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Improving the User Experience of Mobile Collaborative Playlists

User experience design factors of affordances and perception of control

Master's thesis in Interaction Design & Technologies

GABRIELLA THORÉN & MICHELLE TRAN LUU

MASTER'S THESIS 2020

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Abstract

Music plays a significant role in people's everyday life. Not only is music a major element of individual's own activities but also in social activities. This has resulted in an uprising trend of multi-user music experience in audio streaming services. One of these social features are collaborative playlists. This kind of playlists can be simultaneously accessed and modified by multiple users and collaborative playlists are believed to enhance the social ambiance as well as to facilitate the discovery of music in the group. One of the biggest challenges when designing collaborative playlists is to cope with simultaneous users and various preferences they have while interacting with the same user interface. However, not many studies have been investigating these issues which resulted in the topic to be underexplored. The aim of this thesis project was therefore to identify user experience design factors in terms of affordances and perception of control in collaborative playlists designed for mobile phones. These design factors are complemented with a set of design guidelines that address the identified design challenges. To reach the project goal, this thesis followed an iterative user-centred design approach and was examined in the context of the industrial use case. Each step of the design process influenced the next steps with its collected insights and the final design concepts were validated with user tests. Based on the knowledge gained from the process, the design factors and guidelines were derived directly from the data collected through user studies.

Keywords: User Experience, Interaction Design, Collaborative Playlist, Social Music Listening, User-Centred Design, Affordances, Control.

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1

Introduction

Recently, many e-services have become more socially oriented. They are no longer just serving the individual, but rather a social group [26]. These services are aiming for a multi-user experience just as much as single user one. Similarly, streaming music has long been a solo experience, but it is also gradually becoming a part of social activity itself [32]. Several audio streaming services encourage users to share and listen to music together with friends and family. Some examples of such services include Spotify [21], Apple Music [5] and TIDAL [12]. As the trend of increasing the multi-user music experience is uprising, this thesis focuses on one social music feature called *collaborative playlists*. Such playlists can be simultaneously accessed and modified by multiple users, creating a collaborative experience of music [44]. With smartphones being the most commonly used device for listening to music [55], this thesis is focused on the design of mobile experience of such playlists.

One of the biggest challenges when designing collaborative playlists is how to cope with several simultaneous users and various preferences they have while interacting with the same user interface. Thus, interaction designers developing collaborative playlists need to take into account a multitude of design factors to address these challenges. One important factor is the extent of control each user has over the collaborative playlist, while another is the affordance of the functionality itself. The users must be aware of what the collaborative playlist enables them to do and at the same time it needs to be clear to them what the other users are doing within the playlist [58]. On top of this, mobile design entails additional challenges such as limited screen space [13] and smaller targets [53], making the design of collaborative playlist even trickier to solve.

1.1 Aim and Research Question

The aim of this thesis is to study and identify the design factors influencing the affordances and perception of control of collaborative playlists used on mobile devices. The research question this thesis is aiming to answer is stated as follows:

What UX design factors in terms of affordances and user's perception of control should be considered when designing mobile collaborative playlists?

The expected outcome of this work is a set of design guidelines for collaborative playlists with special regard to the user experience aspects specified in the research question of this thesis. The guidelines will be developed based on an evaluation of a prototype of an enhanced collaborative playlist design and the results will be used by the company hosting this thesis to improve this aspect of their product.

1.2 Stakeholders

Following is a list of several stakeholders identified for this thesis:

- **Thesis Authors**
Gabriella Thorén and Michelle Tran Luu.
- **Chalmers University of Technology**
The university administering the thesis.
- **Spotify AB**
The company hosting this project and providing it with the industrial use case. They will be interested in the process and results to enhance their own collaborative playlist feature.
- **End-Users**
Another major stakeholder will be the existing and new end-users, since they will be the ones affected by our research.

2

Background & Related Work

This thesis is concerned with the design of collaborative playlists for mobile platforms. As collaborative playlist has its origin in the way humans socialise using music [22], it is of fundamental importance to understand the meaning of social music experiences in the society. In this chapter, the concept of social experiences of music is described, followed by a definition of collaborative playlists and related works in these areas.

2.1 Social Experiences of Music

In a large number of psychology studies, music has shown an impact on individuals' state of mind [35, 32]. Music is believed to associate with people's mood, to enhance particular emotions and physical state. In addition to this, music is trusted to help invoke personal experiences and shared memories. An example is how happy songs can increase one's happiness while sad songs can make a person feel empathy [35]. Another study on global consumption conducted by IFPI [28] states that music not only has an impact on the state of mind, but also a significant role in people's lives. This study showed that music consumers all over the world spend an average of 17.8 hours listening to music each week, which results in 2.5 hours a day. Based on these studies, a conclusion can be drawn that music has a non-negligible role in everyday lives of people.

Alongside the importance of music in people's everyday lives, music has also great impact on social interactions. It often acts as a social bonding activity, for instance when listening to music together or discussing music preferences [56]. These discussions can evolve to music sharing experiences, by helping people discover music when being introduced to new songs by one another [44, 56]. By doing this, friends can influence each other's music tastes and get a more diverse music library. According to the study by Lehtiniemi et al. [31] consuming others' playlist is indeed a main method of music discovery.

Our review of the literature on this topic suggests that music is undeniably of importance to social interaction. However, as Park et al. [44] have found, much of the social part of music listening have been stripped away and have become more of an isolated experience.

2.2 Collaborative Playlists

A collaborative playlist is one feature that is making listening to music a social experience by enable multiple users to listen and edit a collective playlist. The initial motivator for collaborative playlists was to share music and enable collaborative engagement in the selection of music [42]. Park and Kaneshiro [43], argue that collaborative playlists engage users in finding new music. In their study, one participant was feeling forced to listen to a song other collaborators have added, however the feelings emerged into happiness. As a matter of fact, the user felt pleased to have experienced a sense of obligation to give the song multiple listens. Thus, Park and Kaneshiro [43] claim that many users of playlists are more open to listening to new music when being added to a shared playlist. The reason for this is partly because some listeners want to show respect by not deleting songs added by someone else. Other feel forced to listen to the songs when an effort has been made, and ended up enjoying the song. As this study was only conducted in the United States of America, one can argue whether or not this conclusion is culture-dependent.

Moreover, the music discovery behaviour was also identified in another study by Liu and Andersson Reimer [32]. The participants of their study expressed willingness to give a disliked band or songs another try since it was selected by a person they know. This shows that the collaborative playlists can have a positive social effect on supporting interactions between people and music exploration. Yet, the role of collaborative playlist often becomes something else and the way it is used is dependent on the context [40]. Park and Kaneshiro’s analysis [43] showed that some people would rather use the collaborative playlist for nostalgic reasons by remembering the music they listened to and the feelings associated to these songs. As a result, the collaborative playlist became a list of historical records of shared songs, rather than being continuously updated and refined.

Another issue with collaborative playlists is that there is often an imbalance in ownership and contributions. As one party engages more than the other, the less-contributing party stops using it. In some cases, the contributing party enjoys having more of their own songs in the playlist, while in other cases they also stop using the list due to the lack of engagement from the other part. To engage users in mutual interaction and keep them motivated to continue interacting with other collaborators is one of the biggest challenges with collaborative playlists [43].

While collaborative playlists aim to encourage people to share and select music together, Cunningham and Nichols [22] suggest that fear of being judged can prevent people from engaging in the music selection. This study investigated the difference

between people that selected songs in a party gathering and those that did not. What was found was that the guests did not change songs that often even though they were encouraged to do so since they believed it would be rude to the host who had selected the initial music. Some believed that music could expose them in both good and bad ways, and were therefore worried about how they would be perceived when selecting songs. The participants also stated that it is less intimidating to share music with friends and family than with strangers. However, another study by Park et al. [44] showed that participants believe there are benefits of sharing with strangers such as the ability to discover new music.

To sum up, collaborative playlists are shown to bear a great influence for discovering music as the users are more receptive to new songs. Apart from being a great source for discovering new music, collaborative playlists are proved to be used as historical records of music. Moreover, two issues alluded from the studies which may be closely connected, the imbalance in contributions as well as the fear of engagement. This is two crucial aspects to bear in mind when designing for collaborative playlists.

2.3 Similar Studies

Several versions of collaborative playlists have been investigated in various studies. One example is the study about the interaction with a MP3 Jukebox called *Jukola* conducted by Ohara et al. [42]. This jukebox was placed in a café bar to find out how participants in a public space would decide which music to play. The music selection was based on the participants voting for and down voting songs on a handheld display. The handheld device was popular among groups and became a social hub to discuss music and what song to play next. These discussions did not only increase social interactions, but also encouraged debate, negotiations and playful behaviours around the playlist. Another similar study with a public setup by Müller et al. [40] showed that this activity triggered participation as well as competitive behaviours among groups, since participants tried to convince each other to vote or down vote. By selecting the music together, the music tastes was shared and exposed to people in this context.

An additional study examining music recommendations based on user emotion was done by Bauer et al. [17]. The study showed that music is important in social gatherings, however, the challenge is to create a playlist that suits everyone's taste and the mood of the group. The authors developed *MoodMusic*, a method for creating collaborative playlists that uses the group's music preferences and the intensity in the conversation to determine what playlist to create. To accomplish this, *MoodMusic* makes use of historic logs in the social music website *Last.fm* to find the group's music preferences and keeps tracks of the intensity in the conversation based on the volume and pitch height of the participants. As not much research has been conducted to detect the mood of a group, Bauer et al. [17] provide this method as an attempt, but suggest that additional user studies should be made to evaluate its success.

Another study by McCarthy and Anagnost [38] investigated a group preference adaption system. The system was called *MusicFX* and created playlists for gym members. Each gym member was registered to the system when scanning their identification badge while entering the fitness center. The information was used to decide what music to play in the gym by choosing songs based on the overlap in music preferences of the signed in members. According to the study, MusicFX was enjoyed by the participants whom appreciated the possibility to influence their environment, and the authors argued that the technology could be adapted to other areas, such as restaurants, where musical preferences can enhance the atmosphere and make it more personalised.

What can be found from the work on Jukola [42], MoodMusic [17] and MusicFX [38] is that collaborative playlists can be shown to elicit different user behaviours as well as to form the social ambience in the group. However, they are all exploratory public installations which might not work for collaborative playlist used in a more private context. There is a risk that people care less about the music selection when it is to be played publicly rather than when a user actively selects music to listen to. As the academic research is lacking in this area, a relevant non-academic study by Kuroda [30], a user of the online publishing platform *Medium*, is worth mentioning. Kuroda wrote a blog post about an *Advisor Playlists* feature he has prototyped. This feature works on top of the audio streaming service *Spotify* with the aim to turn the process of music recommendations from friends into a fun and collaborative experience. For this individual research effort, Kuroda posted user surveys on several online platforms and discovered three issues with the existing collaborative playlist feature. One of the findings found was the lack of engaging social features. His study of 85 responses showed that the average rating of satisfaction with Spotify’s social features was 3 out of 5. Another discovery was among music recommendations in which his results suggested that 23.5% of the users he surveyed wanted recommendations from friends. As for the last finding, he analysed the existing collaborative playlist feature on Spotify and explained the biggest issue as users not being able to customise privileges. Based on the findings, the Advisor Playlist was formed where only the owner of the playlist could modify the playlist. The collaborators with the role *advisor* in this playlist could suggest new content to the playlist without having permissions to add or delete songs.

Despite the existing body of academic research cited above, Park et al. [44] claims that there is a need for more relevant work around this field. The works on the topic have been published between 2004 to 2017 and, thus, one can draw the conclusion that collaborative music experience is clearly a topic of ongoing research efforts. The studies not only state the importance of a collaborative music experience, but also showcase that it can enhance the social relationships in the group, help users explore music as well as feeling the appreciation of including songs that reflect upon their needs and experience. Yet, the above studies also present a diverse perspective of collaborative playlists that the thesis will need to investigate further, for instance making the music selection between collaborators more evenly distributed, involving the social aspects and having playlists with different ownership types.

3

Theory

This chapter presents the review of theory relevant for this thesis. As the focus is on collaborative playlists, theories will centre around designing collaborative experiences. Therefore, it is important to obtain understanding on what factors are essential when designing for multi-user interfaces. User-centered design and frameworks related to designing for mobile platforms are also discussed later in this section. They will provide conceptual foundations for dealing with the complexity of a wicked problem which the design for the mobile collaborative playlists can be classified as.

3.1 Co-experience

Collaboration has long been an integral part of life since humans are social creatures that tend to collectively make efforts toward the same goal [45]. The passion for collaboration has influenced people to create ways to make existing modern technology services support them in social interactions [16]. Virtual collaborations open up for new opportunities by removing the geographical limitation. On the other hand, new challenges emerge when regular communication ways cannot be utilized [45].

Even though the phenomenon of digital collaboration is arising, not much research has been done in this area within design. What could be found was Batterbee's [15] study about, what she calls, *co-experience*. Battarbee states that co-experience is "*the seamless blend of user experience of products and social interaction*". In fact, Battarbee believes that co-experience does not only define the individual side of an experience but also needs to embrace the entire group's experience as well as the social side. Batterbee describes co-experience as collaborative and creative, by being four-fold [15]:

- **Social**
Co-experience relies on communication.

- **Multi-modal**

Co-experience can take many forms. It can be experienced through face-to-face communication, or via different kinds of technology.

- **Creative**

Co-experience facilitates creativity. When people collectively are using a design, the results are more creative than when using it in solitary.

- **Fun**

Fun is a big driving force behind co-experience. Co-experience is happening when people do something together for pleasure, to pass time, to keep in touch and to socialise.

According to Battarbee [16], co-experience can take two different dimensions by being either *explorative* or *organised*. Organised co-experience refers to experiences and events that are planned, such as parties. In these events participants are well-prepared for the collaborative experience in contrast to how it is when an event is explorative. In explorative co-experiences, events and experiences happen when a suitable spontaneous moment appears. While designing for co-experience it is therefore essential to consider both of these dimensions, as they together comprise the whole experience [16].

As co-experience involves multiple participants and thus also many and various preferences, it is by no means an easy task to maintain a good co-experience among them. For instance, Yuill and Rogers [58] provided a design framework for multi-user interfaces that includes three core mechanisms of collaboration. One of them is the awareness of others. This points to the degree in which users are aware of the ongoing actions and intentions of other users. This core mechanism is important since users need to obtain information and be aware of the other users in order to be able to coordinate their own efforts and engagement. Additionally, this should be seen as a circular path where user A is aware of user B, user B is aware of user A, but also that both of them are mutually aware of each other's awareness [58]. These same arguments are stated in the literature by Reimer et al. [45], who also emphasize the importance of awareness to enhance the team feeling and the social connection to the others. This is what Batterbee [15] would call a co-experience.

The second mechanism revolves around how users are provided various opportunities to control the interface. Granting users control over the interface needs to be carefully considered since it can decrease user satisfaction. When too many users are taking actions in the same interface without any constraints, it is easy to lose coordination. Therefore, it is of fundamental importance in multi-user interfaces to consider to what extent each user should be able to control over actions and decisions. The level of user control can be provided or denied, however it is important to have a balance between too much and too little control, as interfaces with high levels of control can cause frustration and disengagement, while too low can create chaos in coordination [58].

As of the last mechanism, availability of information is concerned. In multi-user interfaces, providing background information is particularly important because not only does it influence user's awareness and control, but it also provides relevant information of the ongoing process and the history of interactions [58].

The collaborative playlist feature being a multi-user product, promotes social interactions and also implies co-experience. Consequently, it is of great importance to consider these three core collaboration mechanisms of awareness, control and information availability when designing for co-experience in such playlist.

3.2 Design Frameworks

As the work of this thesis will be conducted using interaction design methods, there are three frameworks that will be of the main focus: *Design thinking*, *User-centred design* and *Mobile design*.

3.2.1 Design Thinking

Design thinking is a design methodology aimed to solve complex problems by understanding user needs and creating user centered solutions. Design Thinking is often approached by following the five iterative stages: *empathise*, *define*, *ideate*, *prototype* and lastly *test* [52]. Interaction Design Foundation [52] describes each stage in the process as follows:

1. **Empathise Phase**

Empathise phase refers to the part where designers are trying to empathise with the users and understand the problems. This involves exploring the problem area as well as using various methods to gain a deeper understanding of users' experiences and motivations.

2. **Define Phase**

This phase refers to the point where designers already have collected information of the problem area and the users' experiences. In this phase designers often analyse, define and scope out the problem in order to be able to define a problem statement.

3. **Ideation Phase**

During the third phase designers will generate new ideas emerging from the collected data.

4. **Prototyping Phase**

As of the prototyping phase, which is the fourth stage in design thinking process, the designers' goal is to produce a number of low-fidelity and high-fidelity prototypes of the product or specific features within the product. This is an experimental phase in which the purpose is to come up with the potential best solution of the problem statement.

5. Testing Phase

Lastly, in the testing phase, the designers use the prototypes finalized in the previous stage for usability testing. The purpose is to test the prototypes and to identify the best solution for these particular problems. Although this is the final stage, this iterative design process usually does not finish after the testing phase. Instead the results are often used to redefine one or more problems, hence going back to the first stage [52].

This study will follow the design thinking approach, as it is essential to understand the collaborative playlist users in order to improve their co-experience when collaborating. The process of this study will therefore be highly influenced by the design thinking methodology.

3.2.2 User-centred Design with Laboratory Studies

User-centred design, *UCD* in short, is also an iterative design process. The focus of the UCD process lies within the users. This means that the users will influence the design by being highly involved during the entire design process in order to ensure that a usable and user-friendly as well as accessible product is created [7]. With that said, users will be included throughout the design process of this study, by involving them in a user study aimed to understand their needs, and in a testing session to identify how well the new design is received. These two sessions will be done through laboratory studies conducted with the think-aloud observation, followed by a semi-structured post-study interview.

Think-aloud protocol is an observation method conducted in a controlled environment in which the participants articulate their thoughts while interacting with the design. The communication will reveal the participant's behaviours, emotions, opinions and impressions that otherwise might be difficult to catch [46, 37]. There are two common ways to conduct the think-aloud method, either concurrently or retrospectively. The former version refers to letting the participant communicate while interacting, whereas the latter indicates having the participant complete their tasks in silence, and describe their thoughts afterwards [37].

As observations are more focused on what is happening, interviews can reveal the underlying reason why it is happening [46]. Interviews can be either structured, unstructured or semi-structured. Unstructured interviews consist of open questions where the answers many times are unpredictable. Rogers et al. [46] describe the advantages of open questions as generating deep understanding of the topics and catching aspects that the interviewers may not have reflect upon. Although there are many positive aspects of open questions, the authors argue that they are time consuming to analyse due to the amount of unstructured data retrieved, and the diverse findings between different participants. Structured interviews, on the other hand, will contain a set of predetermined closed questions that are clear and concise and in which the answers can vary between a few known alternatives. The advantage of closed questions is that data can be answered and collected fast. Lastly, semi-

structured interviews are a mix of the two types, containing both open and closed questions [46].

Data from the interviews might be biased, for instance due to the interviewer's way of speaking or acting that influences the participant in a certain way [37, 46, 29]. It is also important to not confuse the participant and make sure not to expect too much of an expertise in giving feedback [29].

3.2.3 Mobile Design Patterns

As this thesis is focused on designing for mobile devices, guidelines for mobile design have to be taken into consideration. There are certain challenges when designing for mobile devices, compared to when designing for desktops. For instance, mobile devices have smaller screen sizes, which makes it difficult displaying much content [13]. For that reason, sidebars, long header menus, big images and other big graphical elements need to be avoided. The layout must be stripped down to its core as much as possible [53]. There is also a variety of operating systems and platforms [13], as well as different screen sizes, making for many factors to keep in mind when designing for mobile devices [53].

Other challenges on mobile screens include small touch targets and difficulties typing. In fact, mobile phones are often used in different physical environments, where they are interacted with something or someone else. This means that the user will have limited attention toward the task. On the other hand, while being on the go, the user will probably not need the same range of needs on the phone, as on a desktop. This means that stripping down the content and features might not be such a big of a problem. There are also many mobile features to take advantage of when designing for a smartphone. For instance, the abilities to receive gestural inputs and give haptic feedback [53].

3.3 Wicked Problems

According to Buchanan [19] was the wicked problem approach created by Horst Ritell who described the phenomenon as a "*[...] class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing.*". A wicked problem is akin to the design situation this thesis will be confronted with since it will tackle undefined problems, ambiguous information and could be seen as a symptom of another higher level problem. The design solution for collaborative playlists is neither obvious, nor an easy task to solve.

Buchanan [19] claims that the subject matter of design is universal since design thinking can be applied to any area of human experience and it is up to the designers to conceive. Gaver [23] claims that there are a few different ways of how research through design can be conducted. The traditional way is by developing it through

agreement and elaboration. Yet, Gaver states that it can also be developed on top of other's solutions or simply subverted where designers could suggest new alternatives. The iterative work in the thesis with working on the design of a collaborative playlist can be seen as the kind of manifesto Gaver describes. It will on one hand be developed based on other's previous work through the literature study as well as from elaboration and agreement through user studies and testing.

4

Industrial Use Case

The use case of this Master's thesis will be examined in collaboration with Spotify AB, an international and digital media service provider that was established in Sweden in 2008. Spotify has over 250 million active users and thus is becoming one of the leading companies in audio subscription service industry. Its service is available in both desktop and mobile format, with mobile as the dominating platform [48].

One of the features of Spotify's streaming service is the collaborative playlists. The goal of this collaborative playlist feature is to allow its users to share playlists with others to collaborate in creation and modification of playlist [49]. It is not until the user has created a playlist that the option to make it collaborative is available in a context menu connected to the playlist. The feature provides a shareable link to the playlist that the user needs to manually send to another Spotify user through other social network platforms, and each person that receives the link will have full access to the playlist, such as adding and removing songs.

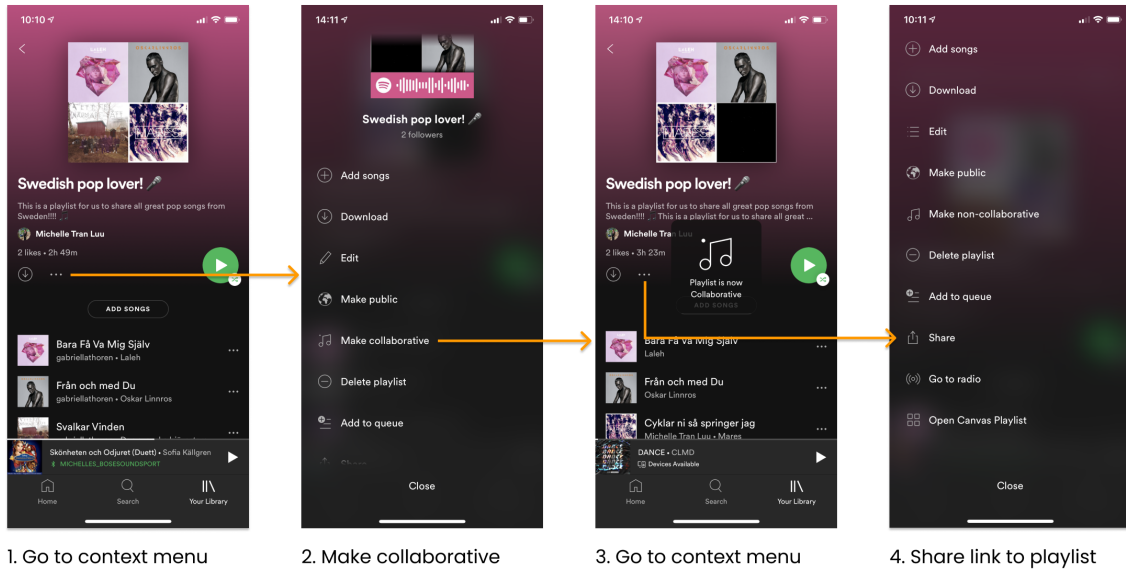


Figure 4.1: Process of creating a collaborative playlist in Spotify's current iOS version

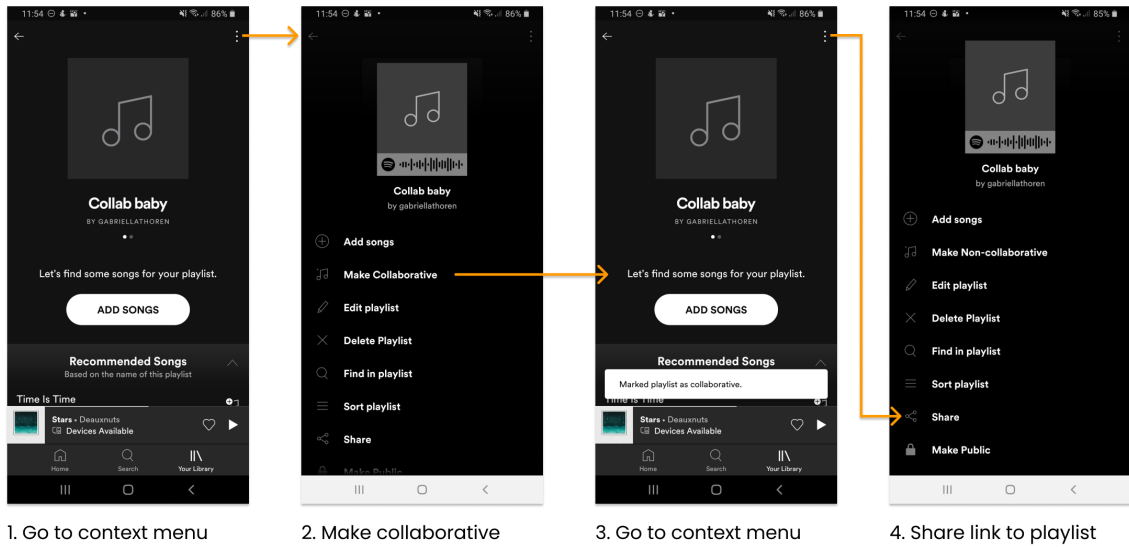


Figure 4.2: Process of creating a collaborative playlist in Spotify's current Android version

One of the teams working on the development of Spotify, *Core Experience*, has identified a couple of potential problems with the collaborative playlists, both based on their experience with the product development and small-scale tests. They have found that the feature may be difficult to discover and understand. One issue is that the sharing function is lacking user control. Considering that the access link can be distributed unrestrained and, whoever has the link can gain full access to the playlist. Another issue is caused by the difficulties recognising what changes have been made in the playlist and who was responsible for them. In addition to this, there is little indication that a playlist currently is collaborative. Due to the trend of digital sharing, we see potential in this function and consequently want to enhance the user experience it offers and its ease of use.

Additionally, we see a demand for the collaborative playlist feature on Spotify's community page [3]. Spotify maintains a community page that allows users to share ideas, find solutions and to discuss music. This community has over 7 million users and 30 000 shared ideas. These ideas are evaluated and voted for by other members and usually the top voted will be later implemented by Spotify. An example of social listening ideas are *"Real Time Listen with Friends"* [9], where a user would like to be able to listen to music simultaneously with friends. Another idea is called *"Friendship playlists - an auto-generated collaborative playlists"* [11] that help friends to automatically create collaborative playlists based on all their music tastes. A third example is the *"Owner controls Collaborative Playlists"* [8], where a user would like to have special privileges for the owner of the playlist and *"Collaborative playlist comments"* [10]. All these examples do not only show the demand for the collaborative playlist feature, but also the potential of developing it further.

5

Methodology

The design thinking process described in section 3.2.1 is closely aligned with the study by Rogers et al. [46]. They argue that there are four main activities important to create valuable designs. Those activities consist of establishing design requirements based on user research, designing alternatives that fulfil those requirements, creating interactive prototypes of the design and, lastly, evaluating the prototype to determine its usability and user experience. They also emphasize the importance of involving potential users throughout the process to understand their needs and create valuable designs. We have followed these suggestions, by creating a design process of six phases: *data inquiry phase*, *problem analysis phase*, *ideation phase*, *prototyping phase*, *testing phase* and *summative analysis phase*.

With these stages in mind, several methods have been carefully selected with the help of our supervisor at Chalmers, and a senior user researcher at Spotify. The methods are diverse in order to support methodological triangulation, where different research techniques are used to increase the validity of the results [46]. In this section, each phase and method will be described in detail and our choices will be reflected upon. To get a better overview of the time plan guiding the thesis, see Appendix A.

5.1 Data Inquiry Phase

To understand the problem space better, the first phase in our design process consisted of collecting data. This was done through Spotify’s data logs and by conducting a laboratory study with think-aloud protocol and post-study interviews.

5.1.1 Data Logs

Data logs is a technique to capture and collect information about exact user interaction in a system and, thus, are a great source for identifying patterns in user behaviours [46]. For that reason, we decided to gather data from Spotify’s data logs. Compared to, for instance, interviews in which answers might not correspond to reality, data logs can work as a complement by providing quantitative data

describing user behaviours. For that reason, existing data about the current usage of Spotify’s collaborative playlist feature was collected and analysed. The data gathered gave insights into the frequency in which the feature is used and the most common platform users collaborate on.

To get answers to the data gathering related questions, SQL queries were formulated and executed against the data sets. Nevertheless, the data collected from the data logs provided us knowledge about users’ behaviours. It lacked insights of why the users were behaving in a certain way. For that reason, the method was complemented with a laboratory study.

5.1.2 Laboratory Study

To understand user needs, a laboratory study was conducted with twelve potential users of a collaborative playlist. The goal of the study was to answer at least part of our research question, which is: *What UX design factors in terms of affordances and user’s perception of control should be considered when designing mobile collaborative playlists?*. To get more details about the setup, see Appendix B for the study protocol.

Each participant had a 30 to 60 minutes session which was initialised by the participant being interviewed. The purpose of the interview was to generate a deeper understanding of the user and to understand their social music experiences and desires. The interviews were structured by first asking the participant simple demographic questions. It then continued with questions related to sharing music with others followed by questions toward collaborative playlists. The interviews were conducted in a semi-structured format, meaning that it had both unstructured and structured parts, with a mix of open and closed questions. As open and closed questions have its benefits and drawbacks, we believed it was important to have a mixture of both to prevent from missing important insights. The open questions were aimed to be more exploratory and, thus, may discover new perspectives that we, as researchers, might not have thought about. The closed questions, on the other hand, were meant to ensure that our important questions were answered by every participant. The interviews strove to eliminate biases by avoiding leading questions or attitudes of the researcher.

After the interview, a formative evaluation of the current collaborative playlist feature was conducted. A formative evaluation can be described as an approach to test a design against users’ needs in order to find the issues and potentials of a design. The insights from such an evaluation can be used as the foundation of a new and improved design [46, 41]. This evaluation was formed by having users test the feature while being observed with the underlying aim to identify any issues around the affordance and perception of control of the current collaborative playlist feature. To identify these, the participant was given two different scenarios including a couple of tasks to complete in the Spotify mobile application. The scenarios were meant to give the participant something to relate to, instead of just

having a list of tasks to complete without a context. The task was meant to control if the participant were able to easily complete them by finding the relevant options in the application and how they felt when several users had control over the same playlist. After each scenario, with their sets of tasks, the participant was asked a couple of questions about how they experienced the process and what they thought could be refined. The questions were decided to take place after each scenario, instead of at the end of the observation, to support the recall of what they thought and felt. The observation was also conducted in terms of the think-aloud protocol by having the participants communicate while interacting. The participant was encouraged to articulate their thoughts, opinions and emotions while interacting with the design in order to capture the initial and spontaneous reactions of the participant.

The order of the laboratory study and whether to start with the observation or the interviews was discussed in great detail. It was essential that the observation would not be biased by the interview and vice versa. As the observation focus on collaborative playlists, the risk of it affecting the participants' answers in the interviews was too high, and was therefore placed at the end of the session. If the interviews would begin, the thought of collaborative playlists would have been planted in the participants' heads and they might relate their answers to such playlists, which they may not have done otherwise. It was important that they talk freely about what they do without forcing them to think about collaborative playlists. By doing this, it was ensured that if the user talks about collaborative playlists, it is because they are actually aware and uses the feature, and not because it had been brought up. For the same reason, it was decided to mention the goal of the study as little as possible and instead speak about it in more general terms.

As this study partly focuses on affordance of the collaborative playlist, one of the things to investigate was the naming of the feature and if users understood what "collaborative playlist" meant. A decision was therefore made to not refer to the function as "collaborative playlist" and instead let the participant use their own term for it. The participant would not come in contact with the term until they were creating their own collaborative playlist during the observation. By having this approach, it was possible to identify if the participant found the right option in the application without assistance.

Additionally, it was considered if the session should be held in Swedish or in English, as most of the participants would be Swedish. Some Swedes may feel uncomfortable not speaking their native language and having problems expressing their thoughts and feelings in English as it can be too difficult, or they are expressing themselves with the wrong words, resulting in missing important information or misunderstanding what they are describing. On the other hand, translating the insights from Swedish to English in this report might not give the real picture of what is being said as expressions might be difficult to translate. It was decided to take this risk, by having the participant decide which language to

speak. It was more important that the participant was comfortable and could easily express themselves as it may be an already uncomfortable situation. This decision could have meant that some of the sessions would be held in English, while others in Swedish. That might also have been problematic, as all interviews would not be expressed in the exact same way and the result might have been more complicate to compare as they might not be expressed in the same way. At the end, all participant wanted to have the session in Swedish.

Another discussion that came up was if the sessions should be conducted with a formal or non-formal language. Having a formal language might make the session a bit stiff and boring, and may be more difficult to listen to as a participant, as well as difficult to understand, in contrast to informal language. At the same time, informal language might look unprofessional and not very serious. It was decided to go with the latter, to make sure that the session would be interesting and fun, and easily understood.

At the end of the session a debriefing part was added to thank the participant for their participation, but also to tell them a bit more about the study without the risk of affecting their responses. The reason behind including this part was to potentially get more information from the participant if possible. If they felt as the session was about to end, they might not feel the pressure from the observation session anymore and maybe open up some more.

Participants

The laboratory studies were planned to be conducted with two user groups, including four participants between 18 and 55 years old in each group. One group was planned to consist of non-Spotify users given that they are not familiar with the user interface and would not be able to guess their way through the user flow. The purpose of this group was to identify potential design problems. The second user group was planned to consist of Spotify users. This group would be divided into two subgroups, one with collaborative playlist users, and one without. The reason of having these two subgroups was to better understand how and why some are using the feature, as well as to understand why others have not been interested in using the feature.

To recruit these participants, a recruiting firm in Gothenburg was used and each participant was paid with a remuneration. In the end the participants' profiles was not exactly the same as planned, instead they looked as follows:

- 3 non-Spotify users.
- 7 Spotify users that had not used the collaborative playlist feature.
- 2 Spotify users that claimed that they had used the collaborative playlist feature, but one only used the feature by collaborating with himself from different accounts, and had not used it with others.

Reviewing the Study Protocol

To ensure that the laboratory study was clear enough for the participants to understand, and would result in reliable and high quality data, three pilot studies were conducted. The three participants were acquaintances, but that was not very familiar with our project.

1. Pilot Participant 1

Spotify user that had used the collaborative playlist feature.

2. Pilot Participant 2

This participant was a Spotify user that said she never used the collaborative playlist feature before, though it turned out she had used the feature once, but did not really contribute to the list and was not familiar with the feature.

3. Pilot Participant 3

The last participant was a new Spotify user that registered four weeks earlier, but had barely used the function.

The three pilot studies generated a lot of insights, and the protocol was refined based on the sessions. New questions arose, while some existing ones had to be clarified and others be removed as they were repetitive. The pilot study with the new Spotify user was the most valuable one, as it became clear that some of the tasks were too difficult to complete without help. As a result of this, some reassuring information was added, where it was clarified that the participants should not feel pressured to complete the tasks, and that the focus was on what they were thinking and feeling. The questions after each scenario were also improved, as they were too general, and they often forgot the problems they had in the beginning of the scenario. The questions were updated by specifically asking the participants how they experienced each step in the process for them to easier remember what they had done.

Besides the pilot studies, the laboratory study protocol was reviewed twice with our academic supervisor and twice with several designers at Spotify. Based on their expertise and experience as designers, they gave us a lot of valuable feedback of what could be improved.

Setting and Equipment

The session took place in one of Spotify's meeting rooms in Gothenburg. The room was prepared by removing all potential distractions, for instance, by turning off the TV, removing things from the tables and whiteboards etc. The room was also set up with a laptop, facing the participant, to record their reactions. When the participant had signed a non-disclosure agreement including the study consent form, and accepted to be filmed, the recording of the computer was turned on and the screen was darkened for them to not think too much about them being recorded. To ensure that no session was lost in case of recording mistakes, an additional phone was placed in the room capturing the audio from the session as well. Also, the actions on the smartphone during the observation had to be captured. To solve

this, a Ziggy camera was used, which faced the phone that lied on the table in front of the participant. To facilitate for the transcription process, both the computer camera and the Ziggy camera was connected to the communication software *Google Meet* [25] and recorded through there. With this approach it was possible to capture both the camera facing the participant and the one facing the phone, whilst having them all in the same video.

To perform the task on a smartphone, each participant was offered to choose between using an Android phone or an iPhone. When planning for the laboratory study a lot of discussions took place regarding if the participant also should have the option to use their own phone. By having the participant use their own device the study might have been easier to finish as it simplifies for them to navigate on a phone they are familiar with. Phone problems due to the participant not being used to the device may be disturbing and cause negative results when interacting with the design. Unfortunately, the structure of the observation made it too complicated to have the participant use their private phones as links to specific playlists had to be accessible for the participant. The decision was therefore made to only let the participant use Spotify's test phones to facilitate the playlist sharing process, even if it might be more difficult for the participant to navigate.

5.2 Problem Analysis Phase

The second phase in the design process was to analyse the data collected during the data inquiry phase. As the data collected consisted of a combination of quantitative and qualitative data, different approaches were taken depending on each data type.

5.2.1 Descriptive Statistics

For the quantitative data collected from Spotify's user data, averages and percentage were used to identify patterns in user behaviours. Rogers et al. [46] argues that it is beneficial to summarise data collections in more generalised numbers like this as the data becomes standardised and can be compared against one another. Besides statistics, the data were also visualised through graphs and diagrams to easier find patterns, as well as to find the outliers that deviated from the general patterns. Based on the statistics we made some conclusions about the usage of the current collaborative playlist feature.

5.2.2 Thematic Analysis

For the qualitative data collected through the observations and interviews, *thematic analysis* was used to extract meaningful insights within the data. This is a method where themes and behaviours are examined and identified from the data collection, providing a better overview along with a comprehensible conclusion of the data [36]. Rosala [47] describes thematic analysis as a visual method by physically or digitally organising and reorganising the transcriptions and code. She also describes it as

a method that works well when collaborating, as designers can discuss and create themes together.

Our goal was to go one step further from the so called *semantic themes*, where conclusions are drawn from what participants are explicitly saying. For this reason, we wanted to analyse the underlying ideas, assumptions and conceptualisations, to find the *latent themes* [18]. The following steps was inspired by Braun and Clark's [18] vision of thematic analysis, however we modified them a little to make it a more iterative approach.

1. **Get acquainted with the data**

The process was initialised by us reading through the same three of the twelve transcripts to create an overview of the collected data.

2. **Coding data**

The next step was to start organising the data collections to understand the meaning of the data. Each of the coders, in this case us, created a preliminary "code book" containing a collection for the preliminary assigned codes based on the first three transcripts from the last step. According to Maguire and Delahunt [36], there are two ways of dividing the data into groups. One way is to have a predefined set of groups, and the other it to let the data define the groups retrospectively. Since we believed the latter is a more intuitive way, we aimed for defining the groups retrospectively. To make this step effortless we used the free qualitative research software *Taguette* [51]. We coded the three transcripts individually by having relevant citations and reactions from the study marked and placed into relevant codes. This formed the first two code books.

3. **Review code books**

When the first individual code books were created, we compared them against each other and together agreed on a set of codes in which consequently resulted in a new and redefined code book. When reviewing the codes, we ensured that they were relevant, made sense and were clearly divided with one distinct purpose, as well as identified potential sub-themes.

4. **Coding the remaining data**

Once again, we worked independently with the rest of the nine transcripts and coded them based on the common code book created during the last step. When codes were missing, they were updated or new codes were created.

5. **Define themes**

After having individually coded the rest of the transcripts, we compared the codes once again, and discussed the ones that we have not agreed on. The discussions resulted in a joint code book that both of us had agreed upon.

6. Final data set

In the last stage we summarised and refined the final data set.

5.3 Ideation Phase

The ideation phase aimed to form new ideas and consisted of three ideation methods. The first two were conducted by the two of us, and the third involved external parties. For the former, Crazy 8 and Skewing had been chosen. The third and last method was a complementary workshop that was conducted with Spotify employees.

5.3.1 Crazy 8

An extended version of Crazy 8 was used to visualise new ideas on paper. A Crazy 8 session is traditionally conducted by each participant having a piece of paper folded into eight rectangles. For every rectangle, one minute will be spent to sketch a simple idea. When eight minutes have passed, each participant should have formed eight new ideas [24, 20]. We kept the core of the method when ideating. Albeit instead of limiting ourselves with only eight ideas in eight minutes we did not have a time limit, nor a limit of number of ideas. Instead, each of us sketched down a few ideas based on every high level theme that emerged from the coding. The reason for us doing this separately was to not bias each other's ideas prior our joint discussion on the solutions. When each of us had sketched on how we imagined the future collaborative playlist feature, the ideas were compared and discussed.

5.3.2 Co-design Workshop

Besides conducting an ideation session with ourselves, we believed there was a benefit to conduct a workshop with employees at Spotify in order to further discuss collaborative playlists and to generate new potential ideas. The rationale was that the employees have presumably more expertise in the area of audio streaming services as well as social listening. Thus, their insights would be valuable for the creation of the design. Consequently, an invitation was sent to all employees at the Spotify office in Gothenburg and the ones that wanted to participate could enrol. Eleven participants ended up participating, all having diverse roles at Spotify. Three participants were product designers, two product managers, a Head of curation strategy manager and the rest were engineers and developers.

We decided to have the workshop after the ideation with Crazy 8. By doing it in this order, the workshop discussions enhanced our design solutions with additional ideas rather than affect us with biases from the discussion. Additionally, workshops are claimed to be beneficial in bringing new ideas as innovation often increases when ideating within a group and group discussion tend to decrease the risk of looking back on old patterns [14]. In contrast to ideating individually, we hoped that a collaborative ideation would result in collectively built ideas.

Due to the COVID-19 outbreak the workshop needed to be hold remotely, instead of holding it on the premises. This did not cause too much change to the original structure of the workshop. For this reason, the video meeting application Google Meet [25] was utilized for the workshop. The structure of the workshop consisted of three parts. The first part focused on what our study was about, a short description about collaborative playlists as well as information how they are used today according to statistics. We also went through some key findings from the data inquiry phase. The reason for having this first part of the workshop was to have all participants on the same page and to have them focused on solving the problems with the feature. The second part relates to having the participants ideate themselves and the third part refers to the group discussions revolving around the ideas.

To have the participants focused and engaged on what was presented, as well as capturing the areas they found most interesting, we encouraged the participants to take so called "How Might We" notes. On these types of notes the participant can write down a problem they find important to solve, but instead of seeing the problem, the note turns it to a more positive way of thinking by asking "how might we fix the problem?". It turns the problem to a possibility and keeps participants positive instead of only focusing on a problem that has to be fixed [57]. For instance, one example from the session was the "How might we provide more control over the permissions for collaborators?". When the first part of the presentation was finished, each participant got to pick one or two notes they found most interesting and present it to the group. This gave us insights in which parts of the findings they felt most important to focus on.

In the second part of the workshop all participants were divided into two different groups. They were either placed in the *Affordance* group or the *Perception of control* group. Each participant was asked to sketch individually on solutions of the problems connected to their group for 30 minutes. The Affordance group focused on how well the collaborative playlist feature was understood by the user, and the design problems they had to focus on was the creation of a collaborative playlist, the process of inviting collaborators and the process of getting invited to a collaborative playlist. The Perception of control group instead focused on how the collaborative playlist user could feel as they have enough control over the playlist. Their design focus was on what permissions the creator and collaborators should have in the playlist, how the permission should be visible in the user interface and how to provide feedback on user actions.

The reason behind the workshop participants being split up into two groups was that there were a lot of findings and it would be too difficult for the participants to sketch on solutions for all the problems in a short amount of time. Instead we had them focus on parts of the problems. By sketching individually, we also prevented a few more extrovert people to bias the rest of the group and take over the session while others' ideas would have been stopped from arising. When 30 minutes had passed, each sketch was presented and discussed with the group in order to capture the different takes on each idea and potentially form new ones.

5.3.3 Skewing

Due to the fact that this thesis is looking at an already existing feature, the ideation method *Skewing* was selected to generate design refinements and come up with new ideas. Skewing is conducted by looking at the design's existing interaction properties and changing them in different ways, resulting in new design ideas [34]. Design refinements through Skewing can be conducted in different ways, however we conducted it by skewing several properties at a time and evaluated how the design changed. To find the properties to change, we decided to partially use a framework for designing mobile experience for collocated interaction written by Lundgren et al. [33]. This framework was appropriate for the thesis as we were aiming for mobile platforms and mobile collaborations. Although the framework is mainly focused on collocated interaction, and the collaborative playlist feature is not collocated in a physical sense, they still share some similarities. They both are dependent on collaboration, and therefore the framework will be well suited for this research. This framework consists of four perspectives meant to help designers reflect on the design from different points of view:

1. **Social Perspective**

Design properties related to the social features of the design.

2. **Technological Perspective**

Design properties related to the hardware and software.

3. **Spatial Perspective**

Design properties related to location and physical space.

4. **Temporal Perspective**

Design properties related to the temporal experience of users, the synchronisation and pacing of user activity.

Each property consists of different states, as can be seen in the descriptive figure 5.1 below. By modifying the states, there will be nuances in the design [33].

	PROPERTY	STATES	DESCRIPTION
SOCIAL	FOCUS	<i>collaboration communication competition combined</i>	What it is that users do together, i.e., what is the focus of their social actions intended to be.
	COORDINATION OF ACTION	<i>timing actions combining actions combined</i>	Whether, and if so, how actors perform coordinate actions together.
	FRAMING	<i>public private combined</i>	The main social situation in which the activities are carried out.
TECHNOLOGICAL	INFORMATION SYMMETRY	<i>symmetrical asymmetrical</i>	Whether all users have access to <i>the same</i> information or not.
	INTERACTION ABILITIES	<i>symmetrical asymmetrical</i>	Whether different users have different abilities/possibilities to interact with or in the system.
	INFORMATION DISTRIBUTION	<i>free unfolding limited shared combined</i>	The ways in which information is being distributed to users and spectators.
	EVENT TRIGGERS	<i>information-based time-based proximity-based combined</i>	What users or the system need to do in order to trigger an event that may change or cause progress in the system.
SPATIAL	PROXIMITY	<i>people devices objects locations combined</i>	The ways in which proximity is used as a mechanic, including the entities and relations for which proximity matters.
	LOCATION(S)	<i>One or more none</i>	One or more specific location(s) or place(s) that matter for the experience.
	MOVEMENT	<i>on the go sedentary combined</i>	Whether users move through space as part of the experience.
TEMPORA	SYNCHRONISATION	<i>user-driven system-driven combined</i>	The ways in which actions within a temporal frame are synchronised.
	ENGAGEMENT	<i>continuous intermittent sporadic</i>	Users' temporal patterns of action within the experience.
	PACING	<i>high-paced slow user-paced combined</i>	How the intensity of action is distributed across the experience, e.g. number of actions per time-frame.

Figure 5.1: Framework for designing mobile experiences for collocated interaction [33]

As can be seen, skewing promotes designers to think outside the box and to be more innovative when designing, instead of getting stuck to old ideas and patterns. This was the main goal when choosing this method.

5.3.4 Idea Selection

To choose the ideas we wanted to proceed with, we collected all ideas created during the individual ideation, the workshop and the ones created through Skewing. Each and every one of the ideas was discussed in terms of how well they fulfilled the goal of improving the affordance and perception of control of the collaborative playlist feature. The ideas fulfilling these two goals the most were selected to be further developed.

5.4 Prototyping Phase

In the prototyping phase, the design ideas from the ideation stage were further developed, first as a low fidelity prototype, then as a more detailed high fidelity prototype.

5.4.1 Paper Prototypes

To begin the prototyping phase, simple paper prototypes were created based on the ideas selected during the ideation phase. The ideas were sketched on paper in order to visualise them and to better understand what works and what had to be changed. By getting the ideas down on paper, some parts of the design were updated as it was easier noticing flaws in the design ideas once they were visualised. It also helped us summarize all ideas from the ideation phase, and see which ideas could be combined and which should be excluded.

This phase resulted in each view for a new collaborative playlist feature to be sketched. Photos of each view were taken and uploaded to Figma, where a flow of the whole collaborative playlist experience was created. The flow gave us a better understanding of how well the design would work as a whole and made it clear if essential parts were missing in the design.

5.4.2 Heuristic Evaluation

The last method used in the prototyping phase was another formative evaluation method meant to test how well the paper prototypes worked. This was done with *heuristic evaluation* which is a method where preferably three to five experts evaluate how well designs are fulfilling known usability principles (heuristics). These heuristics may include how well informed users are by the system, whether or not the interface can be understood and used, how much control and freedom the user has, if the system is consistent and following design standards, how well errors are prevented and help conveyed and how the aesthetics fulfil the requirements [46]. According to Rogers et al. [46] typically 75% of all usability problems in the design can be found when conducting a heuristic evaluation. With that said, heuristic evaluations are a good approach to solve problems without spending too much time, and as a result the user testing can focus on the problems that might be difficult to predict.

We planned to conduct heuristic evaluation sessions with designers at Spotify as we believe that their design experience, as well as knowledge of Spotify branding design and their users, provides us with valuable insights to potential problems in our design solutions. The reason for using heuristic evaluation is based on our aim for a user-centred design. We believe that by combining users and experts, we can provide much better design prototypes based on, not only user evaluations, but also well-known design principles. In the end, we did not conduct one heuristic evaluation session, but three. The first session was held with our two supervisors at Spotify. We went through all our established ideas and the flow of the new feature. The supervisors gave us feedback while going through the flow. At the same time, they had a chance to vote for the most preferred design in a dot voting session where each one could place a dot on the ideas that they liked the most. This was meant to see which ideas worked the best and which were most interesting. Based on the discussions and dot voting, the paper prototypes were refined.

Afterwards, the prototype was refined based on the feedback from our supervisors. A second heuristic evaluation was conducted on the updated prototype with our supervisors again and two additional designers. Once again, we went through the functionality of the new feature and the flow. We received feedback from the designers and the prototype was updated based on their insights. Finally, a third heuristic evaluation session was conducted with one of the design teams at Spotify. There were 25 designers attending the session, and a lot of valuable feedback was received about the design. When the last heuristic evaluation had been conducted, the paper prototype was updated one last time.

5.4.3 Wireframing

When the paper prototype was finalized, *wireframing* was carried out. Wireframes are visual layouts representing the design in more detail than paper prototypes and are similar to the end product [37]. In our wireframes, we included the graphical elements and showed the interactions of the design to provide us with a better image on the visual part as well as the user flow. The wireframes followed Spotify's design guidelines to ensure that the design was consistent with the rest of the mobile application. The wireframes were, once again, walked through with our supervisors at Spotify to get feedback on potential flaws.

5.5 Testing Phase

The final design prototype was ultimately tested with potential users to reveal how well the new design performed in a so called summative evaluation session. Both the Nilson Norman Group [41] and Rogers et al. [46] describes summative evaluations as a good way to test the overall experience of a relatively finished product to find aspects that need to be upgraded. As we desired to evaluate how the new design was received by potential users, this was the approach that was followed. The testing was conducted using UserTesting [54], a platform for conducting remote interviews and tests with participants. Each participant had a 30 to 60 minutes session where the goal was to see if the design had improved the affordance, as well as the perception of control in the collaborative playlist design. As the design was not integrated into the current commercial service at this point, the final prototypes were shown as digital wireframes.

The testing session was set up with a number of demographic questions about the participants, followed by a think-aloud protocol observation, in a similar manner as for our laboratory study in the data inquiry phase. The initial questions regarding the participants background, smartphone usage and music service usage were asked to get an understanding of the participant as it may affect how the user is interacting with the prototype. As the interview part went on effortlessly, the main focus was on having the user testing the prototype.

In the same way as the previous user study, the observation was structured with two different scenarios, where each scenario included a couple tasks to complete (see the

protocol in Appendix D). As not all features in the new design could be tested due to the time limit in the session and to not overwhelm the participant, only essential parts of the design were tested. For this reason, the first scenario presented for the participant was focused on being invited to a collaborative playlist, while the second one was focused on creating a collaborative playlist. This approach is similar to the first user study as to allow us to compare the results when using the current design in contrast to the new one. The reason for structuring the scenarios in this order was that some people will only be invited to a collaborative playlist and never create one themselves, or they will be invited to a collaborative playlist before creating one. What this means is that they will not have seen the possible options for creating the playlist and therefore have a limited understanding of the playlist. They will just receive an invitation where everything has been prepared for them. It is therefore necessary to first evaluate how properly they understand the user interface for being invited to a playlist, prior to see what settings can be set for a collaborative playlist and have a more complete overview of the feature.

While the participant interacted with the prototype, the participant was prompted to describe what they were doing and why, whether the interface fulfilled their expectations and if they liked or disliked parts of the design. Follow-up questions were also asked throughout the process and after one or a few tasks, the user was stopped to answer questions about their experiences and thoughts so far. The reason for having this structure was based on the first user study where we realized that participants forget what they were thinking and feeling if they did not explain it right away. This time we tried to ask the questions immediately before they forgot.

Participants

The targeted user groups remained the same for the user testing as in the laboratory study, but with new participants. The aim was to have 12 participants equally divided in three different user groups with a mix of genders and ages between 18 to 55 years old. One group with non-Spotify users, one with Spotify users that have experienced the collaborative playlist feature, and one with Spotify users who have never experienced the collaborative playlist feature. This mix of users was assumed to help us identify how well the design was received and what flaws needed to be improved. It also helps us identifying whether non-collaborative playlist users were more willing to use the feature after the modifications, and if the current collaborative playlist users saw potential in the new design.

As we had experienced a recruiting process from the laboratory study, we decided to improve the recruiting requirements. This time we did not include participants that were not skilled smartphone users as we are not targeting that group. We also made the effort to exclude people that had a developer background as they might be too biased by their work, and not interact in the way that most users would. Another part that was clarified this time was that the participants within the non-Spotify user group should never had used Spotify before, as some without a Spotify account has used Spotify in the past or with someone else's account.

UserTesting [54] allowed us to recruit participants via the portal. To find relevant participants, a screening questionnaire (see Appendix C) had to be uploaded for users to answer and based on the responses, participants were automatically chosen for us and a session was scheduled. The screening questionnaire included questions about the demographics of the participant, their phone usage, their music service usage as well as their collaborative playlist usage. This gave us the possibility to filter out users that were not relevant for us, as well as capture the users from the three different target groups. We made the decision to have more questions than necessary, as we believed that participants who were willing to answer all questions might also indicate a bigger probability of them making an effort of completing the user tests.

Similarity as during the first study, the participants that we ended up with did not exactly match the criteria we had provided, even though this time it is more accurate. The participants had the following attributes:

- 5 non-Spotify users, however, one of the participants had a Spotify account in the past and another had tried Spotify but was not really familiar with the interface.
- 4 Spotify users that claimed that they had not used a collaborative playlist feature, however one of them had been invited to such a playlist but had not actively participated in the playlist and another one had heard about the feature.
- 3 Spotify users that had used the collaborative playlist feature.

There was a huge diversity of the participants that were recruited as they all had different backgrounds. For instance, all participants were located from all around the world, we had participants from India, Indonesia, Ireland, Malaysia, United Kingdom, Canada, Bosnia and Herzegovina, Belgium, USA and Mexico. All participants had much experience in using smartphones, and there was an equal division between the usage of Android and iPhone between the participants. All participants had different occupations and the ages of the participants varied a lot, all from 18 to 43 years old. Unfortunately, we did not have the possibility to recruit someone older than 43 years old.

Reviewing the Study Protocol

To be certain that the protocol covered the insights necessary and was clearly understood by others, it was examined by our academic supervisor, as well as a senior user researcher at Spotify. Based on their feedback, smaller changes were made. For the same reason, three pilot tests with one participant from each target group were conducted before the final user testing sessions. The three pilot sessions were a good way for us to try out the UserTesting platform and find potential complications when having the session remotely. It also made us realize that some questions had to be clarified, and some tasks had to change.

Setting and Equipment

Our initial plan was to conduct the session in person with each participant. Unfortunately, we had to change our plans due to the COVID-19 outbreak and have the sessions remotely instead. For that reason, the session was held via Zoom [6], a video conference software, hosted by the platform UserTesting [54]. Both us and the participants used the computer to communicate, and the web camera was on to make it more personal as well as to capture the participants' reactions while testing the design.

The original plan was to have the participant test the design through a smartphone to give them the feeling as they were interacting with a real app. As we saw several risks with sending the design to the participants' own phones, we decided that it was better for them to test the app on their desktop. It would otherwise have been too difficult to give the participants access to the design and additional problems would appear when having them film their actions on the phone as well as their reactions at the same time. For simplicity, the participant instead got access to the Figma prototype through a link that they could open via their web browser. While interacting with the prototype, the participant shared their screen with us so that we could see what they were doing. The interviews and interactions with the designs were recorded on video, for us to look through after the sessions.

5.6 Summative Analysis Phase

In the final phase of our design process, we analysed the results gathered during the testing phase. The data collected was analysed with the use of *Affinity Diagrams*. This method includes grouping the data gathered to better understand the underlying meaning of the data collection [37]. The Affinity Diagrams were initialised by us printing out the transcriptions of the sessions on paper and going through each one of them. When relevant data was found, they were physically cut out with scissors and placed together with all other data from the same task performed where they appeared. All relevant data was broken down to only contain one specific subject, sometimes it was only a sentence, sometimes a full paragraph, but most often it contained a couple sentences.

When all data sets had been cut out and placed in rough groups based on the tasks in which they had appeared, each group was analysed and divided into more relevant and specific groups. All data sets that contained similar data were placed in the same group, and the clusters that emerged visualized the overall themes from the user testing and gave an overview of the findings.

6

Results

In this section, the results of the design process will be presented. A detailed description of the insights from the data logs and laboratory study will commence this chapter followed by the refined design prototype created based on these quantitative and qualitative data findings. The conclusions from evaluating the prototype of the refined collaborative playlist will also be described. Based on the knowledge gained from the results, design factors and guidelines have been derived. These are intended to support designers of collaborative playlists in addressing user experience issues we have identified in this work.

6.1 Data Logs

By using the approach of gathering data from Spotify’s data logs and applying descriptive analysis to the findings, we found that the collaborative playlist feature is not being used to a great extent among users of music streaming apps nowadays. Many times, they are only listened to and updated by the creator of the playlist and should therefore not be qualified as collaborative playlists. For the collaborative playlists that are created, it turns out that many are not being listened to frequently and are seldomly updated. Most collaborative playlists are used on smartphones and they mostly consist of music, rather than other types of audio content.

As for the number of collaborators in a playlist, the most common number of collaborators is between two to three users. However, there are still a huge number of collaborative playlists with more than three collaborators. Some playlists have over a hundred of collaborators contributing to them.

6.2 Laboratory Study

By applying the method *Thematic Analysis* to the qualitative data collected from the laboratory studies, several themes of the findings could emerge. These findings were collected in a code book that can be viewed in Appendix E. The themes confirmed the results of the literature study of music being a social activity as people have a tendency to talk about music and create relationships around conversations about music. Every participant claimed that music plays a big role

during interactions with friends and family in social situations. For instance, music is consumed during a dinner party as a background involvement or when recommending songs to one's immediate circles. Even though music was considered a social activity, some participants still claimed that music can be a private experience at times and therefore they might not want to share their music collections with others.

When the participants were being asked if they would like to use collaborative playlists, the opinions differed. Some would like to use the feature, while others did not see a value in it. They all made it clear that a collaborative playlist feature is neither an essential feature, nor a priority. Yet a majority still saw a value in the feature. They pointed out the benefits of sharing a collaborative playlist together with a person of the same music taste, or with a person that knows what kind of music they like. Another preferred use case was to create a collaborative playlist for a specific purpose, for instance when throwing a party or going on a road trip. Another advantage of a collaborative playlist was to help each other discover new music or to create a greater music collection that might have been time consuming to do on your own. A risk mentioned was the collaborators' willingness to contribute to a playlist where passive collaborators can take advantage of other more active collaborators. As a matter of fact, some participants claimed that they did not mind that as long as their music was retained in the playlist whereas others felt it was tedious if they were the only ones making an effort. One participant even pointed this out as a great advantage, since she could listen to already prepared playlists without having to do much work.

As for the functionalities of the collaborative playlist, it was unquestionably that the participants wanted to have control over their playlists, especially if they were the creators. The majority of the study participants specifically stated the importance of restricting access to the playlist and being aware of the activities in it. For this, they expressed that it would make them feel more in control by being aware whom they are collaborating with as well as the recent activities in the playlist.

Participants had various views of what kind of access each collaborator should have in a collaborative playlist. Meanwhile, some participants wanted the ability to set different permissions for the collaborators in the playlist, the others thought everyone should have the same rights. In fact, some of these participants believed that once you agree on collaborating together you have also agreed on the terms to do it with equal rights. Several participants claimed that as the creator they only wanted the invited collaborators to be able to add songs but not remove songs from the playlist. In addition to this, some other participants believed that the invitees should only be able to suggest songs to be added to the playlist as they would not want others to make changes to the playlist. While this is true, there were some participants who did not mind collaborators to invite others to the playlist. Likewise, there were some other participants who would rather not grant the collaborators this possibility.

One shared attitude among the participants was the unwillingness to remove tracks that someone else had added to a playlist, especially if they were not the creator of the playlist. The same was expressed about situations when someone removed the songs they had added from a playlist. According to the participants, this was a disrespectful action as someone had made an effort to add the song to the playlist and it could cause conflicts. At the same time some participants claimed that they would not have wanted to listen to a playlist containing songs they do not enjoy, while others claimed that they could just skip that song or learn to like it. A solution several participants proposed, was to be able to remove a song for only themselves without affecting others.

When we asked the participants to create a collaborative playlist in the current mobile version, a majority of the participants struggled and only 4 out of 12 managed to complete the task without guidance. Two of these participants were the two only collaborative playlist users we managed to recruit, and the others were skilled Spotify users. To create a collaborative playlist in the current version of the music streaming app, the user is required to complete two independent steps by first marking the playlist as collaborative, followed by sharing the link to the playlist with the person to collaborate with. Many participants missed the part of having to make the playlist collaborative, and instead went directly to sharing the playlist link or trying to make the playlist public, believing that this was enough to start collaborating. Although some participants did press the “make collaborative” button, they did not understand what had been done nor what to do next. There are four underlying explanations for these misunderstandings that we have found:

- The option to “make collaborative” was difficult to understand and could easily be confused with the option to “make public” and “share”.
- When the option “make collaborative” is selected, the user is not provided any feedback indicating what has been done.
- There was no indication that the user had to complete the two individual tasks of making the playlist collaborative followed by inviting users.
- Inviting collaborators to a playlist was often associated as an alternative to sharing the playlist. As a matter of fact, a few participants navigated to the sharing view, believing that they could invite collaborators from there. For this reason, many participants naturally navigated to share the playlist link.

When we asked participants to invite a person to collaborate in the playlist, barely anyone had problems completing the task. Nevertheless, some confusion occurred when participants had sent the link to someone, as they could neither identify who had been invited, nor if the invitation was sent correctly. Additionally, several participants claimed that they would like the options to send invitations directly from the app or to send the link via other external social media apps as well as through text messages.

As for receiving an invitation to collaborate in a playlist, many participants had difficulties saving the playlist for further usage. In order to do so, the participant had to start following or like the playlist which depended on the operation system. Yet many participants did not connect the follow or like functionality with saving the playlist. For the ones that understood how to save the playlist, they most often forgot to do it before moving along in the interface resulting in them to lose the playlist. Only 3 out of 12 participants saved the playlist directly and instinctively, without receiving any hints. These three people were within the group of participants that also managed to create a collaborative playlist without guidance. Several participants indicated that they prefer to receive an invitation request to accept or decline rather than having to follow or like the playlist as that might make the action more understandable. In addition to this, a number of participants claimed that they would not want to be automatically added as a collaborator to a playlist, without first being clearly informed of it or having accepted the invitation.

6.3 Refined Design Prototype

Based on the findings collected from the data logs and the laboratory study, a prototype was created to improve the user experience of the collaborative playlist feature. Given that a clear interest in using collaborative playlists was identified in both the laboratory study and the literature study, we believe the dissonance between that fact and the low use rate of the collaborative playlists among the app users comes from users lacking awareness of the existence of the feature. Therefore, the main goal of the new design was to enhance the affordance of this feature. The aim also included simplifying the process of creating and using such a playlist, as well as providing users with additional control mechanisms. Another interesting aspect that was subtly considered in this prototype was to increase the social interactions in the collaborative playlist. This aspect was influenced by Batterbee's claims [15] of it being fundamental for creating a positive co-experience, but also from the discussions in the co-design workshop where there was an interest for this kind of features. The mere social integration that were implemented in the prototype, allowed collaborators to see what other collaborators are currently listening to. Unfortunately, the social aspect is beyond the scope of this study and could not be carried out in detail.

6.3.1 Design for Increasing Affordance

To enhance the awareness of the collaborative playlist feature among users, as well as to facilitate the process of creating one, the entry points to initialize a collaboration were updated. In our design prototypes, users can directly invite others to collaborate in the playlist as compared to requiring to making it collaborative. There are two approaches to do this, either by clicking the "add collaborator" button in the playlist view, or going to the "Share" option in the playlist's context menu. Both approaches lead to the same Share window where the user can share the playlist link. By allowing the button to invite people

directly in the playlist view and increasing its visibility, we believe that users will be more aware of the existence of the feature. Similarly, the assumption was made for merging the entry point for collaborative playlists with the share view. Being that many users already share their playlists and pay a visit to this view on a regular basis they will acknowledge the ability to send invitations with different levels of permission.

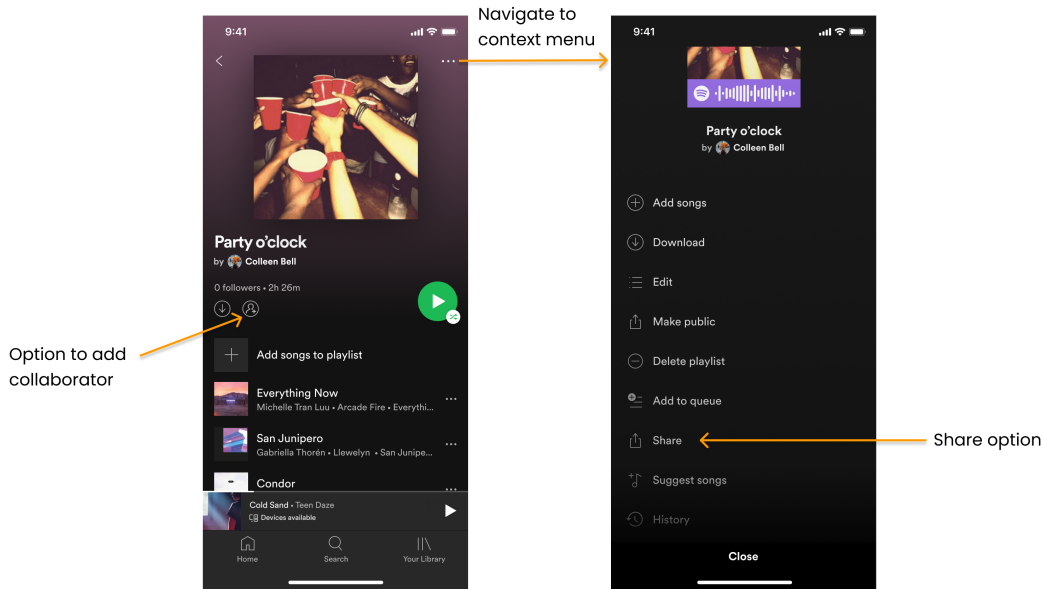


Figure 6.1: Options to start collaboration

While inviting others to collaborate, users have the option to send a link via other social media apps (as previously done), or by inviting specific users directly in the app. As a matter of fact, there are no longer any differences between creating a regular playlist and a collaborative playlist, as there is always the possibility to invite users to collaborate with different edit permissions. This design decision was made for two reasons: to simplify the creation and invitation process by removing superfluous steps that were difficult to understand, and to be consistent with corresponding sharing features of other services. Common collaboration services such as Google Drive [2], Figma [1] and OneDrive [4] allow the user to initialize a collaboration by selecting the option “Share” and from there specify the person to collaborate with and the level of access they should have. Since most participants in the laboratory study tried to share the playlist to make it collaborative, this aspect of the design is believed to correspond to this mental mapping.

Another change was made with the intention to increase the affordance when being invited to a collaborative playlist. This change consisted of having users receive an invitation within the app for them to accept or decline. All invitations are placed in a notification centre at the home view of the app. This newly proposed view, in the form of a notification centre aims to contain all invitation requests as well as other

relevant news. If the user accepts the invitation it will be saved to their library and they will have access to use the playlist with their assigned permissions.

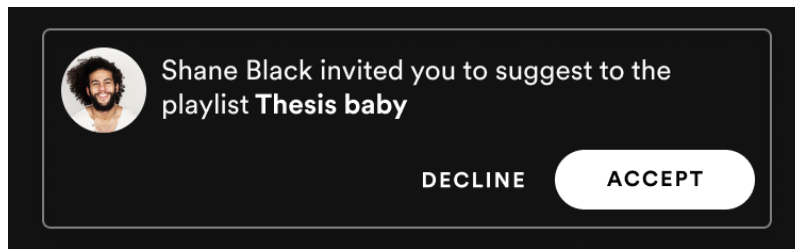


Figure 6.2: Invitation

Finally, another attempt to enhance the affordance was made with the focus on the feedback signals for the feature. When the user has made an action, feedback will be shown to confirm what has been done. If it is a bigger change, there will always be a possibility to undo their action.

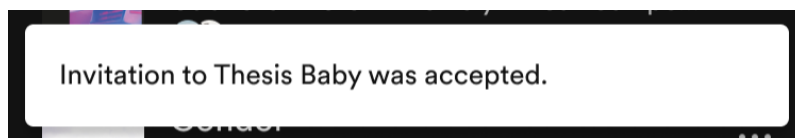


Figure 6.3: Feedback signal

6.3.2 Design for Supporting Perception of Control

To give the creator of the collaborative playlist more control over what can happen in the playlist, different levels of access can be assigned to the invited user. There are three different levels of permissions a collaborator can have in a playlist, either *can edit*, *can suggest*, or *can listen*.

- **Can edit**

Apart from being able to remove the playlist or the creator from the playlist, this collaborator basically has the same rights as the creator. They can edit the playlist in any way they prefer, they can suggest songs to the playlist, they can invite others to the playlist and they can listen to the playlist.

- **Can suggest**

If the creator or collaborator with edit rights does not want some collaborators to make changes in the playlist, and yet still desires recommendations of songs to add to the list, they can give them suggestion rights. These users can only suggest songs to be added to the playlist, as well as listen to it.

- **Can listen**

Without removing the current use case of sharing a playlist, the playlist can be shared by restricting the invited user to only have listening rights. This user is not called a collaborator and cannot do anything else in the playlist but listen to it.

For the creator and editors in the playlist to have more control and better overview over their playlist and what people can do in it, they have access to a list of all collaborators and can manage their permissions. The design decision was made to distinguish between collaborators and followers of a playlist, where collaborators is a user that has been invited to the playlist and has the option to contribute to it, while a follower is a user that only follows the playlist. When following a playlist, this playlist will be included in the user's library and it will contain the latest updates. A user can be both a collaborator and a follower, but a follower does not necessarily have to be a collaborator. For that reason, the two groups had to be divided, as well as to make it clear who has contributed to the playlist. Furthermore, a list of historic activities in the playlist can also be accessed. With this view, editors can be aware of what has happened in the playlist and have the ability to undo changes of their liking.

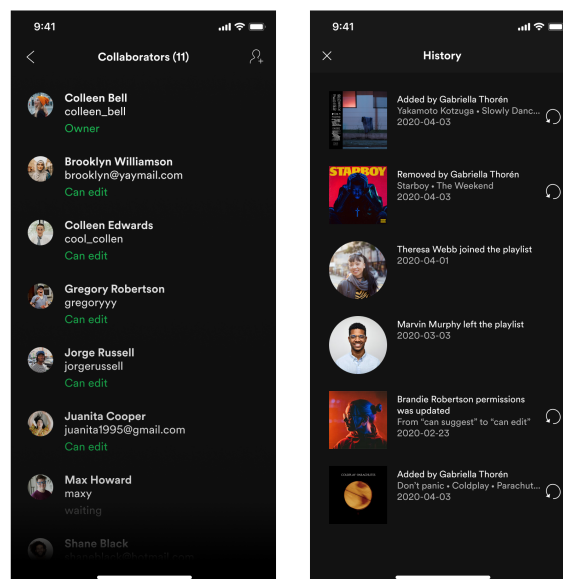


Figure 6.4: List of collaborators and playlist activities

Additionally, to let all collaborators in the playlist have control over what music they want to listen to, a “hide song” option was added to this feature. If a collaborator who is listening to the playlist dislikes a certain song and wants to remove it, they can hide the song for it not to be played to themselves, without affecting anyone else in the playlist. In other words, this will provide every listener of the playlist to have full control over what they listen to, without affecting others which could cause conflicts that many of the participants pointed out.

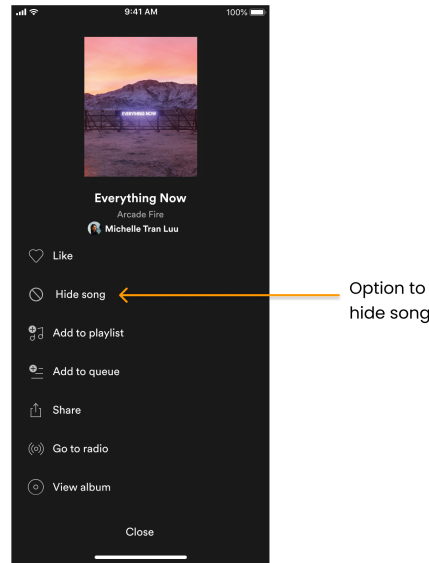


Figure 6.5: Context menu for song showing a hide alternative

6.3.3 Design for Supporting Social Interaction

Besides the changes attempting to improve the affordance and perception of control, the design prototype also included a minor social aspect. This social feature indicates which of the collaborators is currently online using the playlist and what song they are listening to at this very specific moment. This is visualized by showing the profile images of the current listeners and are embedded in the playlist view as well as in the Now Playing View. The reason for including this social feature is to enhance the feeling of solidarity in a collaborative playlist and with the hope that users can feel more connected to the other collaborators who are currently listening to the exact same song.

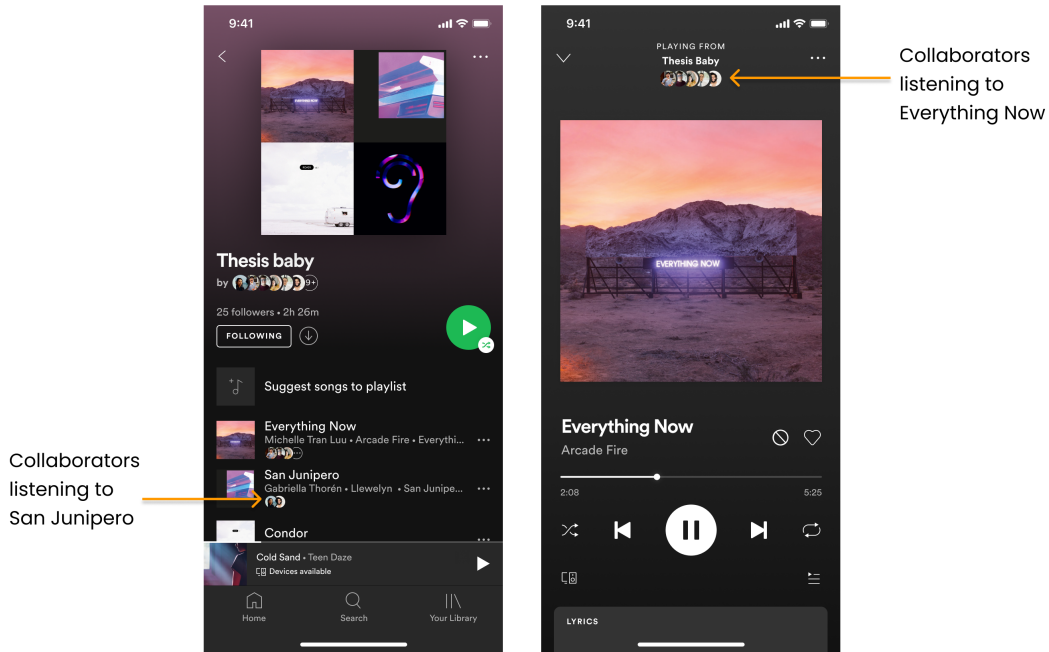


Figure 6.6: Collaborators listening to songs i playlist

6.4 Evaluation of the Refined Design Prototype

The testing session was initialized by giving the participant the task to accept an invitation to a collaborative playlist. During the evaluation of the existing design, only 4 out of 12 of the participants managed to save the playlist on the first try. However, when testing our refined design, all participants found the invitation quickly and managed to save it to their library without showing any signs of confusion. This was a major improvement from the laboratory study, and the participants stated that having the invitations at a centralized place for notifications was self-explanatory and easily accessible.

One flaw noted by several participants was the uncertainty of what actions could be taken in the playlist. When being asked what they believed they had access to do within the playlist, a majority of the participants showed not to have known of all available actions they could perform. Participants believed that they could make changes directly to the playlist, even though the invitation stated clearly that they had only been assigned a suggestion right. It was not until receiving the task to add songs to the playlist that a couple of participants realized that they could only suggest songs to the playlist, and not make direct changes to it. Even at this point, several participants misunderstood the reason why they only could suggest songs, and mistakenly believed that all invited collaborators had this limitation. Many participants kept this reasoning until they were finally asked to create their own collaborative playlists. At this point, they finally realized the option to give a collaborator a specific permission and they realised that they had been given a

suggestion permission earlier. Overall, half of the participants appreciated that they could only suggest songs, while others did not like this limitation.

Once the participants had received information about the three different levels of permissions, they expressed interest in using the functionality. They stated that by having these permissions they could have more control over their playlists. The suggestion permission was also a cherished feature when people understood that it was not an obligatory limitation for all collaborators rather that creators can grant different permission level. Many participants pointed out that it could especially be important in collaborative playlists created by a big group for the playlist to not get out of control. Nevertheless, an important finding to point out is that although participants liked the feature, it was not clearly understood what it meant to suggest a song. The participants were unsure what they should expect when suggesting songs and did not understand who needed to approve them. Another feature that was appreciated due to similar reasons as the suggesting permission, was the functionality to hide a song from oneself without affecting anyone else in the playlist. Several participants pointed out that this was a great way of customising the playlist after their liking without having to upset someone else when removing a song or feeling forced to listen to it.

Another confusion that occurred was that the roles of followers and collaborators could be seen as somewhat similar. When asking the participants to describe the meaning of the two, a majority pointed out that there were followers following the playlist and collaborators who contributed to the playlist, indicating that there is a difference between these. Yet, almost no one could confidently point out exactly what permission followers and collaborators have, and when a user is a follower or a contributor. The diffusion between followers and collaborators persisted in the question of asking participants to stop collaborating in a playlist. Almost everyone clicked the option to “stop following” instead of “stop collaborating” in the context menu and the participants were confused when they were prompted with a dialog asking them if they wanted to stop collaborating too.

Another feature that was evaluated was the *History* view. This view aims to help users have more insights and control of what has been happening in the playlist. Undoubtedly, this is not a feature the participants demanded the most and the opinions on whether this feature should exist varied among the participants. Only half of the participants managed to find history and some of them were looking for something else or simply could not complete the task as they did not understand such a feature existed. For those who managed to find the view, the majority of them understood the view and managed to retrieve a certain action.

The results from the user testing of the improved design prototype also showed that 7 out of 12 participants managed to create a collaborative playlist directly, all of which was from different all three user groups. Additionally 3 other participants also completed the task after having navigated around the interface a bit. This was a big improvement compared to the laboratory study where only 4 out of all 12

participants managed to create a collaborative playlist without guidance. For this use case, a majority of the participants immediately acknowledged and used the “add collaborators” button in the playlist view, indicating that the button is both prominent enough and well understood.

Last but not least, when the new feature of showing the current listeners of each song was tested, it was heavily misunderstood. Participants believed the face piles of profile images to be the collaborators who added the respective song to the playlist and they did not seem to care if this feature existed or not.

Overall, the results of the evaluation of the refined design prototype showed that the new design was an improvement over the original one, especially in being able to create a collaborative playlist, save the playlist and have the creator feel more in control of it. In contrast to the laboratory study, these participants also emphasized that they liked that the interface kept giving them feedback after each action and that it assured them that they were doing what they expected. Despite this, there are still a few areas that could be improved when it comes to the affordance of the features we proposed in the refined design prototype.

6.5 Design Factors

Several design factors have been identified as a result of this design process, which answers the research question.

What UX design factors in terms of affordances and user’s perception of control should be considered when designing mobile collaborative playlists?

These design factors have been formed based on the literature study as well as the laboratory study and user tests. They have been classified into two categories, one including design factors that focus on the perception of control, and one group about those influencing the affordance of the feature.

Perception of Control Factors

Control Factor #1. Control mechanisms for playlist creator

Control Factor #2. Balance in engagement

Control Factor #3. Visibility of the current state and evolution of the playlist

Control Factor #4. Preference of collaboration within one’s immediate circles

Control Factor #5. Customizability of the collaborative playlists

Control Factor #6. Mechanism for coordinating participation

Affordance Factors

Affordance Factor #1. Consistency with sharing mechanisms of similar services interfaces

Affordance Factor #2. Visibility of the collaborative playlist feature

Affordance Factor #3. Clarity of available controls and consequences of the actions

Affordance Factor #4. Multiple related user interactions in one connected flow

6.6 Design Guidelines

Based on the design factors presented, several guidelines have been established as the guidance to address the design factors and eventually create successful collaborative playlists. In this section, all guidelines are presented together with their respective design factor.

6.6.1 Guidelines for Perception of Control Factors

Control Factor #1. Control mechanisms for playlist creator

From the laboratory study and testing sessions, it was evident that users desired to have full control over their created collaborative playlists. A collaborative playlist feature must therefore increase the feeling of the creator being in control of their own playlist.

Guideline: Allow playlist creators full control over their playlists

As the laboratory study showed that there is a demand of having creators feel in full control over their own playlists, the control over the collaborative playlist feature should be placed in the hands of the creator. The creator should always have the final decision of what can occur in the playlist. Additionally, creators should have the possibility to grant editors the same ability as the creator oneself.

Guideline: Support levels of permissions for collaborators

During the laboratory study the participants had many different views of what collaborators should have access to do in a collaborative playlist. Several participants also claimed that they would like to set different permissions on invited collaborators in their playlists. The same problem could be found in the literature study where Yuill and Rogers [58] emphasised the risk of having too many users take non-restricted actions in the same interface. This assumption was integrated in the new design and was carried out for user testing. The response was overall positive and the participants claimed that they appreciated the control. With that said, a collaborative playlist should give the creator of a playlist the possibility to set different permission levels on the invited collaborators. When offering this option, the number of permission levels should not be too high as it will result in cognitive overload, nor too low as the user will feel too limited in their control. Additionally, Yuill and Rogers [58] argue that it is essential to have a balance between giving users too much or too little control. To cover this aspect, the levels of permission should cover all ranges of control, everything from letting the collaborator have limited control to letting them have full control. The choice

should be placed in the hands of the creator.

Guideline: Administer access controls of collaborators

The participants from the laboratory study did not want just anyone to have access to the playlist. They wanted to have control over who has access to it and what actions these collaborators can take on the playlist. Based on this, a collaborative playlist feature should offer a way for the creator to have knowledge of who has access to the playlist and in what way. They should also be able to make changes to the collaborators' accessibility level. This could be achieved by providing a view where creators can administer the permission levels of each collaborators.

Control Factor #2. Balance in engagement

One of the biggest challenges with collaborative playlists that could be seen from the literature study was the imbalance in engagements between collaborators. Consequently, these kinds of playlists often ended up with one party being more invested in the playlist than others [43]. As a matter of fact, this was also proved in the data logs, showing that the collaborative playlists are, in the majority of cases, only listened to by the creators. The concern of this consequence was also mentioned in the laboratory study where people saw a risk of not everyone being willing to contribute. Designers must take this into consideration when creating collaborative playlist features.

Guideline: Aid collaborators see value in contribution

When participants tested the feature of suggesting songs to a playlist, some were afraid that their suggestions might never be accepted, and as a result they might not see a value in contributing to the playlist. A way to avoid this issue is to have all collaborators feel included in the collaborative playlist and that they are contributing a value to it. If this goal is fulfilled, more collaborators will feel encouraged to participate in creating a music collection. For this reason, one consideration could be to automatically add suggested songs after a certain amount of time. This is the type of risk the designers need to prevent and have in mind when designing.

Control Factor #3. Visibility of the current state and evolution of the playlist

A study conducted by Yuill and Rogers [58] introduced the importance to provide users of multi-user interfaces with information that keeps them updated about the current state of the interface, as well as the historic actions taken. This is for the collaborators to be aware of what is going on in the interface and to facilitate the collaboration between them.

Guideline: Increase awareness of playlist changes

According to Yuill and Rogers [58] another important factor for a well working multi-user interface is to let everyone be aware of what actions each user has made in the interface. Yuill and Rogers [58] argues that the reason for this lies in facilitating the coordination of efforts and engagement. To complement this argument, the laboratory study showed that it is also important to feel in control

of what is happening in the playlist. To increase this awareness, it could be valuable for collaborative playlist features to offer ways of seeing what changes have been made in the playlist and by whom. A way to affect this guideline is to provide a screen of historical events or recent activities of the playlist.

Guideline: Provide overview of collaborators

Yuill and Rogers [58] also claims that awareness of other contributors in a multi-user interface is important to maintain a good co-experience and to facilitate collaboration. For this reason, it is essential that there is a possibility to get an overview of who is collaborating in the playlist and their assigned permissions. To accomplish this, collaborators could have access to a list of the collaborators.

Control Factor #4: Preference of collaboration within one's immediate circles

Park et. al [44] claimed that people are more willing to use collaborative playlists with people they are familiar with, as it would feel less intimidating. The same statements could be seen in the laboratory study as well. For this reason, collaborative playlists should support interactions like these.

Guideline: Support collaboration between friends and family

From our laboratory study, it was evident that a way to support collaborations within one's immediate circles is to offer simple ways for users to collaborate and share the playlist with the user's contacts. A helpful way could be to recommend friends when sharing the playlist or give the possibility to share the playlist through messaging applications. Another example is to support inviting friends and family by phone numbers.

Control Factor #5. Customizability of the collaborative playlists

A conclusion can be drawn from the laboratory study that the ability to customize a collaborative playlist based on the collaborator's preferences is essential to cover their needs. The main argument for this conclusion is supported by the fact that the participants do not always want to make changes in someone's playlist nor have others making changes to their playlists. Without this option to customize, there is a high probability that they will not see a value in collaborating in it, owing to participants' unwillingness to listen to a playlist containing songs they do not enjoy.

Guideline: Allow collaborators to make adjustments without affecting others

A shared opinion among the participants in the laboratory study as well as in the study conducted by Park and Kaneshiro [43] was the user's fear of stepping on other toes, for instance, by removing someone else's song from the playlist. For that reason, an alternative way of making adjustments to a collaborative playlist should be allowed where the user can make changes without affecting the rest of the group. An example of such a feature could be to let collaborators remove a song for themselves, without removing it for the rest of the collaborators. When

testing this functionality, several participants saw a value of having this. This functionality would in fact minimize the risk of conflicts as no one will feel negatively criticized for its song being deleted from the playlist, meanwhile the user not liking the song is not forced to listen to it. By having these additional features, all parties will be given a better user experience where both get what they want.

Guideline: Minimize the intrusiveness when making changes

A conclusion from the study conducted by Cunningham and Nichols [22] was that fear prevents people from engaging in music selection during collective music listening. A result from the laboratory study that aligns with this statement is that preferably collaborators cannot make changes directly in a playlist, but instead suggest changes to it. In other words, an option to switch to suggestion mode where collaborators can suggest songs to be added or removed from a playlist. To fulfil this desire, a collaborative playlist should offer ways in which collaborators can collaborate without feeling intrusive.

Control Factor #6. Mechanism for coordinating participation

A common opinion arising from the laboratory study was the demand of wanting to control one's participation in a collaborative playlist. The participants did not want to be forced to become a collaborator, but rather have full control over their choices.

Guideline: Give invitees control to decide upon its own collaboration

In the laboratory study, it appeared that participants wanted a clear invitation to collaborate in a playlist. This also support the fact that users want to have the control to decide over which playlists to collaborate on.

6.6.2 Guidelines for Affordance Factors

Affordance Factor #1. Consistency with sharing mechanisms of similar services interfaces

From the laboratory study, it was clear that people approached certain tasks in the way that they usually do in other services. To make it easier for users to handle collaborative playlists, the feature should follow conventional ways of navigating in the design.

Guideline: Be consistent with other collaboration services

In the laboratory study, several participants shared the playlist with others for the sake of inviting people to collaborate on the playlist. This is a common user flow in other services where collaboration is involved. As a consequence, this might be a potential explanation of the participant's approach. Collaborative playlists should therefore follow common design patterns from similar features.

Affordance Factor #2. Visibility of the collaborative playlist feature

The descriptive statistics showed that collaborative playlists are not created to a great extent. When interviewing participants in the laboratory study as well as during the testing sessions, there seems to be a bigger interest in using collaborative playlists than the actual usage shown. One of the conclusions formed from this fact was that the collaborative playlist usage is limited today due to users not being aware of the possibility.

Guideline: Increase consumption of a feature by making it prominent

One way of increasing the knowledge of the collaborative playlist, and potentially resulting in a bigger consumption is to make the feature more prominent. This was evident when the design contained an “add collaborator” button in the playlist view, as the number of participants completing the task of inviting others to collaborate was much higher than in the current version where the functionality is more hidden. Notably, if designers want to encourage users to use the collaborative playlist feature or increase the awareness of the feature, the entry points to it should be placed in a visible place.

Affordance Factor #3. Clarity of available controls and consequences of the actions

From the laboratory studies and testing sessions, the lack of transparency of what an action represented resulted in problems when navigating in the collaborative playlist design. Collaborative playlists should therefore make it obvious for the users what the available actions are and the consequences they will lead to.

Guideline: Make it clear what playlist actions collaborators can take

When inviting participants in the new collaborative playlist design, many of the participants had problems understanding why they could only suggest songs to the playlist instead of making changes directly. This was due to the fact that they were not aware that each collaborator was assigned with a specific permission level. Based on this insight, one way of increasing transparency of available controls is to make it clear what actions a collaborator is allowed to take in a collaborative playlist and why. Notably, it is not enough to show that information once as users most often will not read all information carefully.

Guideline: Clearly differentiate playlist options

To minimize confusion and frustration when using a collaborative playlist feature, the actions available should be clearly differentiated. For instance, when conducting the laboratory study, participants had problems understanding the difference between “make public”, “make collaborative” and “share” as they can be seen to lead to similar results. The same was shown in the testing phase where the difference between “collaborators” and “followers” were difficult to identify, as well as the options to “stop collaborating” and “stop following”.

Guideline: Provide feedback signals after user actions have been taken

Several participants from the testing session commented on their appreciation of feedback signals when an action had been made. Particularly, the feedback signals made them feel more pleased to take actions they were uncertain of as they were confirmed what happened. Feedback signals like these not only allow users to learn about the functionalities of a button along the way but they also reduce the uncertainty until the next time. Feedback signals are great ways of informing the user about the design as there might be limited space on a smartphone to specify each action in detail.

Affordance Factor #4. Multiple related user interactions in one connected flow

The laboratory study showed that when the user had to take several steps that were not connected to each other in an obvious way, they had trouble completing the task.

Guideline: Avoid using several independent steps within the same process

In the testing sessions, the participants could complete a task better if the process was designed to be in one connected flow than in the laboratory study where each step was separated. Henceforth, there is a bigger risk that the user will fail on completing a task if they have to connect several independent steps themselves, without getting hints of how to continue.

Guideline: Minimize context switching

When the user had to switch context to another app while inviting users to collaborate in a collaborative playlist in the laboratory study, they often lost the thread and did not understand if the action had gone through. For this reason, collaborative playlists should minimize the number of context switches as much as possible.

7

Discussion

The discussion section of the report revolves around the reflections about the final results as well as a summary of interesting areas for further investigation and areas that were outside the scope of this thesis. In the end of this chapter, the ethical issues connected to the study and design solutions will be introduced.

7.1 Results

What could be seen from the literature review was that there is little existing research within the field of interfaces supporting multi-user collaboration. There is a need for such research as there is a current trend of co-experience oriented features. Hence, this study can manage to bridge the gap between the literature and the current trend of co-experience. With that said, the final design factors and design guidelines of this study make for a good first step to take when designing mobile collaborative playlists. Each design factor is complemented with design guidelines that have a purpose of providing further recommendations on how to address the overarching design factor. They are derived with enhancing collaboration in mind.

The design factors and guidelines we have identified are of course not bulletproof and to follow them blindly will not automatically give you a perfect collaborative playlist feature. It all depends on the context in which the feature exists. The design factors and guidelines are meant to be relatively generic so that they could be applied by designers of various kinds of mobile collaborative playlists. The line between a generalized and specialized formulation is thin, and there is a possibility that the reader apprehends them in a different way than the authors had in mind. By introducing the quality criteria of *reliability* and *validity*, we can attempt to state the credibility and quality of our results in an ideally objective way. These are two common criteria that researchers usually use when reporting in both quantitative and qualitative studies. Reliability assesses the confidence level of the obtained result being consistent as well as it reflects upon the larger population of interest [27]. Given this, it is debatable whether our population sample of participants covers the range of attributes of the general population that is interested in using collaborative playlists. Although this may be true, the cardinality of our sample

most probably did not allow for reaching the saturation of results across various dimensions of attributes describing all users of collaborative playlists. We can, however, argue that our results benefit from striving in our project for the diverse population of study participants in terms of age, gender, nationality as well as their experience with music services and collaborative playlists.

Validity, on the other hand, refers to the assessment of whether the chosen methods in the project have been applied in an accurate and trustworthy way in order to answer the research question [39]. Validity is considered in our project in terms of its two elements, *internal* and *external validity*. According to Mohajan [39], internal validity discloses "[...] *whether the results of the study are legitimate because of the way the groups were selected, data were recorded or analyses were performed*". Conversely, external validity is concerned with if the study results can be generalized for different settings [39]. One type of external validity, ecological validity, relates to how the environment setting could have an impact on the study results [50]. In our case and in terms of the aspect of ecological validity, our results might be limited by characteristics of the experiment settings. Factors to be considered are the conduct of the laboratory study on the premises and remotely and by having participants evaluate a designated mobile phone interface on the desktop version. Hence, what worked for this population sample of participants might not work for others where these conditions would have been different. Another concern is regarding the fact that we did not include designers in our user tests. As designers will be the one practising our design factors and guidelines, one can debate that the absence of this group decreased the validity of our result. Despite this, Interaction Design Foundation [7] states that the process of User-centred Design should focus on the users. "Users" in this case refers to the users whose requirements and needs will be explored. For this reason, we believe that our end users are the collaborative playlist users because those are the ones we are designing for. After all, it is important to realize that the methods in the project have been delicately considered with the triangulation approach in mind. As defined in chapter 5, we have utilized different research methods with the goal of increasing the validity of the results.

7.1.1 Perception of Control

From our study, it could be seen that it is essential to consider the aspect of control over the collaborative playlist when designing. A playlist creator demands control over their collaborative playlist as they want to steer the directions in which the playlist evolves. Although this demand of the playlist creator is strong, it can be argued that without equal control, there is no collaboration, rather there is one owner that receives help from others. The argument of letting all collaborators contribute on the same terms was mentioned by some participants in the laboratory study. They believed that when agreeing on collaborating together they have also agreed on doing it with equal control. Yet, as the opinions around what control each collaborator should have varied, the decision was made to introduce different permission levels to cover the different needs.

Continuing on unequal collaboration where some have more control than others, there is a risk of not everyone finding it valuable to collaborate, which in turn can lead to lack of engagement. For instance, if the changes made must be accepted by someone else or there is a long waiting time for the changes to be approved, users might be discouraged from contributing. Likewise, when having features that require users to take actions, such as accepting suggestions, there is a big risk that those actions will be ignored. As a result, these suggestions will neither be approved or declined. In order to prevent having suggestions ignored, one possible approach is to allow suggestions be automatically added to the playlist after a certain amount of time. On the other hand, this goes against the fact of granting the creator full control over their playlist and will cause them to feel obligated to take actions in the playlist. The proposed guidelines to get collaborators more engaged in a playlist were to showcase the collaborators the value of their contribution. Although if their contribution is determined by someone's approval or disapproval, it might not be satisfying.

Another aspect of control mentioned in the guidelines was to show the playlist's current state and evolution. It is a great way to coordinate collaborations by having all collaborators be aware of the evolution of the playlist. On the other hand, keeping track of changes can make some people feel monitored, leading to a fear of making changes. A proposed guideline to minimize this fear is to support people to collaborate within one's immediate circles, a requirement the was desired by the users. Albeit the proposed guideline might not strictly limit users of collaborative playlists to collaborate with people they know, the risk of feeling limited in their collaborations might arise. It can therefore be valuable to complement this guideline by allowing users to collaborate with strangers as well. Despite our results on users' preference on collaborating with friends and family, there might potentially be people that appraise the value of collaborating with other users. Moreover, there is a likelihood that this demand is lacking today due to the fact that this is an undiscovered possibility. At times it is not until a feature exists that users understand that they would like to consume it.

The final crucial aspect of control that must be discussed is the possibility to customize a collaborative playlist. The functionality was requested by the participants. However, it is debatable if the playlist can be regarded as collaborative when the collaborators can make individual changes without affecting others. In other words, all collaborators can possibly have different versions of the playlist and thus diminishing the co-experience, resulting in it becoming more of a solo user experience. This does not necessarily have to be a negative impact on the experience, however it might not be as intended.

7.1.2 Affordance

One recurring key point throughout the project process was the low affordance for collaborative playlists. The term affordance in this context simply refers to the lack of awareness of this feature, the incomprehensibility of how to create a

collaborative playlist and the confusion of the next steps. On account of those, the design factors and design guidelines are aimed to solve these issues. Yet, as the project had its limitation in scope it is practically impossible to cover all use cases and edge cases. For this reason, the design factors along with the guidelines have certain limitations.

Firstly, the affordance factor #1 has indicated the importance of being consistent with other sharing services. Staying consistent with other services is unquestionably a safe approach as designers can ensure users understand the action flow. Yet, one can argue that common design patterns are not equal to the best in practice. In other words, it can be a challenge to find design problems as users might have learned the amiss interface and thus become used to the user interface. By always following the common patterns, designers might also miss opportunities to include more innovation in the patterns.

Although, by making the entry point to collaborative playlist more notable where more participants can find their way to create collaborative playlists, there is a risk that it reduces the prominence of other features and blocks them. Moreover, the prominence of the entry point might be experienced as a clutter to the interface for users that do not use collaborative playlists.

Thirdly, one of the issues participants had while using the refined prototype was to understand what has been done after an action was taken. For this reason, a design guideline with the purpose to solve this issue was formed. Yet, increasing the amount of feedback signals can make advanced users interpret them as too basic. To put it differently, as some users might be more experienced with the user interface than the other users, these feedback signals might be more of an interference in the flow rather than being helpful.

Lastly, while connecting multiple steps in one flow can reduce user's cognitive load, too many steps in one flow could also become overwhelming. For instance, if a user accidentally terminates the process then the user might be required to redo the steps all over again.

Generally speaking, the well-known design patterns and guidelines are assuredly a great foundation. However, designers should be mindful that there could be potential situations where these patterns are not applicable. One example mentioned refers to the common approach in sharing services, which might not be the best in practice. Eventually, the presented design factors and guidelines should also only be treated as directions rather than strict rules. What can also be seen is that the design guidelines can be considered and discussed from different perspectives. The designers will have to make decisions which will affect the design, sometimes even in a negative way. The most important thing is that the designers are aware of their choices, and what a decision will lead to.

7.2 Methodological Discussion and Reflections

This section will cover reflections about the executed research process. It will include constructive criticism for the applied methods in each phase of the process, as well as an evaluative discussion regarding their impact on the end result.

7.2.1 Data Inquiry Phase

The first phase in the design process was divided into two parts: gathering data from data logs and conducting a laboratory study with participants. Each part will be discussed individually.

7.2.1.1 Data Logs

The data inquiry from the data logs was a challenging step, however we did manage to collect quantitative data which showed interesting use patterns. As neither of us was familiar with Spotify's data storage system, additional time was spent to get acquainted with the system and to find the relevant data sets. In hindsight we could have started with the inspection of existing data structures and base the queries on them as compared to constructing queries to later find out there are no data structures holding information we were planning to obtain. This could have prevented us from spending unnecessary time on queries we could not run. Nevertheless, we are satisfied with the results retrieved from the data logs as it provided us with an established base of data-based knowledge about the current use patterns. For instance, we could get a much better understanding of the proportion of Spotify's users who use collaborative playlists on a regular basis, information that is impossible to retrieve from the user studies.

7.2.1.2 Laboratory Study

The laboratory study sessions arose numerous reflections. For simplicity, these reflections are divided into three categories: *participants*, *setting and equipment* and the *conducting of the study*.

Participants

To recruit participants to the laboratory study, we had two options, either recruit participants on our own or hire them through a recruiting firm. The primary benefit on recruiting participants ourselves was that we would have the liberty to directly choose the ones that we believe were most suited. Yet, the risk is that the group of people we can select might not be very diverse. For this reason, we chose to use the recruiting firm which allowed us to reach a more diverse group that could at the same time meet our recruitment criteria. In the end we did not utterly receive the target group we asked for even though the participants were selected based on their reply to the screening questions which were dependent on our criteria. As the incentive for participants was to earn money, some participants did not apply full rigor when answering the screening questions in order to increase the likelihood in getting selected. Fortunately, it did not cause too much of a problem and the goal for

the laboratory study could still be achieved. Furthermore, it could be seen that even though the recruiting firm could reach a more diverse group of people, they were not diverse in their geographical location as all participants lived in the Swedish city Gothenburg. There is a risk that the English version do not have the same usability issues as the Swedish version. However, given that the process of creating and using the collaborative playlist remains the same, regardless of where the app is used, the identified usability problems for collaborative playlist most likely do not depend on whether it was the Swedish or the English version.

Another issue with the selection of participants was that two participants were less experienced smartphone users as we did not set that skill as a requirement when recruiting. This resulted in their sessions to focus more on explaining basic mobile app user interface structure, rather than the intended purpose. As the majority of participants were experienced smartphone users, this did not have severe impact on the final result.

Setting and Equipment

One aspect that could have affected the participants' behaviours during the laboratory study was the setup. As in most laboratory studies, some participants might have felt uncomfortable and nervous when being observed. As a result, they might have acted and approached the tasks differently compared to what they would usually do in a familiar environment. This was more prominent among the shy participants where they were more reserved and did not dare to navigate around in the user interface as much.

Another aspect that could have affected the results is that the users interacted with the design on test phones and not their daily devices. Although there were some benefits using our test phones, we could see that the users were more careful in their approach to the tasks as they were not familiar with the phones. We also requested the participants to be a mix of Android and iOS users to fully capture all user types. However, the user interface for these two operating systems had a minor difference between them, and because of this we cannot exclude the operating system being a confounding variable. We were also a bit unlucky with Spotify launching a new iOS version in the course of this user research study, which resulted in the user interface for the first iOS participant to be different from the others.

Conducting the Study

The laboratory studies conducted with the participants ran without major complications over the span of three days. A lot of insights were collected and the aim to understand the target groups was fulfilled. Although the process ran as planned, there were situations that could still be improved. One of such situations occurred when examining the name of the feature "collaborative playlist". The question asked was: *"What would you call a playlist like this?"*. A majority of the participants misunderstood the question and others could not think of a suitable name. Questions like these are too difficult to answer and put a pressure on the participant. A possibly approach would be to provide a list of alternatives,

allowing the participants to pick among these and thus making the question clearer. This will also reduce the required effort in coming up with new names. Another similar insight is related the question *"How would you prefer the collaborative playlist feature to work?"*. This question was for most of the time difficult to answer as many users might have lacked context or simply felt as the question was too open-ended. Among the tasks the participants were to complete, there were two assignments that were impossible to fulfill or not possible to do in a simple way. The reason for giving participants these tasks was to see how they would go about solving them. Instead this caused the participants to feel stupid when not finding the answer. Another improvement needed in the study protocol, was to include follow-up questions directly after a task was completed rather than after several tasks. The reason was that it was challenging for the participants to retell the experience, this would have helped to capture the moment.

Our initial plan was to include a debriefing to the end of each session as a way to open up for discussion and retrieve more information from the participants. This was shown to be a successful approach in the pilot studies with our acquaintances, as they talked more freely about topics regarding collaborative playlists. Yet, for the actual studies, the debriefing was ineffective as most of the participants were not keen on further discussions.

There are also aspects that we had no control over, yet, it is still relevant to reflect upon them as they can affect the results. For instance, as the screening questions were asking about collaborative playlists, we can speculate whether or not the participants might have looked up the feature and thus retrieved more knowledge on it than they originally had, which could have affected their behaviours in the design. We also noticed that some participants seemed to answer in a way they believed would make us satisfied, for example by exaggerating their usage of Spotify or interest in using collaborative playlists. Moreover, we detected that there was a difference between what the participants said and what they did. For example, after a task many participants who unquestionably had difficulties completing it would still claim that it was an easy task. For this reason, we weighted the results from the observation heavier than what the participant's claims.

7.2.2 Problem Analysis Phase

Once the laboratory studies were over, we used Thematic Analysis to help us analyze the resulting data. By following this approach, both of us were able to build our own interpretation of the data as well as to get a much better detailed understanding of the transcribed interviews before our first discussion, which prevented us to influence each other when discussing. As can be seen, Thematic Analysis is indeed a good method to make the data comprehensible and to retrieve the underlying meaning of the data. In addition to this, this method does not require a perfect consensus between the coders in the outcome, as long we could raise discussions on it.

Albeit the advantages with Thematic Analysis, it is a time consuming method. One does not only summarise the data, but also analyze the underlying meaning both individually and together by discussing each code and included citation. Solely comparing codes encouraged us to discuss and analyze them, yet including the comparison for each citation felt overwhelming and unnecessary as it did not add more valuable insights to the code. Moreover, when interpreting the underlying meaning, we also saw a potential risk of interpreting it in the wrong way or over-analysing the intentions.

Given these above points, one can question whether or not Thematic Analysis were worth the trouble. We believe that a better and more fitted method would have been Affinity Diagrams or similar. Affinity Diagram would have helped us focus on the overall context and hence also encouraged a broader discussion around it instead of limiting our perspective in one code or one citation. Yet, Thematic Analysis can arguably have provided us with a deeper understanding of the data. Another alternative would be to simplify the Thematic Analysis process by not conducting a group discussion about each citation and instead solely compare and discuss the codes emerged.

7.2.3 Ideation Phase

The ideation phase comprises three different ideation approaches: *Crazy 8*, *Co-design workshop*, and *Skewing*. The three different methods worked well of complementing each other by having Crazy 8 solve the affordances and perception of control challenges, the co-design workshop to generate new ideas from different perspectives and Skewing to discover new innovative directions.

7.2.3.1 Crazy 8

The ideation phase was initialised with a brainstorming session inspired by Crazy 8. This allowed us to put down our own thoughts and ideas before discussing and potentially biasing each other. As we adjusted Crazy 8 by removing the time limit and number of ideas, it helped us to focus on the insights and come up with multiple solutions to solve the challenges in the current collaborative playlists design.

7.2.3.2 Co-design Workshop

An ideation workshop was initially planned to be held in the Spotify Gothenburg office, however due to the COVID-19 pandemic the session needed to be rescheduled and held remotely. The major advantage of conducting the workshop remotely was that everything was recorded and captured digitally which gave us the possibility to go back and re-watch the session. On another positive side, the initial limitation on the number of participants due to the room capacity and geographical location was no longer a problem. As a result, we included more people from different countries. As this was also recorded, anyone that could not attend the workshop itself still had the possibility to make excessive use of the outcome. On a negative side of holding the workshop remotely, some participants might not be comfortable with

being recorded and there might be more distractions surrounded compared to have the workshop in person.

One of the primary exercises of the workshop was to allow participants discuss freely about their ideas. Yet, holding a virtual workshop challenged this idea. Participants were not as keen on open up for discussion virtually due to being afraid of interrupting each other, waiting for each other to initialize a discussion or simply feeling more uncomfortable. It was also difficult for us to understand whether or not the participants were able to hear or understand a question as people were more reluctant to answer in a group video call and it could not be deciphered from the body language. Additionally, another challenging matter was the estimating the time frame for the new, remote setting. By the end of the workshop we had a lot of time buffer that could have been used in a more valuable way.

In hindsight, conducting a workshop focusing on a diverse group of participants with different background and profession was unquestionably valuable as it helped us to see a wider range of perspectives and generate more ideas. The "How Might We" notes worked as a great way to understand what each participant believed were key points. On the contrary, it might have been stressful to listen to the presentation while at the same time feeling pressured to write down notes.

The approach of having each participant brainstorm individually followed by a group discussion worked very well. The individual brainstorming allowed participants to gather their ideas before getting biased by other participants. However, the time limit might have increased the pressure for participants to come up with new ideas. The group discussion at the end was a great way to capture the opinions and feedback on the participants' ideas. As mentioned before, it was difficult to encourage participants to contribute to the discussion. Eventually, the co-design workshop generated a lot of new ideas, both to improve the collaborative playlist and to enhance the social aspects of it.

7.2.3.3 Skewing

Skewing was applied on the current collaborative playlist feature to change its attributes in order to influence new ideas. The main focus was to skew the social attributes of the design, as it could be seen that social features are appreciated. With this goal in mind, Skewing was by all means a great method to help us enhance the social aspects of the design solutions. Additionally, it was beneficial as it studied the aspects affordance and perception of control in a new way, unbounded by results of the previous phases of the work.

7.2.3.4 Idea Selection

Given that the ideation phase was an iterative process, the idea selection occurred several times throughout the process. However, the ideas were subjectively chosen by us and our team. The process of the idea selection could therefore have been improved by following a more structured selection approach. When choosing ideas merely based on discussions, there is a risk that good ideas disappear owing to some participants being more persuasive and some ideas being discussed less. As a result, the elected idea can be based on the most influential conversations.

7.2.4 Prototyping Phase

The prototyping phase consisted of creating *paper prototypes*, *heuristic evaluation* and *wireframing*. The procedures for these three stages are discussed here.

7.2.4.1 Paper Prototypes

As the paper prototypes were made with post-it notes, it was easily possible to add new ideas, remove ideas or simply replace some parts of a sketch. By doing this step first, it allowed us to better evaluate the different design solutions before moving on to creating more detailed prototypes that are more difficult to update. Moreover, this step helped us to focus on the overarching design solutions rather than to delve into the details. In spite of the positive sides, this was a tedious step being that every idea needed to be conveyed and evaluated with in-depth discussion. Although it was time consuming, the low fidelity prototypes helped detect and fix major problems quickly. At times it was easier to explain ideas visually than by words, which leads us to believe that it contributed to more effective communication as well.

7.2.4.2 Heuristic Evaluation

Heuristic evaluation was conducted in three rounds and all were undeniably valuable in their own unique way. This method helped us to gather feedback on the overarching design solutions as well as the scope of our collaborative playlist project. For the design solutions themselves, this method prevented our final designs from having common design flaws as the experts pointed out general affordance issues. With all these expert reviews, we could make sure that our design solutions followed not only the general design guidelines but also the underlying design theme in the Spotify app, of which the collaborative playlist is part of. Another key point to have in mind is that the experts were all working for the same company and hence their feedback, which might be influenced by the company's goal, could differ from a general design expert population.

7.2.4.3 Wireframing

As for the wireframes, the process was less time consuming than expected. Since the wireframes were constructed in the collaborative interface design tool *Figma*, graphical interface components could be reused in different places and it was possible to make local modifications and overrides of them, which facilitated the

work. Additionally, there were a few plugins installed by default for the design tool that aided the work, such as generating multiple rows of songs rather than us manually creating each row.

In summary, our process of wireframing spared us the tedious work due to the established design system we used. Although all this pointed the positive sides, one can argue that the components limited the designers' creativity and freedom to explore the design solutions. Moreover, an issue has surfaced when connecting the views together. The purpose of connecting the views was to enable the test participants to interact with the design prototypes as it would have been a regular app. This process required a lot of effort as many views needed to be connected and several use cases needed to be covered.

7.2.5 Testing Phase

This section includes reflections from the testing phase of the design process. The reflections have been divided into three parts, one part about the participants, one about the settings and equipment and a last one about the conduct of the study.

Participants

The targeted user groups for the testing phase were the same as for the first user research study, that is the laboratory study. Yet, in this round of user tests the sessions were conducted in English via the customer experience platform called *UserTesting* [54] with participants from around the world. The advantage of having geographically diverse participants is that we could evaluate the design prototype without limiting our result to one region. The participants were recruited via UserTesting based on their response to the screening questions. These questions aimed to help determine the eligibility of the respondents. Although we revised our requirements of the participants based on the previous study, we still received one participant that was not that familiar with smartphones and another that works as a developer, which our screening questions were aimed at filtering out of the study sample. The reason for filtering out developers is because they focus on the flaws of a product rather than the user interactions in a way that regular users would not. However, this was not a severe issue as they still provided us with value input. Among the participants, there were also a product manager and a computer engineering student that could be questioned whether or not they were suitable test participants according to our screening criteria.

A similar issue of participants not answering sincerely as reported for the first laboratory study still remained. Some participants claimed that they had used collaborative playlists when answering the screening questions, but revealed the opposite during the testing session. Others stated that they were collaborative playlist users, but in reality, they had only been invited to one without contributing to it, nor created one themselves. Despite this problem, we managed to get enough collaborative playlists users. Given that the percentage of

collaborative playlist users is fairly low, we expected it to be more challenging to recruit these users. In reality, this was not the case.

Although the recruitment through UserTesting [54] went effortlessly, a negative side of using their service is that many of the users are experienced in testing and evaluating prototypes. Some of these participants might point out feedback that is beyond what a regular user would do. It was noticeable that some participants would spend longer time to evaluate each screen and components. While it is valuable in terms of the quality of received feedback, some of it felt like it was a result of excessive analysis. One session with a participant even resulted in a termination of the tests as this participant was being too articulate of providing redundant amount of feedback and hence, exceeded the time limit allocated to the session that could not be extended due to platform's policy. Another important key point to mention is the fact that UserTesting [54] selected our participants for us. As much as this provided a lot of convenience, if allowed to select the participants we could have included a more diverse group in terms of evenly distributed across the world and genders.

Furthermore, one disadvantage of including Spotify users in our target groups was that some of them expected the design to be in the way they were used to. For instance, some participants had difficulties realizing that the "share" view also referred to inviting collaborators. This affected the results obtained from this group of participants as they were biased by being exposed to the original version of the interface.

Settings and Equipment

Despite the fact that it was conducted remotely, the testing phase went on relatively effortlessly. This is because we were able to make use of great tools to minimize the obstacles when holding and recording the user tests. In spite of this, there were two parts of the session that were time consuming. One of them was the setup for the participants to sign the Non-Disclosure Agreement (NDA) which also included the consent form of the study. In contrast to signing a NDA on-site, users will need to receive a link containing the NDA in digital form, open it, navigate to the input for signing, sign it, and lastly receive a confirmation email to confirm the signature. As can be seen, this was a time consuming step which drifted away time from the session. Although we attempted to minimize this by asking participants to sign the NDA prior to the session, there were a number of participants that did not follow the instructions.

Similar to the NDA process, there were some technical issues when using Figma [1] for the design evaluation. The link to the design prototype on Figma's servers took some time to finish loading and resulted in consuming time of the session. We became fully aware of this interference during the pilot tests, however as we did not want the participant to access the prototype before the test, nothing could be done to prevent it. Moreover, we needed participants to log in to Figma in order to disable hints of where to click in the prototype to be able to evaluate the user's

experience without any guidance. This was also moderately time consuming. All these technical issues were also dependent on the participants' internet connection, as was the quality of the video call.

Conducting the Study

The testing phase allowed for the evaluation of the design prototype with potential users. Not only did the tests help us to discover potential issues in the design, but also to detect confusions that we could not have foreseen. One of the drawbacks on holding the testing phase remotely, was the challenges to decipher the participants' reactions through their body language. Another limitation was that we could not evaluate how the participants would have interacted with the design on an actual phone instead of the desktop version of a phone that had to be the case for this remote session. Although the sessions worked well, the outcome was most probably an influence of the fact that the interaction and experience on a phone differs from the desktop.

A big improvement in these testing sessions, compared to the laboratory study, was how we captured the participants reactions. Owing to the fact that participants had issues retelling their reactions in the laboratory study when the follow-up questions were asked too late, the follow-up questions were restructured to come immediately after each task this time. As a result, we were able to capture the feedback with minimized recall bias. It is questionable whether it is of preference to include the follow-up questions right after each task, risking the flow to become interrupted. Nevertheless, in our opinion the outcome improved considerably with this approach.

In hindsight, there were some improvements that could be considered in the future. One of them is to not give over-explained tasks to the participants such as *"Please remove yourself as a collaborator"* or *"You would like to invite Max by his username "maxy"*, because participants might find the correct answers from the task themselves, resulting in an incorrect result of the test. In reality, participants might have completed the task with another approach. On the other hand, these explicit tasks have to be included as we wanted the participants to experience these parts of the design. Yet, with all things considered, the testing phase could be described as a success. This conclusion is based on the fact that the assumptions about the design created from the laboratory study has demonstrated to be of value in the new design prototypes.

7.2.6 Summative Analysis Phase

The last phase of the thesis project was the summative analysis phase with the aim to analyze the result from the user testing. Affinity Diagrams was implemented in this phase unlike the laboratory study where we used Thematic Analysis to analyze the results. In contrast to the Thematic Analysis, the Affinity Diagram helped us to get a better overview of the findings quickly and to group the findings and find relevant results. Due to the fact that we did not have to analyze the transcripts individually

and discuss our individual results to make collective conclusions, Affinity Diagrams required less time than the Thematic Analysis and instead we could analyze the result together. On the other hand, the advantage of analyzing individually to not bias each other's initial thoughts is removed. Nevertheless, the result ended up to be very valuable. For this reason, we felt that this method was more applicable for our use case than the Thematic Analysis. The reason behind was that the structure of the testing session was semi-structured, meaning that not all participants received the exact same questions. Another key point worth mentioning is the flexibility that was provided with Affinity Diagram. The underlying reason for this claim is that the groups formed with Affinity Diagram can easily be restructured and organised in new groups. On another note, in the course of performing this method, we always had the possibility to read through the transcripts again and separate, merge or form new groups.

7.3 Future Work

In view of the nature of wicked problem, the suggested design factors and guidelines would preferably have gone through a few more iterations in order to be evaluated even more thoroughly. The evaluation of the design prototypes could be carried out to a larger extent, for instance with a more diverse group of participants from various demographic backgrounds. Although the participants of the last user study were from around the world, the prevalent desired use case for collaborative playlists seemed to remain the same, that is using collaborative playlists for parties or for a certain purpose in general. Besides the investigation of the most popular use case of collaborative playlists, another interesting aspect is to carry out larger test sessions. As the user testing sessions have been mainly focusing on recruiting participants to evaluate the design, it is still a question on how does the design perform in real life which consequently has an impact on final design factors and guidelines. Henceforth, another avenue of research can be to conduct user testing sessions using methods such as, for instance, diary studies where participants are asked to use collaborative playlists in reality.

A majority of the participants from both the laboratory study as well as the final evaluation study voiced concern about conflicts that can be provoked when engaging with a collaborative playlist. Although the concluding design factors aim to cover this aspect, additional research can certainly be done. The situations where conflicts often can be provoked are pointed out by the participants, usually when a collaborator adds songs the other collaborators dislike or a collaborator removes a song from a playlist without consent. The participants also claimed that they would feel more inclined to engage in collaboration if they could give an explanation of certain actions that might provoke conflicts, for instance by explaining to the other collaborators why he or she removed a song. A second approach to minimize the conflicts between collaborators is to explore on a voting system. This is something suggested by several participants and is believed to increase consensus about changes introduced to the playlist. For instance, the voting systems can be used to add songs to the playlist but also for situations

when someone wants to remove songs.

Several sources as well as participants have also claimed that collaborative playlists are associated with and often used in social activities. One example is to create a collaborative playlist for a party with friends or for a road trip. Although the design process indeed included certain social features, yet given the scope of the project, many of these ideas were omitted. For this reason, a further research can be done to explore the possibility to integrate social features. One example of such a social feature is the feature that we have implemented showcasing what other collaborators are listening to at the moment. This feature was treated as a bonus feature in the design prototype and was not paid that much attention. Therefore, one can examine whether or not this is a feature that users would like to be included in the design. Likewise, designers could explore the possibility to enhance solidarity among the playlist collaborators by allowing a replacement of the cover image of a playlist with a photo of the group. Moreover, the popular feature in social media where users can react on others' contributions, could be something worth delving into in terms of including it into the collaborative playlist.

Another innovation area that could be further researched on is communication. Many participants in our conducted studies as well as the literature study supported the fact that people like to discuss music. For this reason, it might be valuable to look into the possibilities of implementing a way that allows users to communicate with each other in a collaborative playlist. For instance, designers could evaluate the impact of integrating the collaborative playlists along with a chat functionality.

Lastly, one thing worth considering is that the new design as well as the design factors merely focus on assisting users in finding collaborators within one's immediate circle. While this is something that has been supported by both the literature study and the feedback from the users, one can argue that it might be worth delving into the opportunity to help users find people to collaborate with that they do not know.

7.4 Ethical Issues

The major ethical consideration connected to this research regards the user privacy. User data is collected and interpreted to understand how Spotify's users are interacting with the current collaborative playlists feature. This might feel invading toward the user's integrity, even though the users have agreed on the terms and conditions in connection with the Spotify sign-up. Additionally, participants might not read these length and legalese-filled Terms of service. Another consideration is whether it is of an ethical issue or not that Spotify shares their user data with the authors of this thesis to make this research possible, despite the authors signing the non-disclosure agreement. However, most people would probably say that this is an example of a fair use of the collected data, since the entire project's goal was to improve the app's functionality for the users.

As user research methods such as observations and interviews were used, these sessions could be perceived as intruding, especially when recording these sessions. However, all study participants were given a full briefing of the study aims and procedure before they will be asked to give an informed consent to participate in the study. Either way, the participants in the usability testing may feel uncomfortable and the answers to be more reserved.

Additionally, the improved user experience of the collaborative playlist may result in unintended use of our results, for instance, companies or users might share their playlist to people and push them to listen to it in an unsolicited way, what can be perceived as a form of spam.

Another ethical consideration might be a possible intrusion into users privacy by the core elements of the collaborative playlist feature. In order to make the playlist more personal and enhance solidarity, one focus was to add profile images of the collaborators. Although this can make creators as well as other collaborators to get a better overview of who is collaborating, some collaborators might not want others to know about their collaboration. Similarly, some users might not appreciate that other users can see what oneself is listening to or contributed with. In fact, this was something the participants clearly articulated.

8

Conclusion

This thesis aimed to study the design factors influencing the affordances and perception of control of collaborative playlist used on mobile devices. The purpose of identifying the design factors was to provide directions for designers facing design challenges of collaborative playlist. The research question driving this study is as follows:

What UX design factors in terms of affordances and user's perception of control should be considered when designing mobile collaborative playlists?

To answer the research question the user-centred design process was followed whilst adapting it to the industrial use case. The process was initialized by conducting interviews and observation sessions about the current collaborative playlist feature. As a complement, data logs capturing the use of the collaborative playlist feature were also examined. Based on the insights from the data inquiry phase, new design ideas were ideated on and realized in prototypes. The final design prototypes obtained from that iteration were used for testing and evaluation with participants. Subsequently, the design factors and guidelines were derived.

The resulting design factors were divided into two categories, one for design factors influencing the user's perception of control and the other including factors that affect the affordances of the feature.

Perception of Control Factors

Control Factor #1. Control mechanisms for playlist creator

Control Factor #2. Balance in engagement

Control Factor #3. Visibility of the current state and evolution of the playlist

Control Factor #4. Preference of collaboration within one's immediate circles

Control Factor #5. Customizability of the collaborative playlists

Control Factor #6. Mechanism for coordinating participation

Affordance Factors

- Affordance Factor #1. Consistency with sharing mechanisms of similar services interfaces
- Affordance Factor #2. Visibility of the collaborative playlist feature
- Affordance Factor #3. Clarity of available controls and consequences of the actions
- Affordance Factor #4. Multiple related user interactions in one connected flow

From each of the identified design factors, a set of design guidelines were derived in order to succinctly explain how to create an enhanced co-experience for mobile collaborative playlist. The first set of guidelines focused on making collaborative playlist users feel in control over the playlist. One of the guidelines specifies the importance of granting the playlist creator full control over their playlist. Additionally, the creators should have the ability to administer the permission levels of the invited collaborators. They should also have the option to get an overview of which users that are currently collaborating in the playlist and their assigned permissions. Likewise, a collaborative playlist should allow collaborators to see the recent activities in the playlist.

To encourage contributions to a collaborative playlist, the interface must aid collaborators to see the value of contributing whilst minimizing the feeling of intrusiveness of making changes. Thus it could be helpful to allow collaborators to make adjustments without affecting others. Moreover, in order to make the collaboration less intimidating, it could be beneficial to support collaboration between friends and family.

When it comes to enhancing the affordance of collaborative playlists, it is essential to be consistent with other collaboration services in order to facilitate the navigation within the user interface. Another important aspect of design is to clarify what playlist actions collaborators can take and what each options implies. Furthermore, feedback signals should be provided to make users more aware of the actions taken. Lastly, to assist users in discovering the feature more easily, the entry points should be prominent and the control flows of the interface should avoid disjointed steps and context switching.

As can be seen, there are multiple factors to take into consideration when designing a collaborative playlist. Although there are indeed quite a few factors to keep in mind, the effort to follow the design guidelines will eventually enhance the co-experience for everyone involved. Given the fact that music is a fundamental part of our social interactions, improving the user experience of social music features can ultimately improve the social qualities in these contexts.

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A

Timeline

The timeline below describes the working process of this thesis. It is divided into three major phases, as Chalmers suggested: *project initiation*, *project work* and *report writing & presentation*. During the actual work, the approach is further divided into six different sub-phases: *data inquiry*, *problem analysis*, *ideation*, *prototyping*, *testing* and *summative analysis*. This implies that there will be two user studies conducted.

PROJECT INITIATION		
Week	Date	Project Session
4	20/1 - 24/1	Getting started with Spotify Understand Spotify's structure Literature studies Find related work Find other music streaming services
5	27/1 - 31/1	Literature studies Understand Spotify's mobile design guidelines
6	3/2 - 7/2	Literature studies Write the planning report Plan design methods with Spotify Prepare for the first user research <ul style="list-style-type: none"> • Recruit participants • Set preliminary dates
7	10/2 - 14/2	Write the planning report Retrieve access to the data logs

A. Timeline

PROJECT WORK			
Week	Date	Project Session	Design methods
8	17/2 - 21/2	Data inquiry phase Plan laboratory study Pilot test laboratory study Conduct laboratory studies 27/2, 28/2 and 2/3 Data inquiry from data logs Transcribing	Laboratory study with interview and think-aloud observation
9	24/2 - 28/2		
10	2/3 - 6/3		
11	9/3 - 13/3	Problem analysis phase Transcribing Analysis of qualitative and quantitative data	Calculating/retrieving descriptive statistics Thematic analysis of the open-ended data
12	16/3 - 20/3		
13	23/3		
13	24/3 - 27/3	Ideation phase	Crazy 8 Co-design workshop Skewing Idea selection
14	30/3 - 31/3		
14	1/4 - 3/4	Prototyping phase	Paper prototyping Heuristic evaluation Wireframing
15	6/4 - 10/4		

A. Timeline

16	13/4 - 17/4	Testing phase	Laboratory study with interview and think-aloud observation
17	20/4 - 24/4		
18	27/4 - 1/5	Summative analysis phase Transcribing Analysis of qualitative data	Affinity Diagram

REPORT WRITING & PRESENTING			
Week	Date	Project Session	
19	4/5 - 8/5	Report writing Submission of the first draft to the academic supervisor	
20	11/5 - 15/5		
21	18/5 - 22/5	Deadline for the final draft of the report Opposition Preparation for the presentation Trail run of the presentation	
22	25/5 - 29/5	Final presentation Work with the feedback received Proofreading	
23	1/6 - 5/6	Continue to work with the feedback Proofreading Presentation for the company Final submission	

B

Laboratory Study Protocol

Structure

Introduction | 5 min

Provide context into the observation

Interview Session | 25 min

Warm-up questions and questions about social music experience and desire

Observation Session | 15 min

Think-aloud protocol to observe people when interacting with the collaborative playlists in Spotify

Debriefing | 5 min

Informal discussion about the session

Target groups

Group 1: New Users

The reason for including this group is to ensure that the data will be collected from those who aren't and have not been familiar with Spotify. In this way we can find the problems with the design that might not occur to current Spotify users.

Group 2: Spotify Collaborative Playlist Users

The reason for studying current collaborative playlist users is to understand how and why they are using the feature as well as how they react to the new design.

Group 3: Spotify Non-Collaborative Playlist Users

The reason for including the non-collaborative playlist users is to first, understand why they are not using the functionality and secondly, how they will react to the new design without being biased by the familiarity with the previous version of the collaborative playlist.

Introduction

Welcome

About us

- Thank you for taking the time to meet with us today.
- We come from Chalmers IxD Master Program and are currently working as thesis interns at Spotify.
- I will be the one holding the session and she will be taking notes but might also add some questions.

Assignment

- We want to collect your feedback on social music experience. You will be given a few questions and tasks connected to the use of the Spotify app. As you explore the app, it is important that you think out loud, for us to understand what you think and how you feel when using the app.
- There is no right or wrong here, so be honest with what you feel. We didn't have a part in the current design, so your comments are neutral to us.

Session

- The session will last about 60 minutes and it is divided into two parts, an interview session and an observation session.
 - You have the right to stop the session whenever you want, so just tell us!
 - The session will be recorded and observed. All the recordings and opinions shared are confidential and anonymous, and will only stay within the project team until the end of the year.
 - Are you okay with that?
[Ask them to sign the recording consent]
 - NDA
 - Right to record
 - Right to use the data we have gathered
 - You are over 18
 - You agree that you will not spread what you have seen from the app
- [Confirm the session is on Hangout and being recorded]
- Do you have any questions before we start?

Interviews

Warm-up questions

About the participant

- Tell me a bit about yourself...
 - What is your name?
 - How old are you?
 - Where are you from?
 - Where do you live?
- What do you do for a living?

Phone usage

- How many years of experience do you have of using a smartphone?
- Would you say that you are a skilled smartphone user?
- Do you use many apps?
- If you download a new app, do you usually need help from others to understand it?

Music listening

- What type of music do you usually listen to?
- Do you use a music service to listen to music?
[If yes:]
 - Which one do you use?
 - How long have you used it?

Sharing music questions

We will now continue with questions about music sharing. This part does not have to be related to Spotify, as we want to know about your music sharing behaviour in general. So feel free to talk about whatever way you use.

- When do you listen to music?
- How often do you listen to music?
- How do you find new music to listen to?
- Do you usually listen to music physically together with a friend?
[1 If yes:]
 - When do you listen to music when you are physically together with a friend?
- Do you share or have you shared music with others? For instance, if you find a song you like, do you recommend it to a friend?
[2 If yes:]
 - Why do you share music with others?
 - How do you share music with others?

- Usually with whom do you share music?
- What would be the best way to share music with others according to you?
- If a friend of yours shares a song with you, how do you want to receive it?
- What kind of content do you typically share? Is it only music?

[2 If no:]

- Would you mind telling us why you do not share music with others?
- Would you like to?

[2.1 If yes:]

- What would be the best way to share music with others according to you?
- If your friend shares a song with you, how would you like to receive it?

[2.1 If no:]

- Would you mind telling us why you would not like to share music with others?

Collaborative playlists questions

- Spotify has a function where you can share playlists with others. In these playlists you and your friends can add, delete and reorder the tracks in the playlist. Have you heard about this function before?

[1. If yes:]

- Have you ever used this feature?

[1.1 If yes:]

- Can you tell us about one time you used it?
- What did you think about the feature?
- When do you typically use this feature?
- Why do you use it?
- Who do you usually use it with?

[1.1 If no:]

- Would you mind telling us why you have not used it?
- Would you consider using it?

[1.1.1 If yes:]

- How would you use these playlists?
- Can you tell us about a time in which you would like to have used the feature?
- What do you want to get out of a playlist like this?

[1.1.1 If no:]

- Can I ask you why?

[Go to observation]

[1. If no:]

- Would you like to use such a feature?

[1.2 If yes:]

- How would you use it?

[1.2 If no:]

- Would you mind explaining why?

[Go to observation]

- How would you prefer this feature to work?
- What would you call a playlist like this?

Permissions

- Let's say that you have a playlist like this together with some friends
 - As a person who was invited to the playlist, what would you like to be able to do? .
 - If you instead were the creator of the playlist, what would you like to be able to do?

Invitations

- What would be the preferred way to invite others to such a playlist?
- Who do you think should be able to invite others to the playlist?

Observation session

- We will now start the observation part where we will give you a couple of tasks for you to complete in the Spotify app.
- Please do not feel any pressure on completing the tasks. We are only interested in knowing how you feel and think around the tasks.
- We would therefore appreciate it if you could tell us out loud what you are doing and what you are thinking while interacting with the app.
- Before we start, you can choose between using an Android or iPhone. Choose whichever you feel most comfortable with.

Scenario 1

Scenario description

You and Gaby/Michelle are having a birthday party. You want to create a playlist together which both of you are allowed to edit.

Tasks

- *Show us in the app, how you would create such a playlist*
[User should create a collaborative playlist - help if needed]

- *Invite Gaby/Michelle to the playlist*
[Tell the user that they and X have a playlist together, meaning that both can edit the playlist]
- *Add 3 relevant songs to the playlist*
[G/M: Add three songs]
[Tell the participant that you have added songs to the list as well]
[Ask which three songs the user added]
- *Remove 1 song*
- *Add 2 songs from the list of recommended songs*
[G/M: Delete three songs at the same time]
- *Choose a song from the list to listen to*

Questions

- *What was your experience of creating a collaborative playlist?*
- *What was your experience of the invitation process?*
- *What was your experience of adding and removing songs?*
- *What was your experience of someone else removing your songs?*
- *Would you have wanted the feature to work in another way?*

Scenario 2

Scenario description

You have been invited to a collaborative playlist with swedish pop music. You love swedish pop and want to continue using the list.

Tasks

- **[Send invitation to the collaborative playlist]**
[Receive an invitation to a collaborative playlist]
- Look through the list
- Press the search button in the menu at the bottom
- Find a song from one of Spotify's pop playlists to add to this playlist
[User should not be able to find the playlist again]
[Ask user what happened]
[Ask user to go back to the invitation link and access the playlist again]
- Save the playlist to your library
- Remove 1 song that has been added by Michelle
- See who is using this playlist
- Go to your library and tell us which one of the playlists are collaborative

Questions

- *What was your experience of getting invited to the playlist?*
- *What was your experience of saving the playlist to your library?*

- *What was your experience of removing others' songs?*
- *What was your experience of seeing who has access to the list?*
- *What was your experience of finding the collaborative playlist in your library?*
- *Would you have wanted the feature to work in another way?*

Debriefing

- Thank you again for helping us, we appreciate it a lot!
- This was very valuable for us as we are looking at the collaborative playlist function to see if it can be enhanced.

C

Screening for User Test Recruiting

Spotify Collaborative Playlists Users

1. You need to sign a non disclosure agreement (NDA) to participate in this study. If you do not want to sign an NDA, please select "No, I do not agree" below. The link to the NDA will be the first task in the study. If you complete the study without signing an NDA your test will be deleted and you will not be paid. Are you willing to sign an NDA to take part in this study
 - Yes, ok signing an NDA [May Select]
 - I'm not sure [May Select]
 - No, I do not wish to sign an NDA [Reject]
2. For this study, you will need a computer with a webcam. Are you willing to show your face during the study?
 - Yes, ok to show my face [May Select]
 - I'm not sure [May Select]
 - No, I do not wish to show my face [Reject]
3. You will also need to present your screen in addition to the webcam. Are you willing to present your screen?
 - Yes, ok to present my screen [May Select]
 - I'm not sure [May Select]
 - No, I do not wish to present my screen [Reject]
4. How long have you been using a smartphone?
 - Less than 6 months [Reject]
 - 6 - 12 months [Accept]
 - 1 - 2 years [Accept]
 - 2 + years [Accept]
5. Thinking about your smartphone, can you tell me which of these best describes you?
 - (a) I understand smartphones very well, I could even build an app. [Reject]
 - (b) I'm confident using a smartphone. I can usually figure out new apps. [Accept]
 - (c) I'm confident using the apps I know, and I don't mind trying new apps, but sometimes I get confused. [Accept]
 - (d) I only use apps I know well, I don't feel confident using new apps. [Reject]
 - (e) I'm not confident using my smartphone, I wouldn't know how to download a new app. [Reject]
6. What's the make of your smartphone?
 - iPhone [Accept]
 - Android [Accept]
 - Windows Phone [Reject]
 - Other/Don't know [Reject]

7. Which of these moments in your life do you most often find yourself listening to music? (Select all that apply)
- When I'm getting ready for the day [May Select]
 - On my commute to work [May Select]
 - At work [May Select]
 - At home while doing housework [May Select]
 - When I'm driving / when I'm in the car [May Select]
 - When I'm hanging out with friends [May Select]
 - While working out (at the gym, running etc) [May Select]
 - When I'm at or hosting a party or event [May Select]
 - While playing playstation [May Select]
8. Which of these statements best describe you as a music listener? (Select all that apply)
- I just like good music, I'm not a fan of any particular artist. [May Select]
 - I listen to a variety of stuff but some artists I keep going back to [May Select]
 - There's artists I really love - I go to their shows and seek out their latest stuff [May Select]
 - I'm obsessed with my favourite artists - I know everything about them! [May Select]
9. Which of the digital streaming services you currently use the MOST to listen to music? (Select all that apply)
- Amazon Music [May Select]
 - Apple Music [May Select]
 - Google Play [May Select]
 - iTunes [May Select]
 - Pandora [May Select]
 - Soundcloud [May Select]
 - Spotify [Must Select]
 - Tidal [May Select]
 - Youtube [May Select]
 - None of the above [May Select]
10. How long have you been a user of Spotify?
- Never [Reject]
 - I have only used Spotify from my friends'/family's account [Reject]
 - Less than a month [Reject]
 - Less than a year [Reject]
 - 1-2 years [Accept]
 - 2+ years [Accept]
11. For Spotify (or the most used digital service you selected), do you currently pay or use the free service?
- Pay [Accept]
 - Free Service [Accept]

- Do not use [Reject]
- 12. Which of the following things do you regularly do on Spotify (or your most-used digital service)? (Select all that apply)
 - Search for artists and listen to their music [May Select]
 - Browse and listen to genre and mood playlists made by Spotify [May Select]
 - Browse and listen to personalised playlists (example: Discover Weekly) [May Select]
 - Browse and listen to playlists made by friends [May Select]
 - Make my own playlists [May Select]
 - Listen to my own playlists [May Select]
 - Make playlists with friends [May Select]
 - Listen to Radio [May Select]
 - Save/Favorite songs, albums or artists [May Select]
 - Send music to friends [May Select]
 - None of the above [May Select]
- 13. How often do you normally listen to music?
 - Never [Reject]
 - Less than once a month [Reject]
 - Monthly [Accept]
 - Weekly [Accept]
 - More than once a week but not every day [Accept]
 - More than an hour every day [Accept]
- 14. Which of these moments in your life do you most often find yourself listening to music with friends? (Select all that apply)
 - When studying with friends [May Select]
 - On a roadtrip with friends [May Select]
 - With friends over a drink [May Select]
 - While working out with friends [May Select]
 - When I'm at a party or event with friends [May Select]
 - I do not listen to music with friends [Reject]
- 15. How often do you listen to music together with other people? (Select all that apply)
 - Never [Reject]
 - Yearly [May Select]
 - Once a half year [May Select]
 - Once a quarter [May Select]
 - Monthly [May Select]
 - Weekly [May Select]
 - Everyday [May Select]
- 16. Have you created a playlist in which multiple people can collaborate and edit? (Select all that apply)

- I do not collaborate music with friends [Reject]
- I only create playlists alone [Reject]
- I have created a collaborative playlist together with 1 - 2 people [Must Select]
- I have created a collaborative playlist together with 3 or more people which they can edit [May Select]
- I have created a playlist together with friends, but they do not have the ability tot edit it [May Select]

Non-Spotify Users

Screener

1. You need to sign a non disclosure agreement (NDA) to participate in this study. If you do not want to sign an NDA, please select "No, I do not agree" below. The link to the NDA will be the first task in the study. If you complete the study without signing an NDA your test will be deleted and you will not be paid. Are you willing to sign an NDA to take part in this study
 - Yes, ok signing an NDA [May Select]
 - I'm not sure [May Select]
 - No, I do not wish to sign an NDA [Reject]
2. For this study, you will need a computer with a webcam. Are you willing to show your face during the study?
 - Yes, ok to show my face [May Select]
 - I'm not sure [May Select]
 - No, I do not wish to show my face [Reject]
3. You will also need to present your screen in addition to the webcam. Are you willing to present your screen?
 - Yes, ok to present my screen [May Select]
 - I'm not sure [May Select]
 - No, I do not wish to present my screen [Reject]
4. How long have you been using a smartphone?
 - Less than 6 months [Reject]
 - 6 - 12 months [Accept]
 - 1 - 2 years [Accept]
 - 2 + years [Accept]
5. Thinking about your smartphone, can you tell me which of these best describes you?
 - (a) I understand smartphones very well, I could even build an app. [Reject]
 - (b) I'm confident using a smartphone. I can usually figure out new apps. [Accept]
 - (c) I'm confident using the apps I know, and I don't mind trying new apps, but sometimes I get confused. [Accept]
 - (d) I only use apps I know well, I don't feel confident using new apps. [Reject]
 - (e) I'm not confident using my smartphone, I wouldn't know how to download a new app. [Reject]
6. What's the make of your smartphone?
 - iPhone [Accept]
 - Android [Accept]
 - Windows Phone [Reject]
 - Other/Don't know [Reject]

7. Which of these moments in your life do you most often find yourself listening to music? (Select all that apply)
- When I'm getting ready for the day [May Select]
 - On my commute to work [May Select]
 - At work [May Select]
 - At home while doing housework [May Select]
 - When I'm driving / when I'm in the car [May Select]
 - When I'm hanging out with friends [May Select]
 - While working out (at the gym, running etc) [May Select]
 - When I'm at or hosting a party or event [May Select]
 - While playing playstation [May Select]
8. Which of these statements best describe you as a music listener? (Select all that apply)
- I just like good music, I'm not a fan of any particular artist. [May Select]
 - I listen to a variety of stuff but some artists I keep going back to [May Select]
 - There's artists I really love - I go to their shows and seek out their latest stuff [May Select]
 - I'm obsessed with my favourite artists - I know everything about them! [May Select]
9. Which of the digital streaming services you currently use the MOST to listen to music? (Select all that apply)
- Amazon Music [May Select]
 - Apple Music [May Select]
 - Google Play [May Select]
 - iTunes [May Select]
 - Pandora [May Select]
 - Soundcloud [May Select]
 - Spotify [Reject]
 - Tidal [May Select]
 - Youtube [May Select]
 - None of the above [May Select]
10. How long have you been a user of Spotify?
- Never [Accept]
 - I have only used Spotify from my friends'/family's account [Reject]
 - Less than a month [Reject]
 - Less than a year [Reject]
 - 1 - 2 years [Reject]
 - 2+ years [Reject]
11. For Spotify (or the most used digital service you selected), do you currently pay or use the free service?
- Pay [Accept]
 - Free Service [Accept]

- Do not use [Reject]
- 12. Which of the following things do you regularly do on Spotify (or your most-used digital service)? (Select all that apply)
 - Search for artists and listen to their music [May Select]
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 - Browse and listen to personalised playlists (example: Discover Weekly) [May Select]
 - Browse and listen to playlists made by friends [May Select]
 - Make my own playlists [May Select]
 - Listen to my own playlists [May Select]
 - Make playlists with friends [May Select]
 - Listen to Radio [May Select]
 - Save/Favorite songs, albums or artists [May Select]
 - Send music to friends [May Select]
 - None of the above [May Select]
- 13. How often do you normally listen to music?
 - Never [Reject]
 - Less than once a month [Reject]
 - Monthly [Accept]
 - Weekly [Accept]
 - More than once a week but not every day [Accept]
 - More than an hour every day [Accept]
- 14. Which of these moments in your life do you most often find yourself listening to music with friends? (Select all that apply)
 - When studying with friends [May Select]
 - On a roadtrip with friends [May Select]
 - With friends over a drink [May Select]
 - While working out with friends [May Select]
 - When I'm at a party or event with friends [May Select]
 - I do not listen to music with friends [Reject]
- 15. How often do you listen to music together with other people? (Select all that apply)
 - Never [Reject]
 - Yearly [May Select]
 - Once a half year [May Select]
 - Once a quarter [May Select]
 - Monthly [May Select]
 - Weekly [May Select]
 - Everyday [May Select]
- 16. Have you created a playlist in which multiple people can collaborate and edit on Spotify? (Select all that apply)

- I do not collaborate music with friends [Reject]
- I only create playlists alone [May Select]
- I have created a collaborative playlist together with 1 - 2 people [May Select]
- I have created a collaborative playlist together with 3 or more people which they can edit [May Select]
- I have created a playlist together with friends, but they do not have the ability tot edit it [May Select]

Spotify Non-Collaborative Playlist Users

Screener

1. You need to sign a non disclosure agreement (NDA) to participate in this study. If you do not want to sign an NDA, please select "No, I do not agree" below. The link to the NDA will be the first task in the study. If you complete the study without signing an NDA your test will be deleted and you will not be paid. Are you willing to sign an NDA to take part in this study
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 - I'm not sure [May Select]
 - No, I do not wish to sign an NDA [Reject]
2. For this study, you will need a computer with a webcam. Are you willing to show your face during the study?
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 - I'm not sure [May Select]
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 - I'm not sure [May Select]
 - No, I do not wish to present my screen [Reject]
4. How long have you been using a smartphone?
 - Less than 6 months [Reject]
 - 6 - 12 months [Accept]
 - 1 - 2 years [Accept]
 - 2 + years [Accept]
5. Thinking about your smartphone, can you tell me which of these best describes you?
 - (a) I understand smartphones very well, I could even build an app. [Reject]
 - (b) I'm confident using a smartphone. I can usually figure out new apps. [Accept]
 - (c) I'm confident using the apps I know, and I don't mind trying new apps, but sometimes I get confused. [Accept]
 - (d) I only use apps I know well, I don't feel confident using new apps. [Reject]
 - (e) I'm not confident using my smartphone, I wouldn't know how to download a new app. [Reject]
6. What's the make of your smartphone?
 - iPhone [Accept]
 - Android [Accept]
 - Windows Phone [Reject]
 - Other/Don't know [Reject]

7. Which of these moments in your life do you most often find yourself listening to music? (Select all that apply)
- When I'm getting ready for the day [May Select]
 - On my commute to work [May Select]
 - At work [May Select]
 - At home while doing housework [May Select]
 - When I'm driving / when I'm in the car [May Select]
 - When I'm hanging out with friends [May Select]
 - While working out (at the gym, running etc) [May Select]
 - When I'm at or hosting a party or event [May Select]
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 - There's artists I really love - I go to their shows and seek out their latest stuff [May Select]
 - I'm obsessed with my favourite artists - I know everything about them! [May Select]
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- Amazon Music [May Select]
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 - iTunes [May Select]
 - Pandora [May Select]
 - Soundcloud [May Select]
 - Spotify [Must Select]
 - Tidal [May Select]
 - Youtube [May Select]
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- Never [Reject]
 - I have only used Spotify from my friends'/family's account [Reject]
 - Less than a month [Reject]
 - Less than a year [Reject]
 - 1-2 years [Accept]
 - 2+ years [Accept]
11. For Spotify (or the most used digital service you selected), do you currently pay or use the free service?
- Pay [Accept]
 - Free Service [Accept]

- Do not use [Reject]
- 12. Which of the following things do you regularly do on Spotify (or your most-used digital service)? (Select all that apply)
 - Search for artists and listen to their music [May Select]
 - Browse and listen to genre and mood playlists made by Spotify [May Select]
 - Browse and listen to personalised playlists (example: Discover Weekly) [May Select]
 - Browse and listen to playlists made by friends [May Select]
 - Make my own playlists [May Select]
 - Listen to my own playlists [May Select]
 - Make playlists with friends [May Select]
 - Listen to Radio [May Select]
 - Save/Favorite songs, albums or artists [May Select]
 - Send music to friends [May Select]
 - None of the above [May Select]
- 13. How often do you normally listen to music?
 - Never [Reject]
 - Less than once a month [Reject]
 - Monthly [Accept]
 - Weekly [Accept]
 - More than once a week but not every day [Accept]
 - More than an hour every day [Accept]
- 14. Which of these moments in your life do you most often find yourself listening to music with friends? (Select all that apply)
 - When studying with friends [May Select]
 - On a roadtrip with friends [May Select]
 - With friends over a drink [May Select]
 - While working out with friends [May Select]
 - When I'm at a party or event with friends [May Select]
 - I do not listen to music with friends [Reject]
- 15. How often do you listen to music together with other people? (Select all that apply)
 - Never [Reject]
 - Yearly [May Select]
 - Once a half year [May Select]
 - Once a quarter [May Select]
 - Monthly [May Select]
 - Weekly [May Select]
 - Everyday [May Select]
- 16. Have you created a playlist in which multiple people can collaborate and edit? (Select all that apply)

- I do not collaborate music with friends [Reject]
- I only create playlists alone [May Select]
- I have created a collaborative playlist together with 1 - 2 people [Reject]
- I have created a collaborative playlist together with 3 or more people which they can edit [Reject]
- I have created a playlist together with friends, but they do not have the ability tot edit it [May Select]

D

User Testing Protocol

Structure

Introduction | 10 min

Provide context into the observation

Demographics | 10 min

Some information about the participant.

Observation Session | 35 min

Think-aloud protocol to observe people when interacting with the new collaborative playlist design.

Debriefing | 5 min

Thank you thank you!

Target groups

Group 1: Non-Spotify users

The reason for including this group is to ensure that the data will be collected from those who aren't and have not been familiar with Spotify. In this way we can find the problems with the design that might not occur to current Spotify users.

Group 2: Spotify Collaborative Playlist Users

The reason for studying current collaborative playlist users is to understand how and why they are using the feature as well as how they react to the new design.

Group 3: Spotify Non-Collaborative Playlist Users

The reason for including the non-collaborative playlist users is to first, understand why they are not using the functionality and secondly, how they will react to the new design without being biased by the familiarity with the previous version of the collaborative playlist.

Introduction – 10 min

Welcome

About us

- Thank you for taking the time to meet with us today.
- I am X and this is X
- We are working as Master thesis interns at Spotify in the Gothenburg office here in Sweden.
- Our thesis project focuses on how to create playlists together with friends and how to collaborate within this playlist.

Assignment

- In this session we would like you to interact with a design prototype and get your feedback on what you think about the design and how you experience it.
- You will be given a few tasks and questions while you are interacting with the prototype. As you explore the design, it is important that you think out loud. You can do that by describing why you are doing something or what you like and dislike as you are doing it. This is for us to understand what you think and how you feel when using the app.
- There are no right or wrong answers here, so feel free to be honest with what you feel. The important thing for us is to understand how you experience the prototype.
- Also note that we didn't have any part in this design, so your comments are neutral to us. You don't have to feel as if you are hurting us in any way if you do not like something.

Session

- This session will last about 60 minutes
- I will be the one holding the session and she will be taking notes but might also add some questions if she has any.
- You have the right to stop the session whenever you want, so just tell us!
- The session will be recorded and observed by us. All the recordings and opinions shared are confidential and anonymous, and will only stay within the project team for 30 days. The reason for collecting them is so that we can understand your feedback better and derive conclusions from it.
- Did you sign the NDA?
 - First name and last name?
 - Look through NDA
 - If not okay:
eu1.documents.adobe.com/public/esignWidget?wid=CBFCIBAA3AAABLbIqZhD0SbXuP3_MPikDchNZEEmmRmb-1WI-k0yzK8ozoS900bLs3GzRTxoUIPsTMpE-Qd9U*
- Are you okay with that?
[Confirm the session is on Zoom and being recorded]
[Confirm that the screen is presented]

[Confirm that the camera is on to capture reactions]

- Do you have any questions before we start?

Demographic – 15 min

Warm-up questions

About the participant

- Tell me a bit about yourself...
 - What is your name?
 - How old are you?
 - Where are you from?
 - Where do you live?
 - Do you live alone?
- What do you do for a living?

Phone usage

- How many years of experience do you have of using a smartphone?
- What kind of smartphone do you have? Android or iPhone?
- If you download a new app, do you usually need help from others to understand it?

Music listening

- What type of music do you usually listen to?
- Do you use a music service to listen to music?
[If yes:]
 - Which one do you use?
 - How long have you used it?
- Have you heard about Spotify?
- States you do not need it

Collaborative playlist

- Spotify has a function where you can share playlists with others. In these playlists you and your friends can add, delete and reorder the tracks in the playlist. Have you heard about this feature before?
[1. If yes:]
 - Have you ever used this feature?
 - Is it something you use often?
[1. If no:]
 - Would you like to use such a feature?

Observation – 40 min

About observation

- We will now start to play with the prototype. We will give you a couple of tasks for you to complete in the prototype.
- This will work by giving you one task at a time, and after each task we will stop to discuss them. Then continue to the next and ask questions about that one.
- Have in mind that this is only a prototype, so it is not a full-developed Spotify app. You will therefore not be able to use the prototype as you would have with a regular app, meaning that all buttons may not work and you maybe cannot scroll as you usually do.
- Please do not feel any pressure on completing the tasks. As we said, we are only interested in knowing how you feel and think around these tasks.
- We would therefore appreciate it if you could tell us out loud what you are doing and what you are thinking while interacting with the prototype.
- We will probably ask you some questions about what you are thinking and why you are doing something as we go.

Scenario 1 – Thesis baby

Scenario description

Please imagine that your name is Colleen Bell and you are soon graduating. Your thesis partner Shane Black has created the perfect playlist for studying and has invited you to his playlist called *Thesis Baby*.

Task 1 - Accept invite to Thesis Baby

- *Open the Spotify app*
- *You should have received an invite to Thesis baby playlist. Please find this invite.*
- *Take a look at the playlist*
- *Accept the invite*

Questions

- *What was your experience of being invited to the playlist?*
- *Were the invitations placed where you would like to have them?*

Task 2 - Playlist

- Look through the playlist list

Questions

- *Could you describe the content of this view?*
- *What do you think the images under the playlist name means?*
 - *If you click the face piles, could you now describe what they mean?*

- *Can you describe the content of this page?*
- *What is the difference between followers and collaborators?*
- *What do you think the images next to the song (listeners) means?*
 - *And if they jump around?*

Task 3 - Suggest songs

- *You would like the song Helicopter to be added to this playlist within the playlist.*

Questions

- *Why do you think you could not add a song directly to the playlist?*
- *How do you think your suggested songs will end up in the playlist?*
- *What do you believe the information in the suggested songs list means?*
 - *Can you describe what you are allowed to do in this playlist?*
- *How do you feel about this feature of suggesting songs?*

Task 4 - Hide songs

- *You see the song Everything Now in the playlist and want to listen to it.*
- *While listening to it, you figure out that you do not like this song and would want to remove it. Please do it.*

Questions

- *What do you think will happen once you click the hide-button?*
- *Is it something you would like to use?*
- *How do you feel about this feature of hiding songs?*

Task 5 - Hidden songs

- *Go back to the playlist.*
- *How can you have this song played for you again?*

Questions

- *Do you notice any difference in the playlist?*
- *Why do you think the song is grayed out?*
- *How would you be able to listen to it again?*

Task 6 - Leave playlist

- *Now you have figured out you no longer like to collaborate on this playlist. Please remove yourself as a collaborator.*

Questions

- *What do you think it means to stop collaborating in a playlist?*
- *What do you think it means to stop following a playlist?*

Additional questions

- What was your overall experience with this feature?
 - Was there anything that felt confusing?
- Is it something you would like to use?
- Have you anything else to add about this feature?

Scenario 2 – Party o'clock

Scenario description

You are planning to have a graduation party with your class. You therefore want to create a nice playlist where all of your classmates can add, remove and listen to songs.

Tasks 1 - Create a collaborative playlist

- *Show us in the app how you would create such a playlist with your friends.*
- *You would like to invite Max by his username “maxy”.*
- *You decide that Max should be able to add songs to the playlist and invite other people to join.*

Questions

- *How did you find this process?*
- *These three permissions do not exist in the current version, how do you like having different permission settings for collaborators?*
- *What do you think the three different permissions implies?*
- *Would you have liked another permission as well?*

Tasks 2 - Remove a collaborator

- *You saw that Brooklyn Williamson have added a lot of songs that you do not enjoy, and you want to remove her as a collaborator.*

Questions

- *How was the process of removing a collaborator?*
- *Would you like to do this in another way?*

Tasks 3 - Accept the suggested song She Said

- *So now some of your friends have started using this playlist and also suggested a few songs. Accept the song suggested by Gabriella to the playlist.*

Questions

- *What did you think about having the list of suggestions here?*
- *What did you think about having to accept the suggestions?*
- *Who do you think should be allowed to accept suggestions?*
- *What information can you retrieve from the suggestion-area?*
- *Have you anything else to add about this feature?*

Tasks 4 - Revert changes

- *Your favourite song “Starboy” has been removed from the playlist. You are not happy about this and want to know who removed it.*
- *Can you find a way to add it back to the playlist?*

Questions

- *How did you find this process?*
- *What do you think the information in the history list means?*
- *Who do you think should be able to revert actions?*
- *What would you think if someone reverted your actions?*

Additional questions

- What was your overall experience with this feature?
- Have you anything else to add about this feature?

[To collaborative playlist users]

- How does this design compare to the current feature?

Debriefing – 5 min

- Now the observation is done!
- Have you come to think of something else?
- Do you have any questions before we end?
- Thank you so much for participating, this will be very helpful for our thesis work.
- Your insights have been valuable for us.

E

Thematic Analysis Code Book

Music Usage

Music in the background

Music in isolation

Music as a social activity

Recommended list

Thinks recommended songs list is part of playlists

Too much text with recommended songs list

Public

People misunderstand what “make public” is

People understand what “make public” is

Understand the difference between collaborative playlists and the public playlists

Add/remove songs

Easy to add and remove songs

Removes song via “edit playlist”

Swipe to remove

Adds song to playlist in the playlist instead from the search view

Demand for adding multiple songs at a time

Others

Do not like context switching

Unequal collaboration

Context menu

Open context menu for a song by pressing it down for a few seconds

Browsing context menu to find settings of the playlist

Are the buttons in the context menu on or off?

Easy to miss the context menu button for a specific song

Playlist value

Playlist creation requires a lot of effort

Associate different playlist with different values

Recommendation

See playlist as a private things

Music through recommendation

Give music recommendation

Music inspiration when hearing a song

Music inspiration through a prepared playlist

Sharing music with friends and family

Don't recommend music to others

Don't want to find new music

Collaborative playlist creation

Create a playlist by finding songs first

Create a playlist before finding songs

Added songs before making it collaborative

Feedback signal should be improved in "make collaborative"

Difficulties understanding the meaning of "make collaborative"

Claim it is easy to create collaborative playlists after trying it for the first time

Mistakes "share" as making collaborative

Wants "make collaborative" to be under share

Want the collaborative playlist making and the invitation to be in one flow

Trying to make collaborative at the top of the playlist

Mistakes "make public" as collaborative

Trying to make collaborative via "more option" menu in a playlist

Trying to make collaborative through "edit playlist"

Choose share before making it collaborative

Misunderstands that collaborative playlist are public playlists

Followers

Browsing for followers in the context menu

Not important to see followers

Want to see a list of followers

Browsing for followers at the top of the playlist view

Browsing for followers in "share"

Identify followers by usernames of added songs

Browsing for the follower/list in the owner text "Michelle Tran Luu"

Browsing for the follower-list in "number of followers"

Invite

Difficulties inviting collaborators to collaborative playlists

Easy to share a playlist

Browsing for "add"/"invite" to invite collaborators

Desire more feedback signals when inviting collaborators

Invite methods

Sharing through social media/email

Sharing within Spotify

Sharing by phone number

Name for collaborative playlists

Name for collaborative playlists:
Sharing / shared playlist

Refers to collaborative playlists as
“collaborative playlist”

Name for collaborative playlist:
“Collaborative playlist”

Save playlist

Download as to save the playlist

Easy to join a collaborative playlist
through a link

Misunderstand follow-button

Difficulties understanding the heart
symbol / like button in iOS

Follow the collaborative list after
opening the first time

Wants an invitation request to a
collaborative playlist to accept or
decline

Understands follow-button

Understands that they have to follow
the playlist to keep it

Don't want the invited playlist to be
saved in your library automatically

Icons in playlist have different
affordance, download more visible
than save in iOS

Prefers “follow” over “like”/hear iOS

Difficulties saving playlists

Feedback signals in saving playlists

Indications of collaborative playlists

Claim that it is not necessary to see
which ones are collaborative

Difficulties identifying types of the
playlist in Your Library

Don't care if there is an indication
that it is a collaborative playlist

Wants to be sure which playlist is
shared

Mistakenly identifies a collaborative
playlist as a playlist with a green
download icon in Your Library

Manually check “make collaborative”
to find out whether or not it is
collaborative

Wants an indication in a playlist that
it is collaborative

Desire to see the type of playlists in
Your Library

Settings

Clicks “settings” in Home to invite to
the collaborative playlist

Clicks “settings” in Home to create a
playlist

Difficulties finding where to create
new playlist

Awareness

Not important to get updates

Unaware of changes

Noticing changes in playlist in real-time

Is able to identify which song is added by whom

Difficulties identifying which user has added a song

Want to be aware of changes

Potential use cases

Collaborative playlists for a specific purpose

Use a collaborative playlist to help each other create a larger music collection

Use a collaborative playlist to help each other discover music

Use a collaborative playlist with people who know your music taste

Use a collaborative playlist with people of same music taste

Collaborative playlist with a specific type of music

Want vs not want

Want to have a collaborative playlist by just listening to it

Want to use collaborative playlists

Used collaborative playlists with themselves

Can use collaborative playlists but it is not a priority

Rather Use a completed or public playlist instead of a collaborative one

Don't want to use collaborative playlists due to not having similar music taste as others

Don't want to use collaborative playlists

Want to make a copy of the collaborative playlist instead of using it

Willing to listen to bad songs

Unwilling to listen to bad songs

Want to listen to own songs not others

Permissions

Desire full control of own playlist

Remove from oneself without affecting others

Wants to be able to control own actions

Unwilling having others edit own playlist

Irritation when someone removes songs

No one can remove songs

Afraid of unintentional change in collaborative playlists

Suggest changes to playlists

Only accept invitations when there is a consensus

Limited invite control

Don't want everyone to have access to a playlist

Unwilling to edit others playlists

Would like to understand why a song is removed

When collaborators invite people to playlist owner should get a request

All collaborators should be able to invite others

Only add when there is a consensus

Only delete when there is a consensus

Equal permission between host and guest

Admin can set different permissions on collaborators

Wants to be able to restrict types of songs in own playlist

Collaborators can add songs but not remove