

A cross-cultural study of criteria in the music playlist generation

Thesis project



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	2
Abstract	4
1. Introduction	5
2. Literature review	7
2.1 Identifying user's perspective	7
2.1.1 Evaluating music recommender systems	8
2.1.2 Analyzing hand-crafted music playlists	8
2.1.3 Analysing users' opinions through interviews	9
2.2 Cultural background as an influence to music	10
3. Problem Statement	12
4. Research Approach	13
4.1 Research Questions	13
4.2 Research Method	14
4.2.1 Survey Design	14
4.2.2 Data Collection	17
5. Data analysis	18
5.1 Demographics	18
5.2 Online music platforms	19
5.3 Music listening behaviour	20
5.4 Music playlist listening behaviour	20
5.5 Creating music playlist behaviour	21
5.6 Characteristics of self-created music playlists	24
5.7 Organizing music playlist behaviour	28
5.8 Participants in different residence countries	30
6. Discussion	32
7. Limitations	35
8. Conclusion and future work	37
8.1 Summary outlook	37
8.2 Suggested solutions and features	38
8.3 Future work	38
References	40
Appendix	46
Survey	46

Abstract

In the previous ten years, music streaming platforms have grown in popularity and generated significant revenue for the music business. They offer a variety of functions, one of which is the ability to create music playlists. The purpose of this study was to look into how consumers behave during this process as well as when listening to music. Aside from that, the study looked into listeners' cultural backgrounds and how they influenced the aforementioned aspects. People's birth country was linked to their cultural background in this study. The goal of distributing a questionnaire-based survey was to collect replies from consumers from various nations. Following the collecting of nearly 350 responses, 276 responses from Greece and the Netherlands were analyzed. There appeared to be differences in the preferred music styles and the use of music services. However, during the creation of a music playlist, the behaviour was nearly the same. The mood of the listeners, as well as the music genre and artist of the songs, were the most important variables in generating a list that would provoke a shared sentiment when played. Furthermore, rather than relying on the recommendation algorithms, many of the participants choose to create their own music playlists and pick songs one by one for their hand-crafted playlists. Proposed ideas for future recommender system designs discuss this non-preference. In addition, suggested features for music platforms based on the study's findings are presented.

1. Introduction

At the beginning of the 90's, one of the oldest musical instruments was found in Slovenia (D'Errico, Villa, Liona & Idarraga, 1998) and it is thought to be at least 40,000-55,000 years old. That discovery shows that music, in a different kind of today's form, has existed since the Paleolithic Age. In that period, music was mainly sounds that were helping humans either communicate or during the process of hunting. Since then, music has changed dramatically (Both, 2009). Sounds are not used in hunting anymore, but in entertainment, education, emotional expression, physical exercise, communication, health and in many more domains.

In addition to the use of music that has been spread to multiple fields over the years, the way music is presented has also gone through many stages. In the beginning of the 20th century, more people, regardless of their economic status, started having access to a variety of music through gramophones, a later version of phonographs invented by Thomas Edison, and radio broadcasting (CHARM, 2009). In that way, listeners were able to discover new songs and artists from the comfort of their home. With the invention of sound recording, vinyl records along with compact cassettes and compact discs (CD) became the new generation of storing and listening to multiple songs with low cost (CDROM2GO, 2018). Undoubtedly, however, the most crucial point in the history of music transmission comes with the widespread use of the Internet. Songs in MP3 format are available to anyone with just limited access to the World Wide Web (McCandless, 1999). Nevertheless, with the addition of the Internet in every possible device, music transmission changed one more time. Now, we are in the streaming era of music in which online streaming services, such as Pandora and Spotify, provide huge amounts of songs to everyone either for free or with a very small fixed monthly payment (Arditi, 2018).

According to *Statista.com*, online streaming platforms were the main source for listening to music between 2017 and 2021 (Statista, 2021). More specifically, in 2019 almost \$7 billion came from paid subscriptions in these services in the USA (RIAA, 2019). By using one of these services, users are capable of making extensive use of multiple functionalities available. Examples of these features are: ease of discovering new music, music categorizations, recommendations based on their preferences or past choices, sharing and saving options, playlists generation etc. Regarding the last feature, listeners are able to either listen to an existing music playlist or create their own from scratch. A survey that was conducted from *Nielsen* shows that almost 6 out of 10 users of the platforms prefer the second option (Nielsen, 2017). However, the criteria that are taken into account in this playlist creation, have not yet been fully investigated by the scientific community.

Most of the studies investigating criteria for playlist generation mainly analyze existing music lists to discover what users think during the creation process (Slaney &

White, 2006; Pichl, Zangerle & Specht, 2016). The artist, lyrics, tempo, and popularity of the songs, as well as the mood of the user who builds the tracks list, appear to have a significant effect in the creation of the playlist (Kamalzadeh, Baur & Möller, 2012; Jannach, Kamehkhosh & Bonnin, 2014). The findings from these studies are based on ex-post analysis of already-made music playlists. Very few researchers have conducted interviews or surveys with the listeners to discover their thoughts (Cunningham, Bainbridge & Falconer, 2006; Stumpf & Muscroft, 2011; Kamehkhosh, Jannach & Bonnin, 2018; Kamehkhosh, Bonnin & Jannach, 2020). In most cases, the interviews could only consider a relatively small sample, so a large-scale investigation is a research gap.

As a result, the purpose of this thesis is to identify the most crucial parts of creating a music playlist, from the user's perspective. To achieve this, a questionnaire-based survey will be conducted. The criteria will be examined from a cultural perspective also, by taking into account the birth and the residence country of the listener. This comparison between the different countries can be insightful because the percentage of Internet users in each nation, and as a result the number of music streaming platforms' users, is different. For example, in 2019, 76% of Greek people used the Internet while this percentage in The Netherlands rose to 93% (The World Bank Open Data, 2020a).

Finally, the findings will be explored in relation to the development of recommender systems as well as prospective features that could be implemented inside music streaming services. In addition, future work ideas will be provided in terms of listener behaviour in combination with their cultural background.

The rest of the thesis will examine related work ([Section 2](#)), as well as the defining of the problem and the identification of the gap in science ([Section 3](#)). Following that, the research questions and methodology will be presented ([Section 4](#)). [Section 5](#) will offer the descriptive analysis as well as statistical tests. In [Section 6](#), we discuss the key findings associating them with previous studies as well as with possible explanations. The limitations that occurred will also be discussed ([Section 7](#)). Finally, there are conclusions and suggestions for future projects ([Section 8](#)).

2. Literature review

Since the emergence of CDs and MP3s, music playlists have been investigated from multiple perspectives. During the decade of 2000, when these types of music storage and format were being used across the world, users' behaviour in the creation process of music lists had been explored. Even after the arrival of the streaming era and especially after 2012, studies kept on focusing on that area in order to find the suited algorithms for automated music playlists generation. According to Bonnin and Jannach (2014) there are 7 different categories in which music playlist generation algorithms can be classified: 1) Similarity-based Algorithms (Pohle, Pampalk & Widmer, 2005), 2) Collaborative Filtering (Dias & Fonseca, 2013), 3) Frequent Pattern Mining (Hariri, Mobasher & Burke, 2012), 4) Statistical Models (Moore, Chen, Joachims & Turnbull, 2012), 5) Case-Based Reasoning (Baccigalupo & Plaza, 2006), 6) Discrete Optimization (Hsu & Chung, 2011) and 7) Hybrid Techniques (Vall, Dorfer, Schedl & Widmer, 2018). All these algorithms have one main goal: to automatically create a music playlist that will fulfill the user's preferences.

This is the area on which the current thesis will focus: the criteria of the playlist generation and organization from the users' perspective. The latter one is chosen because the majority of the studies in this field focus on either only analyzing existing music playlists or conducting interviews with a small sample of users or evaluating music recommendations systems in order to identify their opinions. The above studies will be presented below. Moreover, some recent analyses regarding the relation between location as cultural background and listening behaviour, will be discussed.

2.1 Identifying user's perspective

As previously stated, there are three primary methods for identifying listeners' thoughts when they are listening to music or creating a playlist. Firstly, through the evaluation of a proposed music recommender system by the users. Secondly, by analyzing hand-crafted music playlists. Finally, through interview or survey methods. Previous research that used these approaches will be discussed in the next 3 subsections.

2.1.1 Evaluating music recommender systems

Analyzing the outcomes of recommender systems' evaluations is a technique to identify users' preferences in the music listening and music playlist generation processes. In 2002, through the evaluation of 5 different books and movies recommendation systems, it turned out that the user's mood, music style and song's artist are important factors when listeners choose a track for their playlist (Swearingen & Sinha, 2002). Users' perspectives on the music list are influenced by songs' similarities, according to Lee (2011). At the same time, variety, as well as a mix of familiar and new tracks, are important factors.

Through a between-subjects user study in 2018, which asked 123 participants to create music playlists with the usage or not of recommended systems, was proved that homogeneity of music features of the songs (e.g. tempo, energy or loudness) are important criteria during the creation of playlists, regardless the way that they have been generated. However, considering that way of generation, it was found out that recommendation systems could actually help users in the playlist creation by picking at least one recommended song, identifying rare tracks or inspiring them. Unfortunately, the usage of recommendations also led to an increase of difficulty due to the lack of a sufficient user interface in the systems (Kamehkhosh et al, 2018). A more recent work which was conducted by the same researchers of the previous study, containing an updated version of the above task for 270 participants. Again, more than 65% of people used at least one recommended song which confirmed their previous research. Considering the criteria for the playlist creation, homogeneity of musical features is again important along with the artist diversity. However, lyrics of songs came as third in the users' preferences unlike all the previous studies in which either this factor was not examined or did not seem to be important (Kamehkhosh et al, 2020).

2.1.2 Analyzing hand-crafted music playlists

Apart from the above studies that were based on the evaluation of music recommendation systems, multiple studies have been created based on analyses of existing music playlists to discover users' preferences. Slaney and White (2006) addressed the need of listeners to create playlists that cover multiple music genres through the analysis of almost 900 playlists and the examination of the respective tracks and their similarities. About 8 years later (Jannach et al, 2014), 10,000 hand-crafted playlists were analyzed using The Echo Nest and kNN algorithms, in order to identify features that will help with the improvement of music recommender systems. Popularity and freshness of songs along with homogeneity seems to be important characteristics for listeners during the music playlist generation process, as it has been proven again in previous studies.

Recent years, Spotify has become one of the main sources for listening behaviour analyses. One of the most important research regarding Spotify, was conducted by Pichl, Zangerle and Specht (2016). The selection of the music playlists was based on the *#nowplaying*¹ hashtag on *Twitter*. In this hashtag, users can communicate what they are listening to at the moment. By identifying which of these tweets refer to Spotify playlists, researchers collected more than 18,000 lists so they can discover discrepancies regarding acoustical features (tempo, energy, speechiness, acousticness, danceability, loudness, valence and instrumentality). One more time, it was confirmed that listeners prefer multiple kinds of music depending on the mood and the intended use of the playlist. More specifically, it turned out that more than 90% of users created at least one playlist related to the “feel good” mood and that they did neither place “rap” nor “classical” tracks inside a hand-crafted playlist.

2.1.3 Analysing users' opinions through interviews

Cunningham, Bainbridge and Falconer (2006) designed one of the first studies regarding the users' behaviour in the creation of music playlists and mixes. By analyzing 25 posts about creation of playlists and 115 help requests written in *The Art of the Mix*², and by interviewing 13 people, researchers gained valuable insights about the construction task. Specific activities, such as parties, travelling or holidays, turned out to be the trigger that starts the creation process. Apart from these, people tend to make playlists based on artists, genres or styles, too. Another study, which included only 7 participants, found out that mood can play a vital role along with the tempo, rhythmic quality and popularity of the songs (Stumpf & Muscroft, 2011). In 2012, a research that was conducted among 222 participants about the music behaviour that users have during listening, confirmed that mood is an essential aspect for users during the music playlist generation. Moreover, regarding the management of music playlists, the artist, the album and the genre of tracks seem to be important factors. However, because online music services were not very popular at that period, only 39% of participants were using them (Kamalzadeh et al, 2012).

¹ <https://twitter.com/hashtag/nowplaying>

² <http://www.artofthemix.org/>: an online database that contains thousands of music playlists uploaded by users who can also communicate through in-house forums and blogs

2.2 Cultural background as an influence to music

Kroeber and Kluckhohn addressed the word “culture” as:

*Culture consists of patterns, explicit and implicit, of and for behaviour acquired and transmitted by symbols, constituting the distinctive achievement of **human groups**, including their embodiments in artifacts; the essential core of culture consists of traditional (i.e. historically derived and selected) ideas and especially their attached values; culture systems may, on the one hand, be considered as products of action, on the other as conditioning elements of further action (Kroeber & Kluckhohn, 1952)*

In 1984, Hofstede considered “*human groups*” as nations in order to address potential culture differences. Indeed, he created a framework that showed the effect of a society’s culture on humans’ values and the relation with their behaviour (Hofstede, 1984). In the years that followed, national culture was researched in depth, even in the field of music.

A study in 2011, analyzed video footage from a music festival promoted by 3 groups of Arturo’s community³. Researchers discovered that people are more easily enticed to dance by people from their own group than from other groups (Lucas, Clayton, & Leante, 2011). Later in 2016, a group of 100 Tsimane people was studied in terms of their listening preferences. Tsimane is an Amazonian tribe that lives without power or running water and has had minimal contact to Western culture. The results revealed that note combinations that are pleasing to individuals who live in Bolivia’s big towns are not preferred by the Tsimane people. This demonstrates how exposure to certain sorts of sounds, which are part of culture, can influence a person’s musical preferences (McDermott, Schultz, Undurraga, & Godoy, 2016). Finally, a new area has emerged to investigate music in relation to social and cultural contexts, in addition to previous research. *Ethnomusicology* began with the study of non-Western music as a cultural reflection, but in recent decades, the field has extended to encompass Western genres as well (Merriam, 1960).

Music appears to be linked to culture and vice versa, according to the above studies and Ethnomusicology. According to Hofstede’s research, culture can be defined through a person’s geographic region or country. Studies in terms of the use of people’s location in music listening behaviour have been conducted.

Context-aware music recommender systems (CAMRSs) have been explored during the last years. Time, emotions, weather, location etc. are some context attributes that are used when researchers create new approaches in order to fulfill listeners’ needs and expectations. Through the creation and evaluation of *PATS (Personalized Automatic Track Selection)* feature in 2002, an early study addressed the need of taking context information into account when constructing music recommendation systems

³ [Arturos Black Community](#): The black community Arturos descends from Camilo Silvério da Silva who, in the mid-19th century, arrived in Brazil on a slave ship from Angola.

(Pauws & Eggen, 2002). Lehtiniemi (2008) asked 42 users to evaluate a CAMR system (*SuperMusic*) in comparison with random recommenders. The performance of *SuperMusic* in specific situations (e.g. home, work, bus, car jogging etc.) while people listen to music, was poor. Nevertheless, participants found the concept of recommended systems that take into account their current situation, very interesting and promising.

During the next few years, context information started being used. For example, location of the user has been retrieved in a study of relevant songs, based on a specific place of interest (POI) that a listener is travelling to, to be recommended (Braunhofer, Kaminskas & Ricci, 2011). In 2014, a recommender system called Just-for-Me was created by considering both the location of a user and the popularity of songs (Cheng & Shen, 2014).

Nevertheless, location as context is able to be expanded in order to create a whole culture background that can be studied. In 2017, an analysis of music listening behaviour based on cultural data regarding a specific location, was conducted. With the usage of GPS coordinates, researchers: 1) collected songs' acoustical features (the same as mentioned in the above section) and 2) found cultural and socio-economic data for each location/country based on the *World Happiness Report (WHR)*. By combining these 2 kinds of attributes, it could be shown that people from the same or neighboring places tend to have common listening preferences and behaviour (Pichl, Zangerle, Specht & Schedl, 2017).

One more extended study regarding the cultural background, analyzed music listening data of 120,000 users coming from 47 countries. The specific country in which the listener was located was considered as the "cultural background". Researchers created 9 clusters of countries that represented the same listening behaviour. (Schedl, Bauer, Reisinger, Kowald, & Lex, 2021).

In the next section, the gap among the above studies will be discussed in order to prove the need for the current thesis.

3. Problem Statement

According to the previous studies that were mentioned in [Section 2](#), it can be considered that there are 3 types of approaches for the investigation of music playlist generation/organization behaviour:

1. The evaluation of music recommendation systems to assess users' behaviour.
2. The analysis of existing music playlists for the identification of factors that are important for the users during the generation process.
3. The participation of users in the study in order to provide their experiences, thoughts and preferences.

The current study will contribute to the scientific field using the third approach. This has been chosen because the latest experiments take mainly into account the results from hands-on tasks and to a lesser extent the users' thoughts (Kamehkhosh et al, 2018; Kamehkhosh et al, 2020). Apart from that, the most recent study, to the best of our knowledge, that was based only on listeners' thoughts, goes back to 2012.

For that reason, the main aim of this thesis is to fill the gap that has emerged in these last 9 years in which usage of streaming platforms has become bigger (Intermediary Liability, 2020). A questionnaire-based survey will be created in order to collect users' beliefs and provide the relevant results.

Moreover, the study will include the cultural background of listeners as an aspect, as well. As has been mentioned in [Section 2](#), culture may play an important role in the music preferences and listening behaviour of a user. In order to achieve this, the birth country of participants will be included in the research. Apart from this, the residence country will be taken into account in order to explore potential differences when someone lives in a different place than the one he or she was born in. Valuable insights will be given to the scientific community, by analyzing these outcomes, about the differences that different places of the world might have regarding their music culture and behaviour.

4. Research Approach

In order for the current problem to be explored, as mentioned in [Section 3](#), specific research questions have been formalized. In that way, the study will be able to investigate the case by following a guideline. In the first subsection of this chapter, the research questions will be presented and in the second one the methodology that will be followed in order to answer these questions, will be explained.

4.1 Research Questions

The main goal of the current research is to better understand the users' criteria during the music playlist generation/organization process. This is formalized in the following main research question (RQ):

RQ: What do listeners consider when creating or organizing a music playlist on an online music platform such as Spotify and Pandora?

In order for the above main research question to be answered, the problem of the study has been broken down by creating two sub-questions (SQ).

Researchers have been studying the relationship between culture and music since the 20th century. It has been established that they have an influence on one another. In some cases, culture can be linked to an individual's location. During the last years, location of music listeners is used as context for the implementation of better music recommender systems (Lehtiniemi, 2008; Cheng et. al., 2014). However in the field of listening behaviour, the cultural background, which may be related to the place of a user, has not been fully explored. Because of that, the goal of the first sub-question is to identify potential patterns that exist in the listening behaviour of consumers and can be associated with their location.

SQ1: Are there any patterns in the music listening behaviour of users that relate to their cultural background?

Furthermore, many studies have been conducted on the topic of listening behaviour by either analyzing existing user-created music playlists (Pichl et. al., 2016) or interviewing users of music platforms (Kamalzadeh et al, 2012) or evaluating proposed music recommendation systems (Kamehkhosh et al, 2020). In the first case, however, the results are based on ex-post analysis. In the second, the emphasis is on users' perceptions of the system, and in the third, the majority of the research involves

only a small number of participants. As a result, the goal of the second sub-question is to investigate the specific criteria on which users base their personalized music playlists, by taking into account a larger number of consumers and their thoughts.

SQ2: Which are the factors that influence the listeners' behaviour during the music playlist generation/organization process?

4.2 Research Method

To address the above research questions, a quantitative approach is followed. Online music platforms' users and their listening behaviour and music organization were investigated with the usage of the questionnaire-based *survey* method. This method may have started as a research tool for social and economic matters in the start of the 20th century, but its application quickly spread to other research fields (Converse, 1987). The survey approach was used in order to provide responses to the research questions since it allows for the direct extraction of real-life listening behaviours from the "source". Collecting data about what users actually think and do during their listening process, gives the opportunity to the researcher to gain more valuable and actual insights about the topic (Dillman, de Leeuw, & Hox, 2008).

4.2.1 Survey Design

The survey for the thesis was created on the *Qualtrics* platform⁴. The survey's completion duration was an aspect that needed to be considered during the development process. It was important to keep the time below 10 minutes. It has been observed that surveys with less than 10 minutes completion time, tend to have higher response rates (Crawford, Couper, & Lamias, 2001).

The majority of questions were multiple choice closed-ended but there were also some questions in open-ended answer format, so that respondents could express their thoughts in an unrestricted way. Due to the high number of questions (34) the survey was broken into 7 different sections. Each one of them presented a different topic for investigation making the analysis process easier.

The questions addressed 7 topics:

1. Demographics (11 questions)
2. Online music platforms (2 questions)
3. Music listening behaviour (2 questions)

⁴ <https://www.qualtrics.com/>

4. Music playlist listening behaviour (2 questions)
5. Creating music playlist behaviour (7 questions)
6. Characteristics of self-created music playlists (5 questions)
7. Organizing music playlists behaviour (5 questions)

In the first part of the survey, questions about the personal information of respondents were asked (*Demographics*):

- age,
- gender,
- ethnic group,
- level of education,
- marital and employment status,
- birth and residence country,
- years living in the current place,
- whether they have children or not
- as well as their 5 most favorite music genres

The first 6 facts were requested in order for a better understanding of the different characteristics of the population. Moreover, as has been mentioned in [Section 3](#), the cultural background in the current study is based on the birth country of the user. However, the residency nation and years of living are also inquired; living for a long time in a place other than where he or she was born perhaps generates new patterns in the listening behaviour. The next question was whether or not children existed. Trying to figure out if the listening tastes or goals of a generation's music playlists change when people have children. Finally, participants were asked to select their top 5 favorite musical types from a list of 20 options.

Following the next part of the survey (*Online music platforms*), participants were given the option of selecting their favorite music streaming website from a choice of 16 options. In addition, it was requested to indicate whether they had a paid subscription in any of these websites. Because memberships on platforms like Spotify can provide extra features to the users, it would be interesting to identify the percentage of people who make use of them.

Continuing to the next section, the *Music listening behaviour* of participants were explored. Like previous studies (Cunningham et al., 2006; Kamalzadeh, et al., 2012), this research also asked participants to indicate the activities in which they tend to listen to music. The goal of this inquiry was to see if there were possible relations between the characteristics of the listening behaviour and the music playlist generation process, as well as moments of listening. The amount of hours a user listens to music every day is also a key characteristic of their listening activity.

Moving on to the *Music playlist listening behaviour* part, participants were asked to indicate the number of times they tend to listen to the same music playlist. Furthermore, how people choose which music playlist to listen to was investigated. The purpose was to see if people prefer to listen to their own music playlists or pick from the recommended ones based on a specific artist, album, music genre, event, or song. Of course, the option of not listening to any playlists at all was also present.

The next part, *Creating music playlist behaviour* included the most important questions for this work since it was the core of the thesis. The number of automated and self-created music playlists that people have saved in their streaming platforms were asked. These figures could provide more information into whether or not listeners prefer to make music playlists. Proceeding to the next question, participants should use a 5-point likert scale to indicate how often they construct music playlists (Always, Most of the time, About half the time, Sometimes, Never). If a user answered "Never," the system automatically forwarded him to the end of the survey. Otherwise, the next question regarding the reasons why he or she prefers to create music lists, was presented. Once this inquiry was completed, participants should select the 3 most important factors, from a list of 18 options, in which the songs' selection is based on. Some of the choices are directly taken over from previous studies in order to confirm their results (Cunningham et al., 2006; Kamalzadeh, et al., 2012; Stumpf & Muscroft, 2011). The purpose of the next question was to see if listeners use music platforms' recommendation systems to choose the songs for the music playlists (Stumpf & Muscroft, 2011; Kamehkhosh et al, 2018; Kamehkhosh et al, 2020;). Finally, participants were asked how much time (in hours) they spent creating their lists. The question was an open-ended one so individuals could indicate the time it takes to complete the generation process. This figure could be investigated in relation to the use of recommendation systems to see whether they can shorten the process time.

The *Characteristics of self-created music playlists* were studied, as well. Participants were asked to choose the attributes that a self-created music list should have. A list of 8 alternatives was provided: specific number of songs, specific time length, continuous songs by the same artist, smooth transition between songs, common or same emotions when it is listened to, similar lyrics content, specific tempo and similar music genre. They could also indicate a different one if they wanted. Results from earlier research were among the alternatives, which could be re-evaluated and viewed from the cultural perspective (Stumpf & Muscroft, 2011; Kamalzadeh, et al., 2012; Kamehkhosh et al, 2018; Kamehkhosh et al, 2020). Next, the familiarity and the popularity of songs were explored through a 5-point likert scale (Definitely yes, Probably yes, Probably not, Definitely not, Does not matter) (Kamalzadeh et al., 2012). Finally, the average number of songs of a self-created music list were requested for the identification of any potential differences between the countries.

The last part of the survey contained questions regarding the organization behaviour of hand-crafted music playlists (*Organizing music playlist behaviour*). The need for changing the order of songs or the sharing options were answered by the participants. Lastly, individuals were invited to express their thoughts on whether editing an existing music list rather than creating a new one is a viable alternative for them.

The entire survey can be found in [Appendix A](#).

4.2.2 Data Collection

The participants for the survey were selected using the *voluntary response method* (Murairwa, 2015). The link was sent out to students from Utrecht University, family and friends and shared on more than 20 Facebook groups. As a result, answers came from people of various age groups, educational backgrounds, different countries etc., ensuring that the research sample is as representative of the music platforms' users as possible. One more advantage of this method was that because of the host university, that is located in The Netherlands, and the nationality of the author of the thesis, which is Greece, respondents could come from at least 2 different countries. By doing so, the SQ2 question was able to be identified. Finally, the survey was active for 20 days during May 2021.

5. Data analysis

In that period, 342 responses were collected from all the sources in which the questionnaire was distributed. However, because the goal of the study was to compare results from at least 2 countries, only the 276 responses were used. The reason was that these answers, which were coming from Greek and Dutch people, accounted for 81% of total responses. The other 66 replies were excluded from the analysis.

Below, results from the descriptive analysis and statistical tests of each chapter are presented. The data analysis was conducted in Microsoft Excel Office 365 and the statistical tests using R on Rstudio.

5.1 Demographics

From the total of 276 responses, 143 (52%) came from Greece and 133 (48%) from The Netherlands. Females at the age group of 20-29 years old seem to be the dominant respondents in both countries (*Figure 1*). However, in the case of The Netherlands only 4 out of 10 people belong to other age categories whereas in Greece this number is rising to 6 out of 10 persons. Caucasian/white people with a Master degree and with no children are the majority of respondents in both countries.

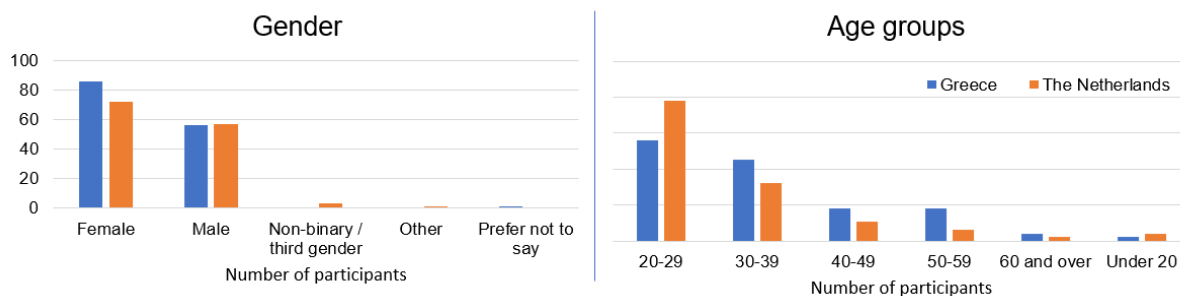


Figure 1

Number of participants per age and gender group, per country

All 276 respondents were asked to indicate their most favorite music genres. As can be seen in *Table 1*, Greek people tend to prefer Alternative music while Dutch are in favor of the Pop genre. The Rock category is high enough in preference in both countries. With the usage of a chi-square test it proved to be a significant relation between the country and the most favorite music genre per country, $X^2 (19) = 32.2$, $p=0.03$.

Greece	The Netherlands
Alternative (21%)	Pop (20%)
Rock (15%)	Rock (13%)
Pop (13%)	Rap (10%)
Dance (13%)	Alternative (10%)

Table 1

Top music genres, per country

5.2 Online music platforms

In the last few years, more and more music streaming platforms have emerged. Consequently, it was important to identify the preferences of people in this field, as well. 55% of Greeks mentioned that they tend to use YouTube to listen to their music, while Dutch people prefer Spotify with a percentage of 60%. This difference is also explained through Chi-square test which proved the existence of strong relationship between the countries and the streaming platforms, $X^2 (9) = 30.6$, $p<=.001$.

In terms of subscriptions, only 36% of Greeks have paid memberships to any music platform. When it comes to the Dutch, this number rises to 61%. This significant relation, between country and membership, was examined and shown using Chi-square test, $X^2 (7) = 28.9$, $p<=.001$, as well. Finally, 84% of Greek people who have any type of membership, they mainly use Spotify and not YouTube.

5.3 Music listening behaviour

As previously stated, people were asked to indicate the most common activities when they are listening to music. Driving is the most frequent activity among all respondents. Working and housework are included in the list, in both countries, with small differences in terms of the percentage. Walking and daydreaming were mentioned as activities by Dutch people with a percentage of 4%, as well (*Table 2*). Finally, from the questionnaire it was obtained that people from both countries seem to listen to music 1-3 hours per day while doing the above described activities.

Greece	The Netherlands
Driving (34%)	Driving (26%)
Working (16%)	Housework (17%)
Housework (12%)	Studying (11%),
Nothing/Just listening to music (11%)	Working (11%)

Table 2

Most common activities when listening to music, per country

5.4 Music playlist listening behaviour

In this category, people were asked about the way they choose which music playlist to listen to. They could select more than one answer. Most of the respondents indicated that their main preference is to listen to their own music lists rather than select a recommended one. However, if it happens to select a suggested music playlist, Dutch people will search one based on a specific artist while Greeks people search for a playlist based on a song or artist. Aside from these options, some people indicated that they enjoy listening to other people's music playlists (*Figure 2*).

It is worth mentioning that Greeks listen to the very same music list less than 10 times while Dutch people more than 50, on average. Indeed, the 133 persons from The Netherlands ($M= 57.3$, $SD= 191.5$) compared to the 143 Greeks ($M=7.6$, $SD=13.6$) appeared higher numbers in terms of listening to the same playlists ($t(274)=-3.01$, $p<=.001$).

How do you select which music playlist to listen to?

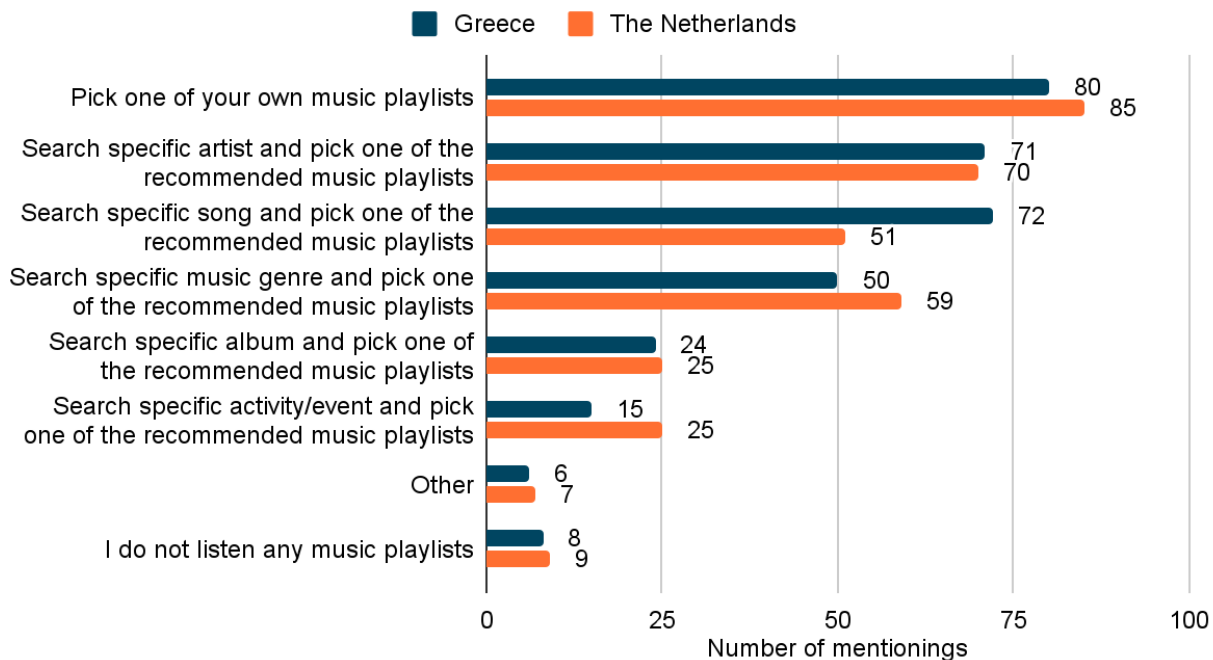


Figure 2

Number of mentionings per way of music playlist selection, per country

5.5 Creating music playlist behaviour

This is the most crucial category in the survey because it contains the required responses for the thesis's purpose. Firstly, participants were asked to point out the number of automated and self-created music playlists they have saved to their account in any music streaming platform. It is interesting to note that Dutch have more handcrafted music lists saved, whereas the opposite is true for Greeks. In terms of comparison between the numbers of automated and self-created lists, the above statement is confirmed through Chi-square test, $X^2(1) = 4.6$, $p=0.03$. However, considering the exact numbers that people provided, it seems that there are no significant differences among the countries when t-test is used (Table 3).

	Automated		Self-created	
	Greece	The Netherlands	Greece	The Netherlands
M	6.1	6.5	6.7	8.5
SD	16.52	18.89	15.86	18.63
df		274		274
t		-0.2		-0.9
p		0.8		0.4

Table 3

t-test for the number of automated and self-created saved music list, per country

From the total of respondents, almost 80% (217 people) create their own music playlists mainly because they are able to edit them in case it is needed. Another case is that they just do not want to forget the songs they like, as some people mentioned. Gathering favorite and familiar songs can be the primary desire, as well (Figure 3).

Why do you create your own music playlists? Because..

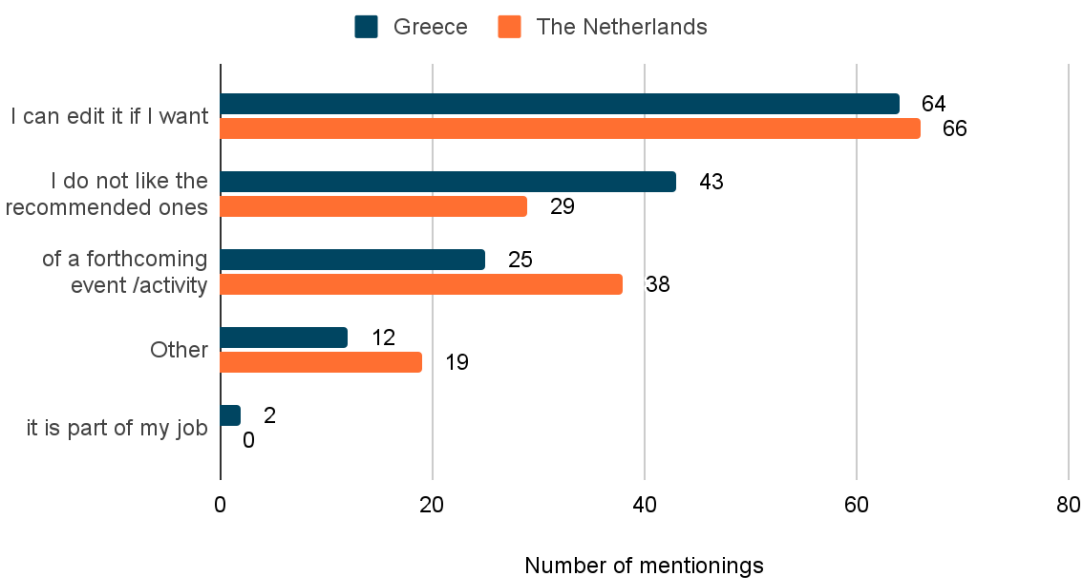


Figure 3

Number of mentionings per reason for creating a music playlist, per country

At this point, it is worth mentioning the key factors that play an important role in the selection of the songs that will be included in the music playlist. People were asked to indicate the three most frequent principles. Respondents from both countries appear to take into account their own mood as well as the music genre they want their music playlist to have. A song's artist can be an important factor, as well (*Table 4*). These findings are in line with results from previous studies (Cunningham et al, 2006; Stumpf & Muscroft, 2011; Kamalzadeh et al, 2012).

Greece	The Netherlands
Mood (35%)	Mood (30%)
Music genre (26%)	Music genre (30%)
Artist (25%)	Artist (23%)

Table 4

Most important principles for songs selection, per country

Choosing the songs on their own, instead of relying on the recommendation systems, is the main way of selection. Nevertheless, in some cases people may search and select the first song by themselves and continue the process using the proposed tracks by the streaming platform. 34% of Dutch and 42% of Greeks follow that technique (*Figure 4*). However, no significant differences in terms of the time that is needed to create the music playlists seems to exist with the usage or no of recommendation systems ($F(1,113)=0.58, p=0.45$).

In what way do you select songs for the new music playlist?

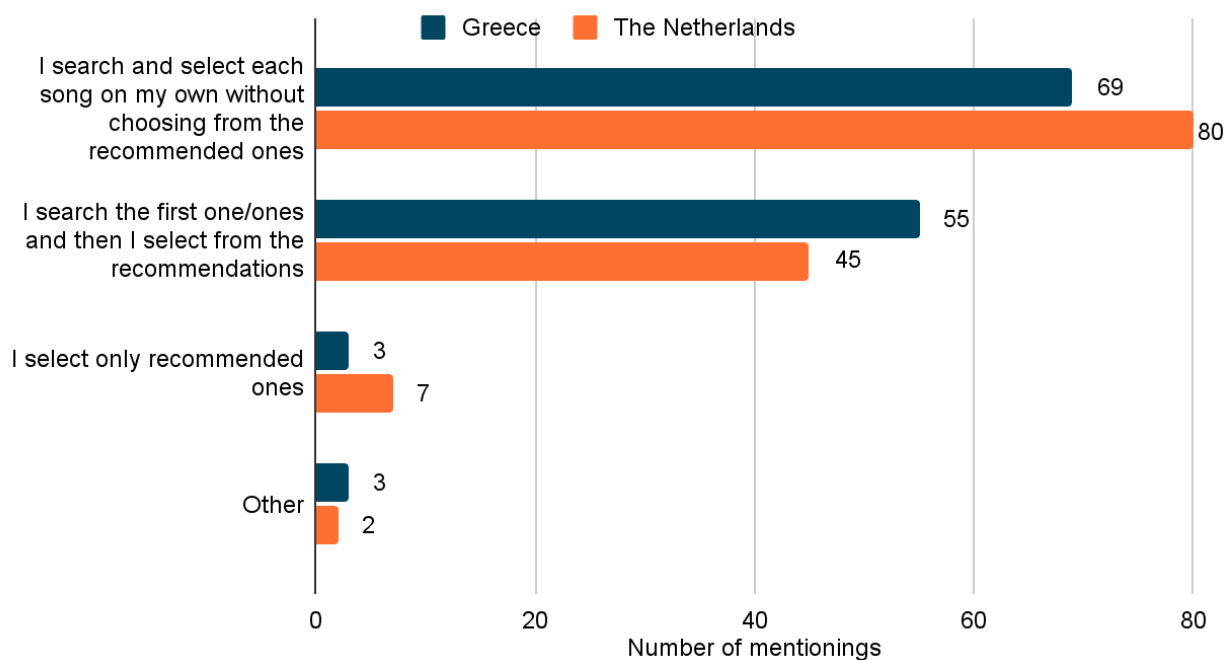


Figure 4

Number of mentionings per way of songs selection, per country

5.6 Characteristics of self-created music playlists

For the people that create their own music playlists, it is of high importance to keep some “rules” inside their lists. Users want their playlists to fulfill specific criteria based on their personal preferences. These preferences could be related with some features of the songs (tempo, smooth transition between them or similar lyrics content) or playlists’ attributes (number of songs or time length). Listeners had to select all these “rules” that apply to them. First of all, the emotions that are created when the playlists are listened to, should be common. Similar music genres among the songs is vital, as well. Apart from that, a smooth transition and a common tempo among the songs is also preferred (*Figure 5*). Through a one-way ANOVA test between countries and characteristics, no significant differences were obtained. Having a large music playlist without specific features can be an option for a few people, as well. The main purpose appears in the following answers: “*Just songs I like, no characteristics*”, “*Me just to like it*” (*sic!*), “*I just create an endless playlist with songs I like that can be from any genre, even though most of them are rock-ish.*”

What characteristics should a self-created music playlist have?

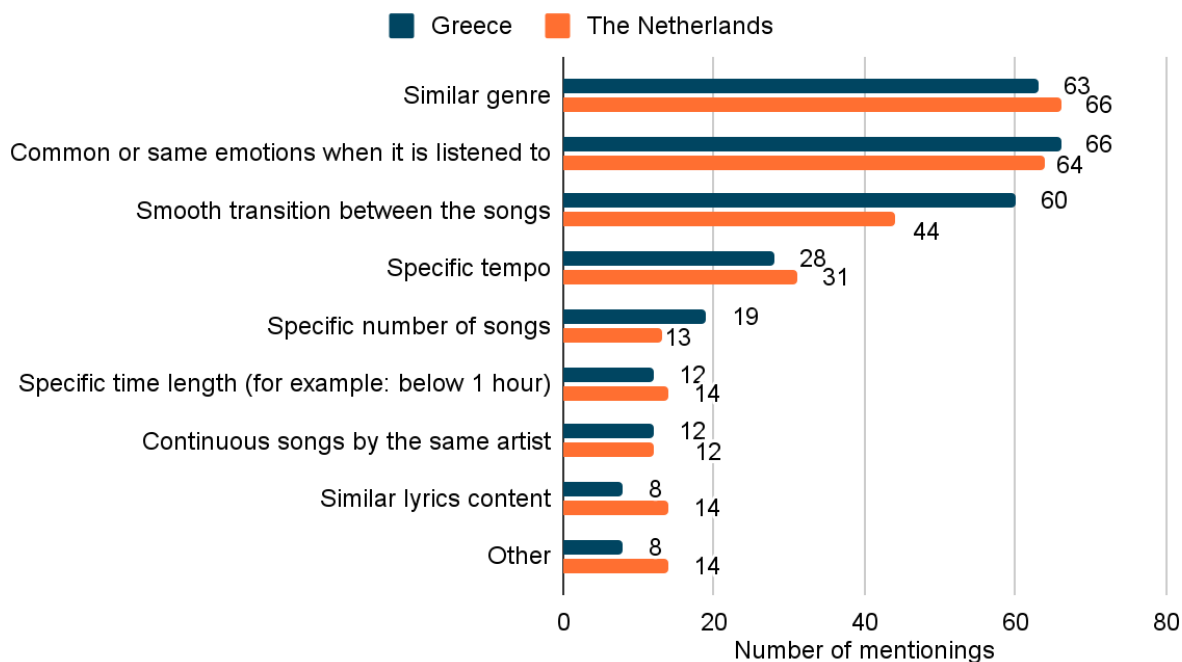


Figure 5

Number of mentionings per characteristic of self-created music playlists, per country

Further, participants were asked about their preferences regarding the type of the songs that are included in a playlist. More than 70% in both countries indicate they probably or definitely want the songs to be familiar (*Figure 6*). When it comes to the first song of the list, whether it is the most popular (*Figure 7*) is not important for any of the nations. Consideration of if it should be their most favorite (*Figure 8*) is significantly unimportant to Dutch listeners (54%), whereas it is only 37% for Greeks.

Should your self-created music playlists contain familiar songs?

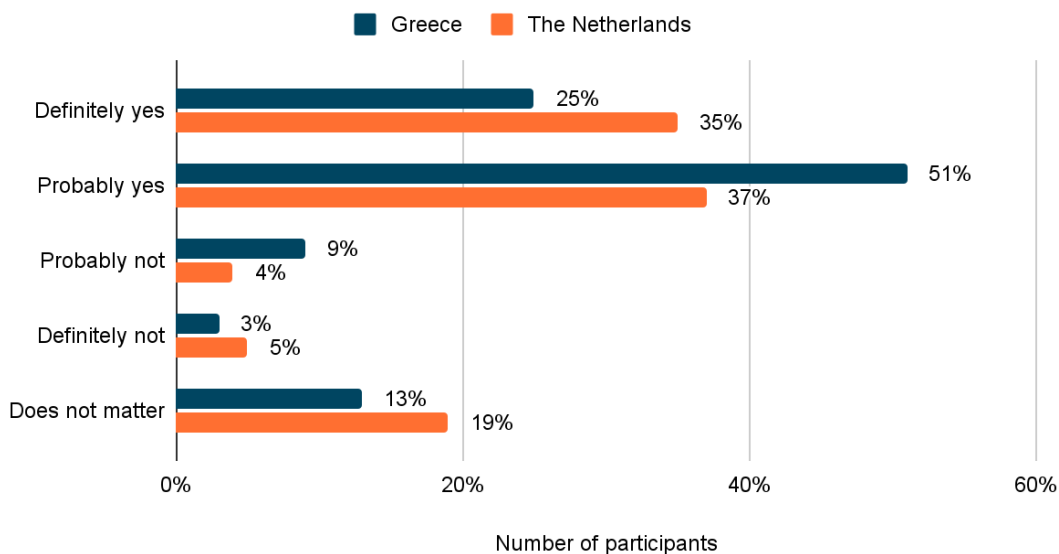


Figure 6

Number of participants per preference in familiarity of songs, per country

Should the first song of your self-created music playlist be the most popular one?

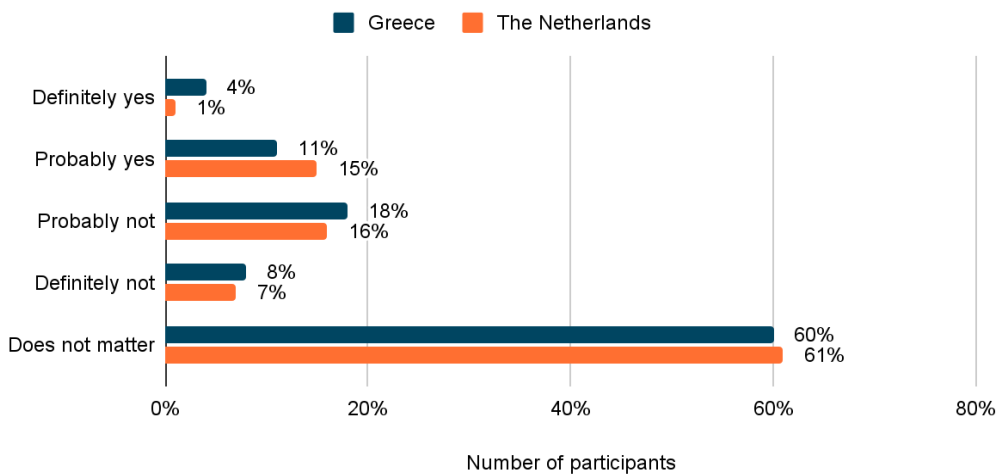


Figure 7

Number of participants per preference in first song's popularity, per country

Should the first song of your self-created music playlist be your most favorable?

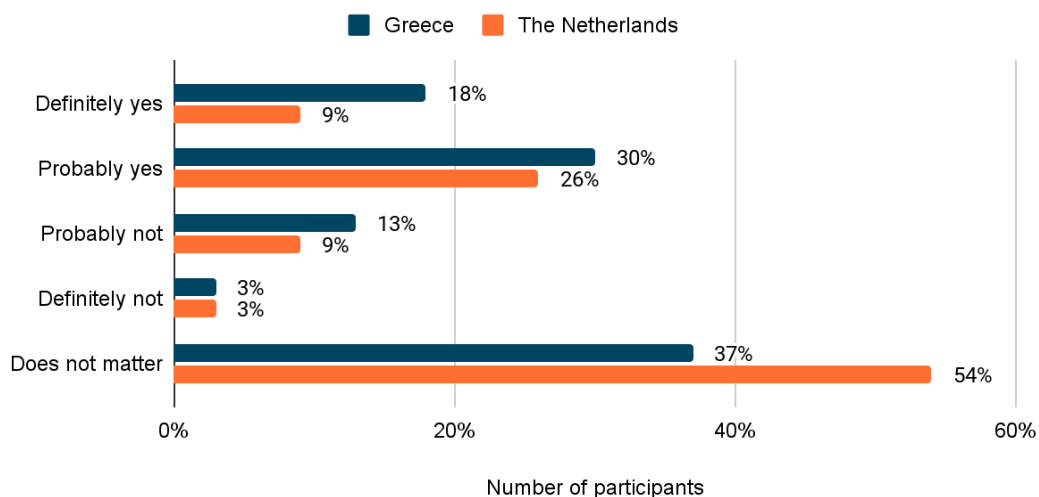


Figure 8

Number of participants per preference in first song's favoritism, per country

Finally, people should indicate the average number of songs that their music playlists tend to have. Nevertheless, no significant effect between countries and the above number turned out to exist (*Table 5*).

	Greece	The Netherlands
M	53.3	84.1
SD	106.8	179.2
df		215
t		-1.55
p		0.12

Table 5

t-test for the number of songs in a self-created music playlist, per country

5.7 Organizing music playlist behaviour

In the final part of the survey, the actions that people do to organize their handcrafted lists were examined. The specific order of the songs does not seem to play an important role as more than 80% in both countries change it while listening to the playlist (*Figure 9*). The study did not reveal whether listeners prefer to manually rearrange them or use the *shuffle* function. Another fact is that 9 out of 10 people, in Greece and in The Netherlands, listen to their entire music playlist (*Figure 10*). When it comes to sharing it, only 39% of Greeks may sometimes send it to friends while this number is rising up to 50% for Dutch people (*Figure 11*). However, a Chi-square test did not show any significant association between countries and the sharing procedure ($X^2(4) = 6.57, p = 0.16$).

Do you change the order of the songs when you are listening to your own music playlists?

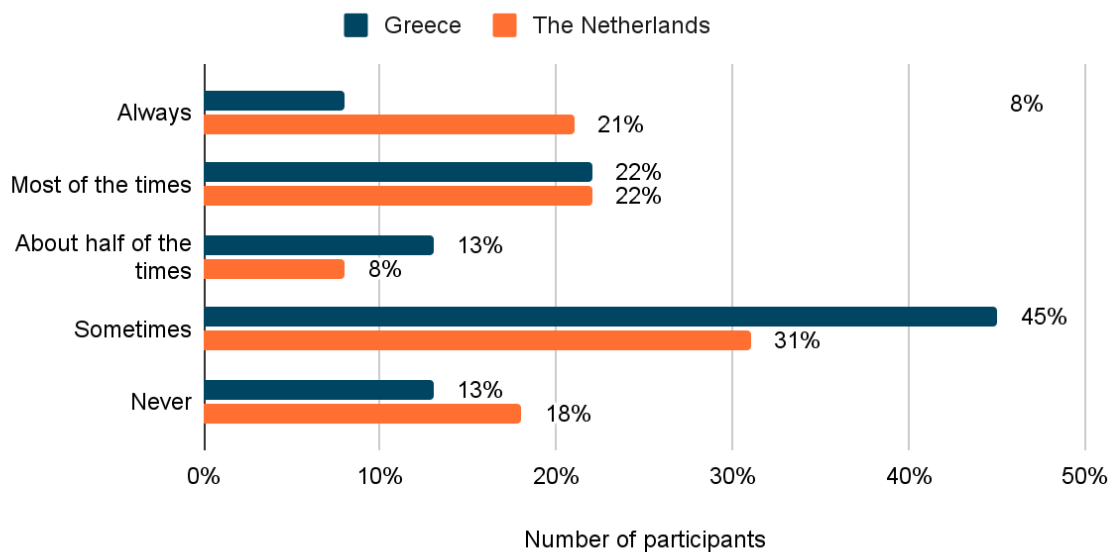


Figure 9

Number of participants per preference in order of songs, per country

Are you listening the entire self-created music playlists?

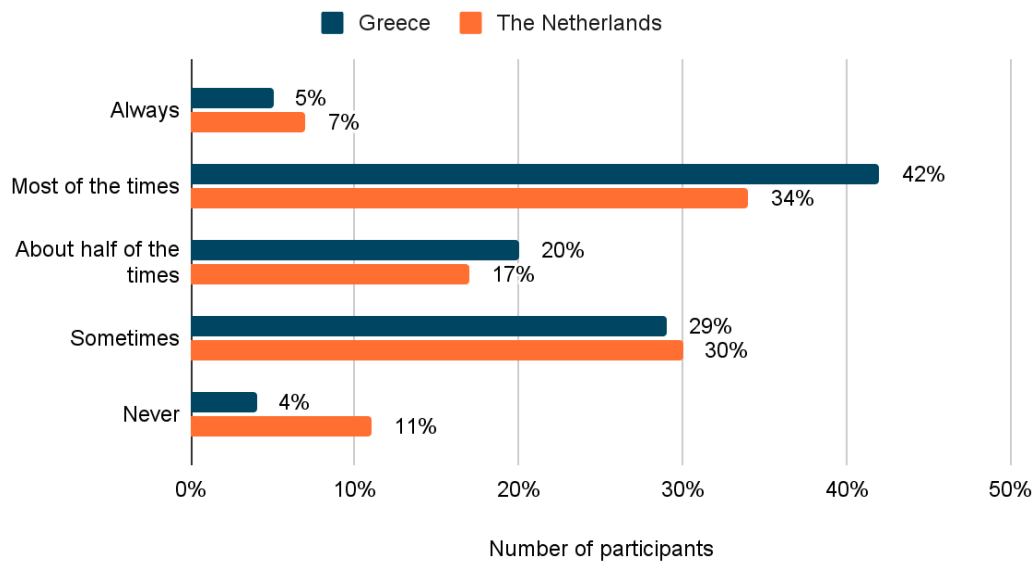


Figure 10

Number of participants per preference in listening entire list, per country

Do you share your music playlists with other people?

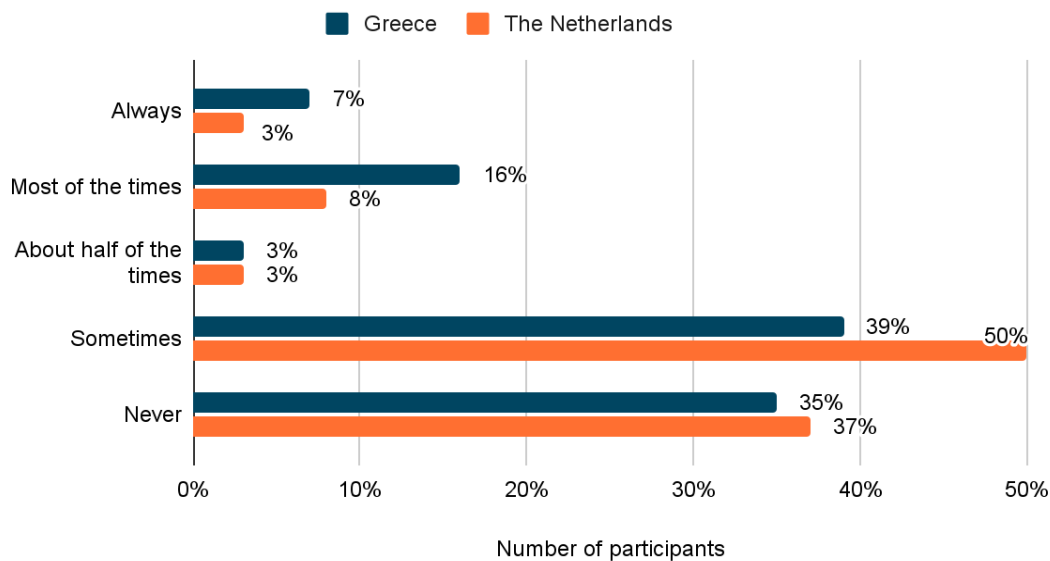


Figure 11

Number of participants per frequency in sharing self-created music playlists, per country

Finally, people coming from both places tend to prefer editing an existing music playlist rather than creating a new one with a percentage of almost 60%. The same is also true in the case of a forthcoming event. However, few people mention that the creation of a new playlist may depend on either their current mood or the available time or how motivated they feel about the specific event.

5.8 Participants in different residence countries

So far this thesis has focused on identifying differences between the two countries. Apart from that, it is interesting to explore the habits that may have changed or adopted in the cases of people living in a different place than the one they were born in. To achieve that, Greeks who live in The Netherlands were examined (66 participants) and the differences that were obtained, are explained.

First of all, no significant difference seems to exist regarding their favorite genre ($X^2(18) = 20.94, p=0.28$). That means that their taste of music does not seem to change when moving to a different country. A small effect appears in their favorite streaming platform because 48% uses YouTube in contrast with 63% of Greeks who live in Greece ($X^2(1) = 2.81, p=0.09$). Following the paid subscriptions, a significant relation has been obtained. The percentage of people who have any kind of membership, almost doubles; 25% for those who live in Greece and 48% for those in The Netherlands (*Figure 12*). This is also confirmed through the chi-square test ($X^2(1) = 7.41, p \leq .001$).

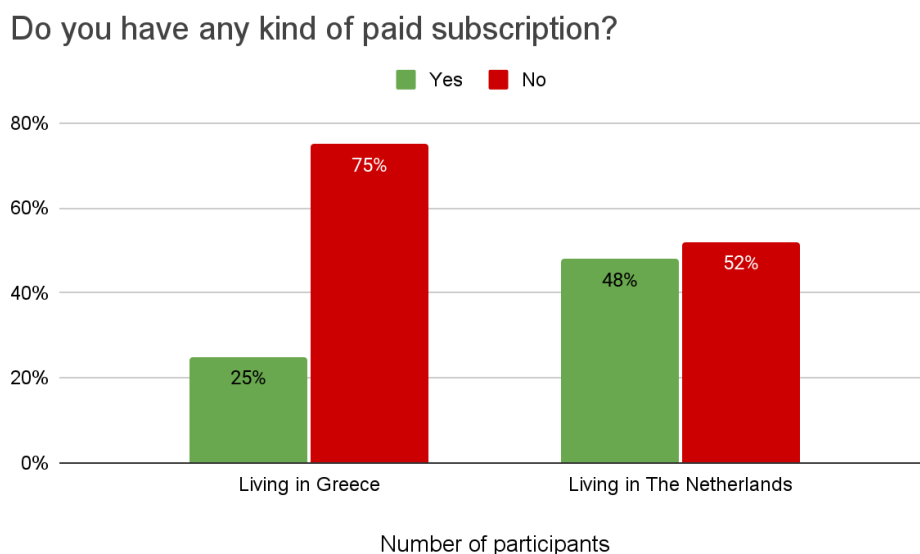


Figure 12

Number of participants per existence of paid subscriptions, per residence country

Moreover, people who live in The Netherlands ($M=9$, $SD= 17.2$) do not adopt the habit of listening to the same music playlist more times than they used to do when living in Greece ($M=6$, $SD= 9.8$; $t(124)=-1.01$, $p=0.28$). Continuing with the automated and self-created saved lists, the different residence country does not appear any correlation ($\chi^2(1) = 1.43$, $p=1.23$).

6. Discussion

Identifying patterns and key factors for the music playlist generation comparing Greek and Dutch people, started by analyzing users' behaviour while listening to music. First of all, the kind of music genres and music platforms that people listen to and use, turned out to be different in the two nations. While Greeks listen to Alternative music mainly on YouTube, Dutch people prefer Spotify for the Pop genre. As previous studies have shown, music preferences can be formed through culture. A recent analysis that included Greece and The Netherlands, clustered 47 countries into 9 groups in order to identify music similarities (Schedl et al, 2021). In the case of Dutch music tastes, the Pop genre emerged as the most popular, which is consistent with the current thesis findings. The group that included Greece, on the other hand, was connected with the psychedelic rock genre. Even though Rock is one of the Greeks' favorite music genres, Alternative has a bigger number of listeners in our study. The number of participants in the above research could be one explanation for the disparity. Greece was in the same group with Mexico, Colombia and Bulgaria. In that cluster, Greece had only $\frac{1}{3}$ of the users of Mexico. As a result, the generalization of the most popular music styles may not be accurate for Greece. It was also explored whether the existence of children could affect the music preferences of participants, but no effect was found.

It is worth mentioning that there are differences in terms of paid subscriptions. While in The Netherlands it is common to have any kind of memberships, Greeks tend to use the free versions of streaming platforms. One possible reason for this could be the discrepancy in GDP per capita between the countries; 52,295 for The Netherlands and 19,581 for Greece in 2019 (The World Bank Open Data, 2020b).

Part of music listening behaviour are also the activities while people listen to music. *Driving* turned out to be the most common task for both countries, which can be proved by previous studies, as well (Volkhin & Agichtein, 2018). In most cases, people choose listening to music instead of talking while being in the car. Relaxation, improvement of mood and concentration tend to be the main reasons (Dibben & Williamson, 2007).

One more frequent activity turned out to be *working*. However, there is only a slight difference between the two countries: just 11% of Dutch people listen to music while working, compared to 16% of Greeks. Perhaps this difference could be explained through the average working hours per week in each nation. In 2019, this number was 38.6 hours for Greece and 29.3 for The Netherlands (Eurostat, 2019).

In terms of listening hours, 1 out of every 2 people in Greece and The Netherlands appeared to listen to music for 1-3 hours each day on average. The average number of times people tend to listen to the same music playlist was an interesting observation. The disparity between the two countries is significant: 7.6 times for Greeks and 57.3 times for Dutch citizens. Of course, the number is considerable,

and more research may be beneficial. The number of times users listen to the same list before altering or deleting it, for example, can be examined. Aside from that, the reasons for the low or high number can be also explored.

When it comes to choosing a music playlist to listen to, it appears that recommended ones are not the first option, in most cases. Both countries' listeners prefer to listen to their own playlists. Unfortunately, there are no research that we are aware of that look at users' music playlist picking habits. A future study could look at these practices in detail in order to provide input to online streaming platforms about their recommendation systems. Nonetheless, the reason why people choose to construct their own music playlists is a first remark that can be derived from the current study. Users, in general, want to be able to change the list at any time. However, a considerable number of people, mostly from Greece, expressed dissatisfaction with the suggested lists.

Continuing, only 20% of Greeks and Dutch seem to not create any music playlists. The remaining 80% behaves differently in terms of self-created and automated soundtrack lists; Greeks store more automated lists whereas Dutch do the opposite. However, when users from both countries create lists, they consider the same things to select the songs; their current mood, the music genre and the artist of tracks. After all, through previous research, mainly from a psychological perspective, it has been shown that mood can affect music choices (Lesiuk 2010; Van den Tol & Edwards, 2015). The order of the songs in the list, on the other hand, appears to be unimportant. When a song is placed #1 in both countries, its popularity or favoritism are irrelevant. A possible cause could be the tendency of rearranging the order of tracks while listening to them; more than 80% of listeners from Greece and the Netherlands do so. Nonetheless, for the vast majority of people, song familiarity is critical which is also in line with previous research (Kamalzadeh et al, 2012).

Apart from what people think when they select songs for the playlists, there are some "rules" that the entire list needs to have. Similar emotions and feelings should be created when the songs are listened to in order to provide a specific mood to the user. This can be achieved by having common songs' music genres, as well.

Recommended systems do not appear to be the most popular way for Dutch people to choose songs; 39% use them whereas this number rises up to 45% for Greeks. Users from The Netherlands are more likely to do their own searches and selections (60%). There have not been many studies or official statistics on users' preferences for music recommendation systems, up to our knowledge. According to a study by Beuscart, Coavoux, & Maillard (2019) that included songs from 4,000 users, just 24% of listening songs were chosen following the recommended algorithms. Nonetheless, because the data is from 2014, the results are unlikely to be valid for 2021. However, the discrepancy between the 2 nations can be used as an example for the future creation and refinement of culture-aware music recommendation systems.

The average number of songs in a self-created music list was also explored. Even if the numbers for the 2 countries were not the same (53.3 for Greece and 84.1 for The Netherlands) the significant difference was pretty low. There was an examination on the relationship between this number and the habit of listening to the complete list, but no link was found. As a result, further investigation is needed.

Except from the above insights, an analysis of Greeks living in the Netherlands was conducted. The objective for this was to look at any potential changes in listening behaviour that can occur as a result of the different country of residence. It turned out that favorite music genres have not been altered due to environmental change. This finding is in line with the findings of a 2019 investigation. It was discovered that moving within the United States had a minor impact on consumers' music tastes (Way, Gil, Anderson & Clauset, 2019). However, it would be fascinating to see if the length of time this migration takes can have an impact.

A small disparity in the use of streaming platforms emerged; 52% of Greeks who have migrated are using Spotify compared to 37% of those who remain in Greece. However, the most interesting is the increase of immigrant Greeks who have some kind of subscription in any music service. From 25% in those who live in Greece, the number becomes 48% in people who have moved out. This difference can be potentially explained with the discrepancies in the GDP (Gross Domestic Product) per capita, as has been mentioned above. When moving to The Netherlands, annual income increases and this may create better conditions for the existence of monthly/yearly subscriptions.

7. Limitations

For this research, specific choices and decisions have been made, which lead to suboptimal results. Below, the limitations that arised, will be discussed.

First of all, it was crucial for a well-designed survey to be created. Questions needed to be well formalized in terms of readability, feasibility etc., in order to prevent any misunderstandings that could lead to errors and false results. In our scenario, participants expressed their concern in response to a single question: “*How many times do you typically listen to **the same music playlist**? Please type a number.*” They were thinking about the lack of a defined time frame. As a result, the answers to this question may not be as accurate as they could be. Another similar issue arose in the form of 4 questions. The replies were to be “dragged and dropped” by the users. Nonetheless, several respondents found the method difficult to comprehend (“*Face validity*”) (Taherdoost, 2016). In addition, the option “Radio” might be added to the query of “*Which online music platform do you usually use for listening to music?*”. Even though it is not an online service, it could provide additional information about the amount of people who actually utilize a streaming platform. A few individuals said they listen to music on the radio most of the time even if they had to choose a service as an answer.

The length of *time* the survey was open could also be a major obstacle. Due to time constraints, the survey was just available for 20 days. If there was additional time, a larger number of responses could be collected, resulting in more accurate results.

The study's participants were chosen using a *convenience sampling* method. Users, particularly Greeks, were contacted through the researcher, and they were mostly friends and relatives. Apart from that, the majority of the Dutch participants came from Utrecht University, the host university. As a result, there's a chance of *bias*. This bias could also be linked to the survey's distribution to multiple Facebook groups. These groups were primarily used to allow people from all around the world to upload questionnaires and collect responses. The procedure was based on “you do mine, I will do yours”. The more surveys a user completed, the more responses his or her survey received. The unlimited completion of others’ surveys without paying attention could lead to wrong or inaccurate results (“*Selection*” threat).

These limitations may be associated with the increased proportion of responders in the 20-29 age bracket in our situation. As Kamehkhosh et al. (2018) indicated, this population consists of users who are most familiar with digital life and services. However, it should be explored whether the habits of the 20-29 age range are also observed in older people. Moreover, the results for those who live in the Netherlands have even another constraint in terms of *external validity*. In this scenario, just 66 Greeks were included. In terms of the actual number of Greeks living in the Netherlands, which rises up to 35,000, this sample is somewhat small (Hellenic Republic, 2020).

As a result of the above limitations, the generalization of the results (*“External validity”*) that have arisen from the survey, have been affected and may not be possible (*“Interaction of selection and treatment”* threat) (Wohlin et. al, 2012).

8. Conclusion and future work

The major purpose of this thesis was to explore potential differences in listening behaviour patterns and music playlist generation between different cultures of the world. In this study “*culture*” related to the birth country of the user. After the collection of responses, the countries with the bigger number of participants were Greece and The Netherlands. 276 responses were collected and analyzed using a questionnaire-based survey.

8.1 Summary outlook

Returning back to SQ1 “*Are there any patterns in the music listening behaviour of users that relate to their cultural background?*” revealed that these countries have differences in their listening behaviour. To begin with, their preferred music styles and streaming platforms differ; Greeks prefer alternative music on YouTube, while Dutch users prefer pop music on Spotify. Aside from that, different service versions are preferred. While listeners in the Netherlands subscribe to premium plans, Greeks make use of free versions. The different annual income in each nation could be a potential reason.

Furthermore, disparities appear to exist in the number of times users listen to the same music playlist. The Dutch participants listen to nearly 8 times more the same list than the Greeks. However, because the corresponding question in the survey appeared to have comprehension issues, more research into the reasons for this could be beneficial. *Driving* is the most popular activity to do while listening to music in both countries. Nonetheless, *working* received a different percentage, with a higher number in Greek responses, most likely due to the higher average weekly working hours.

Considering SQ2 “*Which are the factors that influence the listeners’ behaviour during the music playlist generation/organization process?*” it turned out that listeners from both countries consider the same aspects as important. First and probably most important, they create music lists because they will be able to change them later. Their current mood appeared to be critical in terms of the principles that they take into account when beginning the generation process. Aside from that, music style and song artists are taken into account during the track selection process.

One of the most important findings is that a considerable number of listeners do not prefer the music recommendation systems. In terms of SQ1 and listening habits, people prefer to listen to their own music playlists rather than those recommended by the streaming provider. For SQ2 and the creation process, a number of participants stated that they wish to make their own lists because they do not like the ones that have been proposed. Aside from that, during the song selection process, users from both

countries tend to select each track on their own rather than relying on the recommendations.

8.2 Suggested solutions and features

Based on the above insights some features inside the streaming platforms could be implemented. As previously stated, the most typical activity while people are listening to music is *driving*. Smart gadgets could be used to send information from users to the online streaming platform. A driver's smartwatch, for example, may provide biometric data to a music app while he or she is driving. When the driver's heart rates, for example, begin to drop, the platform may alter the song to something more intense to "bring" him back to reality.

Providers may offer discounts and special offers to users on paid subscriptions throughout the year. Individuals in low-income countries, such as Greece, will be able to benefit from premium plans as a result of this.

When it comes to recommendation algorithms, it has been proven that they are not the first option for people when choosing a music playlist or song. This demonstrates the necessity for greater research and consideration of many factors in their design. Firstly, since Greece and The Netherlands present discrepancies in terms of music preferences, such as in the music styles, recommendations should be implemented by taking into account the different places of the world. By doing so, users may begin to use them more frequently, as previous studies have shown that just 1 or 2 out of every 5 listeners use recommendations, until now.

Aside from the users' location, song familiarity can also be utilised. Because consumers in both nations tend to have recognizable music in their playlists, the suggested tracks may likely be songs that have been heard many times before. Listeners' input can also be used to train recommendation algorithms. More specifically, when a user has listened to a proposed playlist several times, a request for comments can be made. The emotions that these lists elicited in the listener could be a potential query, since they are important based on the current study. As a result, the next time someone searches for "*love playlist*", the results will be based on actual input from prior users.

8.3 Future work

To the best of our knowledge, this is the first study that compares direct outcomes between two distinct locations around the world in terms of listening and playlist generation behaviour. As a result, the findings are more precise and insightful for future usage. However, as indicated in [Section 7](#), due to some limitations, generalization of

results may not be impossible. To deal with this issue, future research projects could include either more participants or other nations to investigate. Particularly, if additional nations are explored, stronger global comparisons can be made. Some ideas for future research are proposed below.

To begin, a future project could integrate questionnaire and interview approaches as a result of ambiguities in some questions. Potential explanations to participants will be possible and as a result more accurate responses will be collected. Aside from that, the time range might be extended to increase the amount of data gathered from the process. Focusing on older age groups, rather than the 20-29 year olds, would also be a good principle. The majority of participants in most studies are in this age group. As a result, it would be worthwhile to learn about other people's tastes as well. Finally, the investigation of users in other countries than Greece and The Netherlands, will provide extra insights to lead to generalization. In particular, adding Asian or African nations will probably provide more valuable results due to the different cultural backgrounds.

The potential differences in the listening and playlist generation processes in respect to the activities is also something worth investigating. Bicycles, cars, and trains are the primary modes of transportation in The Netherlands. It could be interesting to see if listeners use music platforms differently in each situation, or if their custom-made playlists have different characteristics in each case. For example, while riding, playlists might have relaxing songs, whereas on the train, lists might include tracks with varying tempos.

Further analysis could be possible based on *Figure 9*, which visualized listeners' tendency of changing the order of their music list while listening to it. Listeners do not employ the shuffle function while passive listening (work or exercise), according to previous research (Kamalzadeh et. al., 2012). It would be interesting to know whether people prefer to manually rearrange tracks or use the shuffle feature in connection to their birth country.

The relationship between migration and listening habits is also something worth looking into. In this study, only 66 people were investigated in this condition. It's worth examining whether the changing environment affects people's music choices and behaviour, especially given that over 272 million people around the world are immigrants (International Organization of Migration, 2019). More research into the years that an individual spends in a location other than his or her birth country could add to the field's knowledge.

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Appendix

A. Survey

Survey for the analysis of criteria during the music playlist creation process

The current questionnaire is part of the thesis "**A cross-cultural study of criteria in the music playlist generation**" which is conducted from Nefeli Georgia Argyropoulou (n.g.argyropoulou@students.uu.nl) as part of her MSc in Business Informatics at Utrecht University. Goal of this survey is the investigation of the criteria that lead a listener of a music platform **to create his/her own music playlist**. Answering the questions will take no longer than 10 minutes and your responses will remain confidential.

→

Demographics

What is your age?

- Under 20
- 20-29
- 30-39
- 40-49
- 50-59
- 60 and over

What is your gender?

- Female
- Male
- Non-binary / third gender
- Other
- Prefer not to say

What is your country of **birth**?

What is your country of **residence**?

How long have you been living in the **country of residence**?

- Less than 1 year
- 1-5 years
- 6-15 years
- 16 years or longer

With which ethnic group do you most identify with?

- African American/Black
- Asian/Pacific Islander
- Caucasian/White
- Hispanic
- Indigenous or Aboriginal Person
- Latino
- Multi-ethnic
- Other (please specify):

What is the highest level of education you have completed?

- Primary school
- High School or equivalent
- Bachelor's Degree
- Master's Degree
- Doctoral Degree (PhD)
- Professional Degree (MD, JD, etc.)
- Other (please specify):

What is your marital status?

- Single
- Married/In relationship
- Widowed
- Divorced
- Separated

Do you have children?

- Yes
- No
- Prefer not to say

What is your current employment status?

- Full-time employment
- Part-time employment
- Unemployed
- Student
- Other (please specify):

Which are your favorite music genres? Please select **at least the 5 most favorite** ones and rank them **by order of preference** (drag & drop).

Alternative
Children's
Classical
Country
Dance
Electronic
Folk
Funk
Heavy metal/Hard Rock
Hip hop/Rap
Jazz
K-pop
Latin
Oldies
Opera
Polka
Pop
R&B/Soul
Reggae
Rock
Other (please specify): <input type="text"/>

Online Music Platforms

Which online music platform do you usually use for listening to music?
Please select **at least the 1 most used** one and rank them **by order of frequency** (drag & drop).

Spotify
Pandora
YouTube
Soundcloud
Apple Music
Mixcloud
Tidal
Amazon Music
last.fm
LiveXLive
SiriusXM
Deezer
Qobuz
iHeartRadio
Other (please specify): <input type="text"/>
I do not use any online music platform

Do you have a paid subscription at any online music platform?

Yes

No

Music listening behavior

What kind of activities do you do when you are listening to music?
Please select **at least the 5 most frequent** ones and rank them **by order of frequency** (drag & drop).

Driving
During/before sleep
Housework
Nothing (just listening to music)
Party
Personal activities
Playing games
Reading a book
Sex
Studying
Training/Working out
Travelling
Working
Other (please specify): <input type="text"/>

How many hours are you listening to music **per day**?

Less than 1 hour

1-3 hours

4-8 hours

9 hours or more

Music playlist listening behavior

How many times do you typically listen to **the same music playlist**?
Please type a number.

How do you select which music playlist to listen to?

- Pick one of your own music playlists
- Search specific **artist** and pick one of the recommended music playlists
- Search specific **album** and pick one of the recommended music playlists
- Search specific **music genre** and pick one of the recommended music playlists
- Search specific **activity/event** and pick one of the recommended music playlists
- Search specific **song** and pick one of the recommended music playlists
- Other (please specify):

- I do not listen any music playlists



Creating music playlist behavior

How many **automated** music playlists have you downloaded/saved? Please type your answer (just a number).

How many **self-created** music playlists have you created/saved? Please type your answer (just a number).

Do you create your own music playlists?

Always

Most of the time

About half the time

Sometimes

Never



Why do you create your own music playlists? Because...

- of a forthcoming event/activity
- I do not like the recommended music playlists
- it is part of my job
- I can edit my music playlists
- other (please specify):

When I create a new music playlist, selected songs are based on...?
Please select **at least the 3 most frequent** reasons and rank them **by order of frequency** (drag & drop).

the artist
the music genre
the title
my mood
the popularity
the rhythmic quality
the lyrics
the tempo
the date (for example: 80's)
the audience type (for example: music playlist for children)
the time of listening (for example: in the morning)
the freshness (recently released)
the goal of the music playlist (for example: work out, party, etc)
the danceability
the loudness
the instrumentality
a specific period of my life
other (please specify):
<input type="text"/>

In what way do you select songs for the new music playlist?

I select only recommended ones

I search the first one/ones and then I select from the recommendations

I search and select each song on my own without choosing from the recommended ones

other (please specify):

How much time (in hours) do you spend in the creation of music playlists process? Please type a number.



Characteristics of self-created music playlists

What characteristics should a self-created music playlist have?

- Specific number of songs
- Specific time length (for example: below 1 hour)
- Continuous songs by the same artist
- Smooth transition between the songs
- Common or same emotions when it is listened to
- Similar lyrics content
- Specific tempo
- Similar genre
- other (please specify):

Should the **first** song of your **self-created** music playlist be your most **favorable**?

- Definitely yes
- Probably yes
- Probably not
- Definitely not
- Does not matter

Should the **first** song of your **self-created** music playlist be the most **popular one**?

Definitely yes

Probably yes

Probably not

Definitely not

Does not matter

Should your **self-created** music playlists contain **familiar** songs?

Definitely yes

Probably yes

Probably not

Definitely not

Does not matter

How many songs does a **self-created** music playlist typically consist of?



Organizing music playlist behavior

Do you change the order of the songs when you are listening to **your own** music playlists?

- Always
- Most of the times
- About half of the times
- Sometimes
- Never

Do you share **your** music playlists with other people?

- Always
- Most of the times
- About half of the times
- Sometimes
- Never

Do you prefer to edit **your** music playlists or create new ones?

- Edit my music playlists
- Create a new one
- It depends (please specify):

Are you listening the entire **self-created** music playlists?

Always

Most of the time

About half the time

Sometimes

Never

Before a specific activity or event (e.g. party, working out, travelling etc), do you create a new music playlist or do you listen an already made one?

I listen to an existing music playlist

I create a new music playlist

It depends (please specify):

