music consumption worldwide, enabling comparisons between different regions and cultures. Additionally, the vast amount of chart and lyrics data collected in this study presents opportunities for in-depth analyses. Examining individual European countries, comparing their patterns, and identifying outliers and their underlying causes could reveal additional variations in the impact of Spotify. Further, studying the behavior of each European language individually at a European level, comparing their presence, and correlating it with popularity, could shed light on the dynamics of linguistic diversity in the digital age.

Another possibility for future research involves expanding the qualitative analysis by including more diverse user perspectives. Incorporating a wider range of opinions and experiences would provide a more robust understanding of the general perception of Spotify's

impact on national language music consumption, potentially revealing cultural nuances and variations across different demographics. This could be further enriched by expanding the geographical scope of the qualitative research to include users from other regions, providing a global perspective on the issue.

Finally, incorporating the perspectives of artists would provide invaluable insights into the impact of Spotify on their careers and creative choices, particularly in relation to national language music. It would be especially interesting to investigate how artists navigate the decision to produce music in their national language versus global languages like English and how they perceive the potential trade-offs between cultural authenticity and broader reach. Understanding the factors that influence these choices, such as audience demographics, genre conventions, and personal artistic goals, will contribute to a widening knowledge of the complex interplay between language, identity, and artistic expression in the digital age.

In conclusion, addressing the limitations of this study through the proposed future research avenues would provide a more complete understanding of how the increasingly prevalent algorithmic recommender technologies impact the consumption and production of music representing minor cultural expressions, ensuring the preservation of cultural diversity and fostering a more equitable musical landscape in the digital age.

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Appendices

Appendix 1: Radio chart methodologies

Country	Provider	Methodology
Austria	Media Control GfK	Asked for more information. No reply
Belgium	Ultratop	“Every week, the physical sales are collected from a selection of independent sellers, web shops, and chains. In addition, the numbers of the download and streaming platforms and airplay (Radiomonitor) are also processed daily. The calculation is closed every week on Wednesday evening.” (Ultratop, 2024)
Bulgaria	EURO200	Asked for more information. No reply
Czech Republic	IFPI	“The overview is compiled according to the ratings of individual radio stations and radio networks. Each cooperating entity regularly sends us the ranking of the songs that were played most in the monitored period. The overview always shows the number of rotations for each song - i.e. how many times the song was played in the monitored week. Individual songs receive the appropriate number of points for the final ranking, which is determined as a product of the number of rotations and the radio coefficient. This coefficient is based on the position of a specific radio station on the market (this is determined on the basis of the number of listeners. We receive quarterly reports on the radio market from the RADIOPROJEKT system (https://www.mms.cz/rozhlasovy-trh/rozhlasovy-trh-v-cr /), where the share of each radio in the total market is determined.The final weekly ranking is determined based on the total number of points of each song” (IFPI, 2024b)
Denmark	Nielsen Music Control	“The most streamed and downloaded tracks. Streams are converted to track units and added together with download sales.” (Wikipedia, 2024b)
Finland	IFPI	“Suomen Virallinen Lista is a weekly list of the best-selling recordings in Finland and the most listened-to content of streaming services.” (IFPI, 2024a)
France	SNEP	“The top Singles lists for each title ranked the streaming listens, download sales and physical sales, collected by the service provider from physical stores and audio streaming and download platforms.” (SNEP, 2024)
Germany	Top40Charts	Asked for more information. No reply
Global	Mediatraffic	“The global Track Chart based on a combination of streaming, sales and airplay. At the moment the ratio is 60% streaming, 20% sales and 20% airplay.” (Mediatraffic, 2024)

Greece	Top40Charts	Asked for more information. No reply
Hungary	Slagerlisták	“monitoring the broadcasts of national, regional (networked), local radio stations in county seats and other rural settlements 24 hours a day, 7 days a week, indicating the exact playing number of each song, as well as the exact arranged in a weighted manner with official radio audience data associated with the broadcast time.” (Slagerlistak, 2024)
Ireland	IRMA	“Ireland’s Top 50 biggest songs of the week, compiled by the Official Charts Company, based on sales of downloads, CDs, vinyl and audio streams.” (Official Charts, 2023)
Italy	Top 40 Charts	Asked for more information. No reply
Netherlands	Stichting Nederlandse	“The Top 40 is compiled by the Dutch Top 40 Foundation based on airplay, streaming and trends in social media.” (Top 40, 2024)
Norway	VG	“The data are collected by Nielsen Soundscan International and are based on the sales in approximately 100 shops in Norway.” (Wikipedia, 2022)
Poland	EURO 200	Asked for more information. No reply
Portugal	EURO 200	Asked for more informaiton. No reply
Slovakia	IFPI	“The overview is compiled according to the ratings of individual radio stations and radio networks. Each cooperating entity regularly sends us the ranking of the most played songs in the monitored period. The overview always shows the number of rotations for each song - i.e. how many times the song was played in the monitored week. Individual songs receive the appropriate number of points for the final ranking, which is determined as a product of the number of rotations and the radio coefficient. This coefficient is based on the position of a specific radio station on the market (this is determined on the basis of the number of listeners. We receive quarterly reports on the radio market from the RADIOPROJEKT system (https://www.mms.cz/rozhlasovy-trh/rozhlasovy-trh-v-cr /), where the share of each radio in the total market is determined.The final weekly ranking is determined based on the total number of points of each song” (IFPI, 2024b)
Spain	Promusicae	“Includes physical sales, in accordance with the data shipped by 90% of physical sales estimates without extrapolations, easy downloads from digital stores and units equivalent to streaming sales and viewings, according to information facilitated by the main audio and video streaming services.” (Promusicae, 2024)
Sweden	IFPI	“All statistics are based on consumer sales in Sweden and include physical, downloaded and streamed music sales. Sweden's top list is updated every Friday afternoon.” (IFPI, 2023)
Switzerland	Media Control GfK	“Since July 2014, usage data from major streaming providers (e.g. Deezer, Spotify or Apple Music) has been collected and integrated into the singles chart, and since the

		beginning of 2018, into the albums chart. From 2023, YouTube streams will also be included in the Music Charts. Since usage data from streams and downloads are not directly comparable, GfK Entertainment relies on the average equivalent of a stream to a download for integration. This average value is currently 161:1, i.e. there is one download for every 161 streams (subscription/premium streams only). For adfunded streams (advertising-funded), the average integration rate is 1185:1 (as of 01.01.2023). The mixing rates are checked and adjusted at least once a year." (IFPI, 2024c)
Ukraine	FDR	"Radio airplay chart by FDR Weekly chart archive since 2004" (Top40Charts, 2024)
United Kingdom	Official UK Singles Chart	"The Official UK Singles Chart reflects the UK's biggest songs of the week, based on audio and video streams, downloads, CDs and vinyl, compiled by the Official Charts Company." (Official Charts, 2024)

Appendix 2: Interview consent and guide

Interview introduction

This interview will be part of my Master's Thesis where I study language fairness in Spotify. The general aim of my study is to assess how Spotify has impacted the consumption of music in minority languages and to understand the user perception of this process, which is the goal of this interview.

Verbal consent

- To participate in this interview
- To record this interview so that I don't miss out on important comments

Interview details

The outcomes of this interview will be included in my Master Thesis project and its posterior dissemination. Regarding your personal information, your identity will be anonymized and only your demographic data (age group and nationality) will be used. The interview aims to know your perspective around the following questions in a natural conversational way. The duration of the interview is planned to be around 30'-45'. During the interview, feel free to ask any questions at any moment and comfortably express your opinion. The goal of this interview is only an exploration of your opinion, **there are no wrong answers**. Many thanks for your collaboration!

QUESTION 1: What platforms do you use to consume music?

- When did you start to use Spotify and why?
- Was the Spotify RecSys a differential factor in your choice?
- Is Spotify the only the only platform you use?
- Do you also listen to or have listened to music from non-streaming platforms (such as radio or live music)?

QUESTION 2: How is your consumption of music in your local language?

- Do you often consume music in your local language?
- How do you consume music in your language on Spotify?
- Do you actively choose the songs, get them as recommendations, or both?
- Are you comfortable when your song consumption is guided by an algorithm?
- Will you feel more comfortable if a human crafted the recommendations for you?

QUESTION 3: How fair do you think Spotify recommendations are to your local language?

- Do you think you receive a fair amount of local language song recommendations considering your listening habits?
- Do you think local language music is treated fairer on other channels such as the radio? Why?

- Do you think Spotify's recommendation algorithm could be biased toward global language music?
- Do you think this possible bias in your recommendations can be reflected in the song rankings/charts?

QUESTION 4: What is your perception of Spotify's language fairness after seeing the chart metrics?

- Has your perception of Spotify's language fairness changed after seeing the results? How?
- Will these metrics make you trust Spotify recommendations more, less, or the same?
- Do you think Spotify can achieve fairer recommendations? How?

Appendix 3: Interview transcripts

NORWEGIAN USER - INTERVIEW

Isaac Munoz: *Have you released music on Spotify?*

Norwegian user: Yeah. One song.

Isaac Munoz: *Feel free to talk about what you want as a user and artist. The first question is: what platforms do you use to consume music?*

Norwegian user: Spotify pretty much. And I guess TikTok and social media since those are platforms for music discovery too. But for streaming, it's only Spotify.

Isaac Munoz: *And when did you start using Spotify and why?*

Norwegian user: I think I started using Spotify when my parents did. As a kid I might have used iTunes, but in Norway everyone uses Spotify, so you want to do what everyone else is doing.

Isaac Munoz: *So it was only a social factor what made you choose?*

Norwegian user: I think so. I started with a family account when I was a kid, and kept it because of culture, like it's like iPhones. I also like the features, though.

Isaac Munoz: *Do you also listen to radio stations, or only use Spotify?*

Norwegian user: I listen to podcasts, but not radio. Maybe in the summer at the family cabin, there's a radio on in the background, but rarely. I used to do it more as a kid.

Isaac Munoz: *And what about live music?*

Norwegian user: Yeah, I go to a summer festival every now and then.

Isaac Munoz: *Do your live music choices influence what you listen to on Spotify?*

Norwegian user: Definitely.

Isaac Munoz: *How is your consumption of music in Norwegian?*

Norwegian user: A lot of my friends listen to Norwegian music, and I do too. But recently, I've been very much into American music. Not just hip hop, but alternative hip hop and pop, similar to what I make. But I'm trying to consume more Norwegian rap, which is very big here.

Isaac Munoz: *How do you consume Norwegian rap on Spotify? Do you actively choose it or get it recommended?*

Norwegian user: I search for the Norwegian artists that come up on my For Your Page in TikTok. But I rarely got them recommended. Maybe because I listen to so much non-Norwegian music.

Isaac Munoz: *Are you comfortable when your music consumption is guided by an algorithm?*

Norwegian user: I think so. But a lot of the time Spotify recommends stuff I've already listened to. I listen to a lot of different genres, and if I make a playlist for a specific genre, it recommends what I've already listened to, not new stuff.

Isaac Munoz: *So you'd say Spotify is making you listen to certain music and not recommending things outside that bubble?*

Norwegian user: Yeah, especially smaller artists. The algorithm is made from what people listen to most, and what I've listened to most. So it makes sense that I don't get fresh stuff.

Isaac Munoz: *Yeah, but new stuff is necessary. Popular music is made to be liked by everyone, but you can discover new stuff, and smaller artists can get promoted. As an artist, what's your take?*

Norwegian user: I understand why the algorithm is the way it is. Most people want to listen to whatever is nice and easy. But I want to explore new music. I also really like the idea of smaller artists being able to reach listeners. It's really difficult, especially today when you have to know how to use TikTok or social media.

Isaac Munoz: *Would you feel more comfortable if recommendations were guided by a human who knows you?*

Norwegian user: Yeah, I think so. Like a mixture of my dad, older brother, and friends with similar tastes. They know my taste and to what extent I want to explore.

Isaac Munoz: *Do you think algorithms can reach this level of perfection?*

Norwegian user: Maybe not the same, because they can't pick up on other inputs, like what podcasts I listen to or where I'm going. But it would be good if there was a questionnaire so the algorithm could take into account your personality and goals when listening to music.

Isaac Munoz: *Do you think language and cultural background are important in recommendations?*

Norwegian user: It depends. In a lot of countries, people find their nationality a bigger part of their identity. But Norwegians learn English well in school, and even though we're proud of being Norwegian, I personally enjoy American music. So it depends on your preferences and culture.

Isaac Munoz: *How fair do you think Spotify recommendations are to Norwegian? Do you listen to more Norwegian music than you're recommended?*

Norwegian user: I think I definitely listen to more than I'm recommended. It's been a while since I've explored new music on Spotify, but I haven't noticed getting a lot of Norwegian music recommended, even on my Norwegian playlist.

Isaac Munoz: *Maybe Norwegian music is treated more fairly on other channels, like radio?*

Norwegian user: Yeah, in Norway, yes. We're proud of our Norwegian musicians, even though many create English music.

Isaac Munoz: *So you think Spotify's algorithm could be biased towards global music?*

Norwegian user: Yes, but I'm not sure if you can call it bias. The whole music industry is bombarded with new stuff all the time, and most of that is in English. So it's a step to reach through that wave. And the algorithm recommends the stuff that most people listen to, so it's hard for smaller artists to get up there. That's why you have platforms like Tidal and Deezer, trying to work with a different model where smaller artists get paid more fairly.

Isaac Munoz: *As an artist, do you feel any pressure to write in English because of this wave?*

Norwegian user: I started writing in English because that's what I heard most, but I've tried Norwegian and really enjoyed it. If I ignored money, I think I'd write more in Norwegian, but English opens more doors on a global market.

Isaac Munoz: *You commented on this wave of English music, and how it influences you as a user and artist. Do you think this is reflected in the song charts?*

Norwegian user: Definitely. I think mostly English music.

Isaac Munoz: *Actually, I've found that in Norway and other European countries, there's been more presence of local language music in the top charts. For example, in Norway, it increased from about 25% to 80% in the last few years. What's your perception about this? Does this change your opinion of Spotify's algorithm?*

Norwegian user: It's interesting. I don't get recommended enough Norwegian music, but I don't know if I should just because I'm Norwegian. It's interesting to see that this is happening in the top charts. It's difficult to say. Maybe it's just what I'm used to, so I still feel like it's that way. And even though my friends and I might listen to a lot of Norwegian music, everything on social media is usually in English. So we might feel like the whole world is in English, even though it's not.

Isaac Munoz: *Now that you know these metrics, would you trust Spotify recommendations more, less, or the same?*

Norwegian user: Maybe more, especially with Norwegian music. But I still feel like I need to experience the change myself to feel it. Even though I might have technically experienced this change, my perception is different from reality.

Isaac Munoz: *One last question: how do you think Spotify can achieve more fair recommendations?*

Norwegian user: It would be nice to have a "Norwegian mix," strictly Norwegian music that I listen to. I don't know if they could create a specific Norwegian music playlist, though, since genres are so fluid. Not only just Norwegian music but specific genres of Norwegian music, like the new upcoming rappers.

GERMAN USER - INTERVIEW

Isaac Munoz: *Which platforms do you use to listen to music?*

German user: I use Spotify, of course, mostly because everyone else uses it and there are nice network effects of sharing and everything. But also I will sometimes use YouTube. There are some YouTube channels and videos I regularly watch on music.

Isaac Munoz: *And do you listen to radio stations or live music?*

German user: I do listen to radio stations sometimes. I have like, they have music, but that's not the reason I listen to them. Mostly I listen to one particular radio now and then to listen to audio documentaries and reportages.

Isaac Munoz: *How do you consume Spotify?*

German user: Spotify radio function is something I use regularly and which I enjoy. I select one song or one of my playlists and just open the radio so it should suggest songs in a similar mood. I'm definitely a user of the algorithm there, I sometimes click on stuff on the Spotify home page where kind

of it suggests different things, which I assume is also part of the algorithm. I also sometimes use this weekly playlist they make for people to get to know new music. For YouTube, it's not the case. I have one particular channel which is called Lofi Girl for studying and either I listen to their live streams or I listen to some of their videos where they have one hour of music.

Isaac Munoz: *Do you think that maybe the recommendations that you can get in Spotify, are a differential factor to choose Spotify or it's because of the network effects?*

German user: I would say neither. For me, the biggest selling point of Spotify is it's one place where you have access to everything. I just like having one single location where I can listen to everything I care about. The other two things you mention are nice to have on top. I wouldn't buy Spotify only for the algorithm, and I wouldn't buy it only for the network effect.

Isaac Munoz: *How do you consume music on Spotify?*

German user: I do use a lot of recommendations for exploring music. My process in Spotify is: I either listen to songs I already know and I have in my playlist or my collections. Or, if I'm in the mood, I try to listen to something new. And then most times I will use the algorithmic functions of Spotify. Other times, I would go to a song or an artist I like, and I know maybe 2-3 songs and then I'd go on the artist page and just play a whole different album of them. I do this more and more now to kind of detach myself from the algorithm. But I think the majority is still algorithmic.

Isaac Munoz: *Do you feel comfortable with the algorithmic suggestions?*

German user: I never had a moment where I thought: this suggestion is very bad, now I want to stop. For me, I'm not comfortable with the thought of an algorithm that I don't know and don't understand is shaping my musical exploration. I want to keep my own element of curiosity and exploration in there without being fully guided by some software.

Isaac Munoz: *Would you feel more comfortable if recommendations were guided by a human who knows you?*

German user: Definitely. I feel that a person in a record store, for example, can consume music from a more human perspective, factoring in things an algorithm wouldn't, like the band's personality and what they do besides music. They would also observe me more than an algorithm. Spotify can see all the songs I play, but a person in the shop sees my reactions and we can have a dialogue. I really like human interaction; it feels authentic and transparent, unlike algorithmic interaction, which feels vague and intransparent.

Isaac Munoz: *Do you think that algorithmic recommendations can ever achieve the level of detail as human recommendations?*

German user: If they become an AI assistant that I can interact with on a human level, maybe. I can see it reaching that level, but I'm not sure I'd be comfortable with it.

Isaac Munoz: *Do you think our perception of recommendations is influenced by whether it's coming from an algorithm or a human?*

German user: For sure. Humans are trained to interact with each other, so we're more comfortable with the feeling of interacting with another person.

Isaac Munoz: *How often do you get German music recommendations on Spotify?*

German user: I don't listen to too much German music. I listen to some artists occasionally. Spotify seems to mirror my listening habits in its recommendations. If I listen mostly to lo-fi music for a week, that's what I get recommended.

Isaac Munoz: *So you rarely get German music recommendations because you rarely listen to German music?*

German user: Exactly.

Isaac Munoz: *What about the Discover Weekly playlist? Do you get more general recommendations there?*

German user: Mostly it's still the lo-fi bubble. Sometimes there are German songs. There was a phase where I got a lot of Dutch songs, which was weird because I never listened to them.

Isaac Munoz: *And now, speaking more generally, what's your perspective on how German music is treated on Spotify compared to other channels like radio stations or music magazines?*

German user: The radio station I listen to plays very diverse music. I often save songs because they're so cool and different. It feels like one of their goals is to reflect a diverse view of music. Comparing that to Spotify, Spotify feels much more mainstream and less diverse. I rarely listen to the charts or popular songs. The few times I have, I felt it wasn't very diverse. It's also not my kind of music. It feels like it's either pop or rap. I don't get the feeling of diversity I get from the radio, where there are different languages, flavors, and colors. It's super interesting. With the radio, I feel like I'm traveling mentally to the whole world and listening to local music. With Spotify charts or recommendations, it feels like they're just showing me what might keep me listening longer.

Isaac Munoz: *If we compare a mainstream radio station to Spotify, do you think you'd see more German music on the radio?*

German user: I can't really say, because I never look at the German Spotify charts. But I'd expect German radios to play more German songs than Spotify. From my experience, Spotify seems to draw you more towards global artists than local ones. I feel like German radio stations have a stronger sense of promoting local artists, maybe even a quota.

Isaac Munoz: *So you'd say Spotify's algorithm might be biased toward global music?*

German user: I would. I think there's a popularity bias. I'm not an expert, but I assume Spotify wants to make a profit and to do that, they give people what they like, which is often what's already popular. I imagine this favors global superstars over local artists.

Isaac Munoz: *I have data from the Spotify German charts over the years. Let me know your thoughts. As you can see, at the beginning of 2017, there was almost no presence of German songs. But by 2019, there was a huge increase, and it's mostly maintained that level since, though maybe slightly declining. It's interesting that every Christmas, the presence of German songs decreases due to English carols. Is this what you'd expect?*

German user: I would've expected fewer German songs on average. For me, it looks like it's roughly around 50% or a bit above. I'm a bit surprised it's more common than I would have expected, since in my social circle, German music isn't always appreciated.

Isaac Munoz: *Does this chart change your perception of the Spotify algorithm's fairness?*

German user: I feel Spotify is a bit more fair than I expected. 50-60% of German songs in the charts is higher than I thought. So the graph changed my opinion; it's better than I thought. I was influenced by the concept of the 1% economy and the long tail, where there are few winners and many losers. It makes sense that a global platform leads to few big winners and many who don't get attention. But I'm still hesitant to accept this one graph as counter-evidence. To truly assess this, you'd have to look at more local levels, not just Germany as a whole. It's a complex topic. There are listeners loyal to

specific artists, while others, like me, are guided by recommendations. It could be that Spotify's recommendations create more bubbles.

Isaac Munoz: *Would you now trust Spotify recommendations more?*

German user: I don't think it'll affect me too much. The current German charts have a lot of German songs, but they're mostly genres I wouldn't listen to, like German rap. So this doesn't increase my trust that my personal recommendations will be more German.

Isaac Munoz: *Do you think Spotify can achieve fairer recommendations regarding language? If so, how?*

German user: I think it can and should have a fairer selection of local music. Globalization leads to a reduction of culture, and we need to question if we want that. Spotify should support local music to preserve cultural diversity. A future where everyone listens to the main English charts doesn't seem interesting to me.

GREEK USER - INTERVIEW

Isaac Munoz: *Which platforms do you use to consume music?*

Alexandros: I mainly use Spotify, but also YouTube for music videos and songs that aren't on Spotify. I'm mostly exposed to music through Spotify, and I listen to mostly Greek music, maybe 65% or more.

Isaac Munoz: *How long have you been using Spotify?*

Alexandros: Since the first COVID lockdown period. Before that, I used YouTube or downloaded music.

Isaac Munoz: *What made you choose Spotify over other platforms?*

Alexandros: Initially, it was because it didn't have ads and used less data than YouTube. Now, it's because of the accessibility to a large database of music and podcasts. It's also helped me discover new artists and music.

Isaac Munoz: *Did the recommendation system performance influence your choice?*

Alexandros: Honestly speaking, when I first subscribed to Spotify, I wasn't even aware of this kind of technology. So initially it wasn't a factor. But now, while it's not the main reason I have Spotify, it is a reason to explore new music, especially if you're bored of the same music and want to discover similar artists or genres.

Isaac Munoz: *Do you also listen to music on other channels, like radio stations or live music?*

Alexandros: I go to a few concerts per year. I mostly listen to radio on demand, either on Spotify or YouTube, and only listen to traditional radio when driving in Greece.

Isaac Munoz: *How is your consumption of music in Greek? Do you listen to it often?*

Alexandros: Yes, it's actually 80% or more of the music I listen to, including both songs with lyrics and instrumental music by Greek artists. For example, I listen to an artist who makes electro music with Greek lyrics, but 50% of their songs are instrumental. Greek isn't as widely spoken as English or

Spanish, so it's difficult for Greek artists to establish themselves in the global music industry. That's why we don't have many big Greek artists who've conquered the world.

Isaac Munoz: *Do you consume Greek music because you search for it, or do you get recommendations?*

Alexandros: Mostly I search, because voice commands often result in the wrong song. Many Greek artists have English names, or songs get miscategorized.

Isaac Munoz: *Then, do you get recommendations in Greek?*

Alexandros: Yes, but sometimes they can be a bit random. I might listen to Greek pop or rap and get recommendations for trap or international indie, even though I'm looking for Greek indie music.

Isaac Munoz: *Would you say you feel more comfortable when your consumption is guided by an algorithm or a human?*

Alexandros: I don't have experience with a person curating music for me, but it would be interesting. I mostly create my own playlists because I don't trust the algorithm to understand my preferences.

Isaac Munoz: *Why?*

Alexandros: Because I know what I like. For example, I listen to Greek rap, and the algorithm might not understand the nuances of the topics discussed in those songs. If a song talks about social issues, I might not want to listen to songs about money and material possessions.

Isaac Munoz: *Do you think Spotify recommendations are fair to Greek music?*

Alexandros: I get Greek recommendations, but I'm not sure if they're based on my actual listening habits or just clicks. It seems like it often recommends the most popular songs in the same genre, not necessarily the ones I'd like.

Isaac Munoz: *Do you think Greek radio stations are fairer to Greek music than Spotify?*

Alexandros: It's hard to compare them. Spotify is mostly used by younger generations, while radio stations reach a wider audience. Also, radio stations have regulations and committees that control what's played, while Spotify doesn't.

Isaac Munoz: *Do you think that Spotify's recommendation algorithm might be biased toward global music, like English music?*

Alexandros: I don't know if it's biased or not. It's difficult to say. I feel like Greek artists aren't promoted as much as they should be, but I don't think Greek music is neglected by Spotify.

Isaac Munoz: *You mentioned Greek artists who could be international but aren't. Do you think the algorithm is at fault?*

Alexandros: Maybe. Music is cultural. In the Balkans, Greece, Turkey, Egypt, Israel, and other parts of the Eastern Mediterranean, we have similar music cultures. But it feels like artists from these countries are underrepresented, maybe because platforms like Spotify don't have the recommendation systems to promote them effectively.

Isaac Munoz: *Now, let's look at the data I've collected on the Greek charts over the years. It shows the percentage of Greek songs in Spotify's Top 20 Greek chart. In the beginning, there was little to no Greek music, but it increased significantly around 2019. Now, most of the songs on the chart are Greek. Is this what you expected?*

Alexandros: The low numbers at the beginning make sense because Spotify wasn't popular in Greece until later. The increase reflects that Greek people listen to a lot of Greek music. It makes sense, and there are a few reasons for this. First, we have unique music styles like Rembetiko, which is a traditional Greek genre with bouzouki, that people still listen to. Second, many people in Greece don't know English well, so they can't relate to English music as easily.

Isaac Munoz: *So after seeing this data, do you think you would trust Spotify recommendations more?*

Alexandros: I think Spotify is promoting Greek songs, at least in Greece. Maybe they're not promoting international music enough, but that might be because the Greeks don't listen to it as much.

Isaac Munoz: *Do you think the Spotify algorithm does a better job promoting popular English music to local audiences than promoting local music globally?*

Alexandros: Yes, I think it's better at that but I haven't personally seen it. I like different genres of music, and it would be great if Spotify could recommend music from other countries based on my taste, not just language.

Isaac Munoz: *So you don't get recommendations for new things outside your usual preferences?*

Alexandros: Yes, it would be cool if Spotify had a button to explore music in the same genre but from other countries. That would be a good way to test if the algorithm is unbiased.

Isaac Munoz: *What about features like explanations for recommendations? Would that help you trust the algorithm more?*

Alexandros: Yes, definitely. I would give them my consent to recommend more diverse music if I could understand why they're recommending it.

Isaac Munoz: *Do you think Spotify should do more to promote artists from other countries?*

Alexandros: Yes, music is international. While people might prefer their own language, there are unique genres you can't find easily, like Greek bolero or Spanish Arabic music. It would be nice if Spotify could recommend music from other regions with a similar vibe, even in different languages.

Isaac Munoz: *So you'd like more ways to influence the algorithm, like a filter to explore music in the same genre but from different regions?*

Alexandros: Yes, that would be a great feature. If the algorithm still only recommends music from the US or English-speaking countries, then it's biased. It's a good feature that would allow users to explore music and also test the algorithm's open-mindedness and lack of bias.

HUNGARIAN USER - INTERVIEW

Isaac Munoz: *What platforms do you use to consume music?*

Hungarian user: I mainly use Spotify. I used to use YouTube but not much anymore, except occasionally to download soundtracks for video editing. For listening to music or podcasts, it's Spotify, as I have a family subscription.

Isaac Munoz: *Do you use any other platforms that aren't internet-based? For example, radio or live music?*

Hungarian user: I sometimes listen to the radio at my mom's house, as it's her habit, but not usually on my own. I do go to concerts, mostly electronic music, but also classical music.

Isaac Munoz: *When did you start using Spotify and why?*

Hungarian user: I started using Spotify around 2021 because my family got a subscription and added me. Before that, I downloaded music directly to my phone.

Isaac Munoz: *Did the recommendation system influence your choice to use Spotify?*

Hungarian user: No, it was more about the convenience of having everything organized in one app without needing to do it manually.

Isaac Munoz: *How is your consumption of music in Hungarian? Do you often consume it?*

Hungarian user: Yes, I would say so. It varies though, as I go through phases of listening to different genres like electronic, pop, or indie music. Sometimes I listen to a lot of Hungarian rap or alternative music. I'm quite involved in the Hungarian music industry, as my friends are musicians and my cousin is a producer, so I keep up with the trends.

Isaac Munoz: *Do you consume more Hungarian music on Spotify, radio, or at live events?*

Hungarian user: Definitely on Spotify. I rarely go to concerts with vocals in Hungary, mostly classical or festivals. Spotify is the most convenient way for me to access a wide variety of Hungarian music.

Isaac Munoz: *When you listen to Hungarian music on Spotify, do you search for it or use recommendations?*

Hungarian user: I usually search for specific songs or artists.

Isaac Munoz: *When you do use Spotify's recommendations, do you feel comfortable being guided by an algorithm?*

Hungarian user: I use the recommendation feature, such as Release Radar, to discover new music when I'm bored of my usual choices. However, sometimes it's frustrating when it doesn't include songs I know are new and want to hear.

Isaac Munoz: *Would you feel more comfortable if recommendations were from a person who knows you as well as the algorithm?*

Hungarian user: I'm actually more comfortable with the algorithm. It doesn't get offended if I don't like its suggestions. A person who knows me that well would be a close friend, and I wouldn't want to hurt their feelings by rejecting their recommendations.

Isaac Munoz: *Going back to Hungarian music, do you get more recommendations of it than you listen to, proportionally the same, or less?*

Hungarian user: I don't think I get many Hungarian recommendations, maybe almost none in the Release Radar. I know Spotify has Hungarian playlists, but I haven't seen many recommendations in other places.

Isaac Munoz: *Do you think there should be more, considering how much Hungarian music you listen to?*

Hungarian user: Yes, there should be. I listen to a lot of Hungarian music and follow Hungarian artists. It might be because I haven't listened to much recently, but there should still be some in the Release Radar.

Isaac Munoz: *Why do you think there isn't more Hungarian music recommended?*

Hungarian user: It could be due to the "long tail theory," where popular songs get amplified and smaller artists struggle to gain listeners. My friends in the music industry have said it's difficult to get into playlists, but if they do, their songs become significantly more popular.

Isaac Munoz: *Do you think that Hungarian music is treated more fairly on other platforms, like radio stations?*

Hungarian user: In my experience, Hungarian radio stations do play a lot of Hungarian music, especially mainstream music. However, there's also a political aspect to consider. Artists and bands who criticize the government are often censored and not given opportunities to perform or have their music played. This censorship is quite visible, with concerts being canceled and songs being removed from playlists. I can send you an article about this if you'd like to include it in your analysis. I think radio stations try to appeal to a broad audience by balancing mainstream Hungarian songs with popular global songs. YouTube is still an important platform for the music industry in Hungary, so artists need to cater to that audience as well.

Isaac Munoz: *I have some data collected from Spotify's Hungarian Top 20 chart over the years, showing the percentage of Hungarian songs. In the beginning, there were barely any, but now it's increased significantly. Is this surprising to you?*

Hungarian user: Yes, it's very surprising. I don't see this reflected in my own consumption of music on Spotify. It could be because my listening habits are inconsistent, sometimes focusing heavily on Hungarian music and other times not at all. But I didn't expect the top 20 to have so many Hungarian songs, especially considering that Hungarians also listen to a lot of international music.

Isaac Munoz: *Has your perception of the algorithm's fairness changed after seeing this data?*

Hungarian user: I'm not sure how much this reflects the fairness of the recommendation system itself. It's great to see so much Hungarian music on the charts, but I still don't feel exposed to much new Hungarian music in my own recommendations.

Isaac Munoz: *So you don't think the chart necessarily reflects what people are recommended?*

Hungarian user: Right, it might just show what's popular overall. My perception has changed because it's better than I expected, but I still don't get a lot of new Hungarian music recommendations.

Isaac Munoz: *Now that you've seen this data, would you trust Spotify's recommendations more, less, or the same?*

Hungarian user: I'll trust them more, but I'll also pay closer attention to see if it reflects this trend in my own recommendations. I want to understand if I'm getting more Hungarian music suggested now.

Isaac Munoz: *Do you think Spotify can achieve even fairer recommendations? If so, how?*

Hungarian user: It's difficult to say, but I think it's already pretty fair to users. It could be fairer to artists by giving all their tracks a chance in playlists, especially for new artists who struggle to get started. The algorithm should try to promote emerging artists alongside the popular ones.

SWEDISH USER - INTERVIEW

Isaac Munoz: *How do you consume music, and what platforms do you use?*

Swedish user: I almost exclusively use Spotify for my music streaming needs. My family has had access to Spotify since its beta version due to my parents' connection with the founder. This long-standing relationship with the platform has made it incredibly convenient for me, especially since it's always been free for our family. The familiarity and cost-effectiveness of Spotify have solidified it as my primary music platform.

Isaac Munoz: *Do you think Spotify is better than other platforms because of its algorithm?*

Swedish user: Yes, I do believe Spotify's algorithm surpasses those of other platforms I've tried. While I've experimented with Deezer, another platform I had access to because of my dad's work, I found that their algorithm didn't quite align with my musical preferences. The recommendations felt less personalized and often didn't resonate with me. In contrast, Spotify's algorithm consistently curates playlists that introduce me to new music within my preferred genres and artists.

Isaac Munoz: *Do you use any other platforms besides Spotify?*

Swedish user: Although Spotify is my go-to platform, I occasionally listen to the radio. I find it a relaxing way to discover new music passively, without actively searching for specific songs or artists. Additionally, social media platforms like Instagram have become a significant source of music discovery for me, as songs often gain popularity and go viral through trends and challenges.

Isaac Munoz: *How often do you listen to Swedish music?*

Swedish user: I make a conscious effort to listen to Swedish music regularly. It's important to me to connect with my cultural roots through music. However, I've noticed that Swedish music can be harder to find on Spotify compared to internationally popular genres like English or Latin music. To ensure I'm getting my fill of Swedish tunes, I often turn to radio stations that prioritize local artists, particularly stations like Mix MEGAPOL, which dedicates its entire summer programming to Swedish music.

Isaac Munoz: *Do you usually search for Swedish music, or does Spotify recommend it to you?*

Swedish user: Most of the time, I actively search for specific Swedish songs or artists that I already know and enjoy. However, I have noticed that Spotify's algorithm does occasionally suggest new releases from Swedish artists that align with my listening history, which is a welcome surprise.

Isaac Munoz: *Are you comfortable with Spotify's algorithm recommendations?*

Swedish user: Not entirely. While the algorithm occasionally recommends songs I like, I find that it often suggests music that feels impersonal and doesn't resonate with my deeper musical interests. I prefer music that I can connect with on a personal level and share with friends and family. I often find that the algorithm's recommendations lack this communal aspect.

Isaac Munoz: *Would you be more likely to use algorithm recommendations if they were curated by a human?*

Swedish user: Absolutely. I believe that human curation would significantly improve the quality and relevance of the recommendations. A human curator could take into account my specific tastes, moods, and the context in which I'm listening to music. This emotional connection is something that an algorithm, no matter how sophisticated, cannot replicate.

Isaac Munoz: *I have some data on the amount of Swedish music in Spotify's Top 20 chart over the years. It shows an increase in Swedish music. Does this surprise you?*

Swedish user: Yes, the extent of the increase is quite surprising. I expected to see some Swedish music on the charts, as there has been a growing effort to promote local artists, but the significant jump in representation is unexpected.

Isaac Munoz: *Why do you think there's more Swedish music in the charts now?*

Swedish user: I believe there are a few potential contributing factors. One major factor is the radio stations' active promotion of Swedish music, particularly through initiatives like Mix MEGAPOL's "Swedish Summer," which exclusively features Swedish artists during the summer months. Another possibility is the heightened sense of national identity and nostalgia that emerged during events like the COVID-19 pandemic. This collective experience might have driven listeners to seek out and connect with local music more than before.

Isaac Munoz: *Do you think Spotify's algorithm is biased towards more popular languages like English?*

Swedish user: I've often asked this question myself. It's undeniable that my Spotify experience is heavily skewed towards American music. I believe that this bias is not just limited to Swedish music but extends to other non-English languages as well. I feel that Spotify's algorithm tends to favor globally popular music, often at the expense of local and niche genres.

Isaac Munoz: *After seeing this data, would you trust Spotify's algorithm recommendations more?*

Swedish user: The data showing the increased presence of Swedish music in the charts is certainly encouraging. It suggests that Spotify's algorithm might be evolving to better promote to local tastes and preferences. While I remain somewhat skeptical, this data does make me more inclined to give the algorithm's recommendations another chance.

Isaac Munoz: *If you were to improve the fairness of Spotify's algorithm and promote more Swedish music, how would you do it?*

Swedish user: I would strategically focus on promotions during the summertime, as this is a period when Swedes are particularly receptive to their cultural heritage and traditions. Crafting personalized playlists with a mix of classic and contemporary Swedish music could evoke nostalgia and resonate with listeners on a deeper level. Additionally, highlighting the diversity and richness of Swedish music through curated playlists and campaigns could spark broader interest.

Appendix 4: Datasets

All the datasets and Python scripts used for the retrieval, analysis, and visualization of the data of this research can be found in my Kaggle profile: https://www.kaggle.com/imbusto