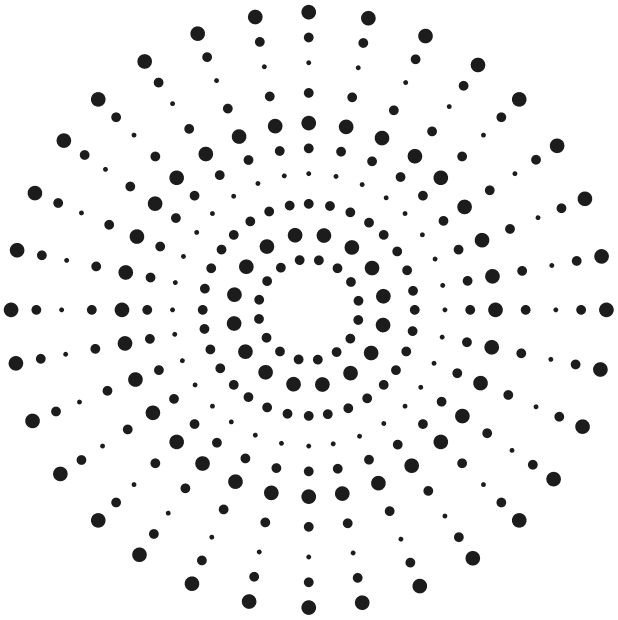
Bachelor Thesis

# SONIC SURFING



Kilian Ettlinger

# An auditory approach on how to create a feeling of connectedness in lonely moments

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**Typeface: Favorit**

My biggest thanks considering the support during my project goes to my main mentors Prof. Dr. Karmen Franinović and Luke Franzke.

With their knowledge about my targeted topic I received compelling inputs on how to develop my project further and come up with a meaningful concept that supports the relevant aspects. Next to that I got the technological support I needed to finally realize my prototype.

However, I want to thank all the other mentors included in the process of our bachelor project, who gave further feedback and inputs that I was able to consider for my project.

A big thanks also goes to all the participants that conducted my cultural probes and experiments that helped me to get my main findings.

Without having the exchange and feedback from my social environment, which were a main part of my target group, I wouldn't have been able to develop a relevant process and outcome.

Isolation – one of the most frustrating conditions of our times. Everyone has been forced at least once to stay within their own four walls due to the current pandemic. Isolation can lead to loneliness and loneliness can ultimately cause further damage to one's health.

With my Bachelor Project I explored how loneliness feels and how this feeling can be reduced.

I focused on an auditive approach and based on my research developed an auditory tool that helps people in a lonely situation to receive a feeling of connectedness by creating an immersive environment.

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# RESEARCH FIELD

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## ISOLATION & LONELINESS

1.1 As we are currently in a pandemic, the issue of isolation is very topical and also very close to society, which allows me to tackle an issue that affects or has affected most people. The circumstances and measures required by the pandemic are a heavy psychological and also physical burden on people. We've either have been forced to stay in isolation to endure a quarantine situation, to work from home, or due to other safety measurements. But there are other situations that can put us into self-isolation such as mental and physical health problems, language barriers, unemployment, or even the excessive use of social media can decrease the social connection. (Choukér & Stahn, 2020)

Those who find themselves in isolation enter a perpetual vicious circle into which they slip further and further. If you spend a long time in isolation, you will eventually feel lonely, and this loneliness over a long period of time can have negative effects on your mental and physical state.

Feeling lonely can be very frustrating, you get tired easier, feel unhappy at times, and eventually don't bring the energy to perform as usual. But the consequences can be even more fatal. Loneliness is said for example to be more harmful than 15 cigarettes a day and to shorten life expectancy enormously.

It is also associated with depression, anxiety, a higher rate of suicide, and increases the risk of diseases such as dementia. (Campaign to End Loneliness, 2018)

# EPIDEMIC OF LONELINESS?

**1.2** Various research papers and web articles claim that we are currently striving towards an epidemic of loneliness and our societies get lonelier and lonelier. People in rich countries tend to live alone and independently more often, which must mean they get lonelier, too.

Another claim that is based on a statistic says that younger people nowadays are lonelier than older people. Explaining that loneliness depends on the generation.

Generally, in terms of percentage, it is true that younger people feel lonely more often than the other age groups. But this doesn't rely on the generation they were born in, but on the age in general. It has shown that people of older generations felt lonelier as well when they were at a young age. Interestingly, loneliness has even decreased over the last centuries. Therefore it is safe to say that we aren't living in an epidemic of loneliness. Nevertheless, due to the current pandemic, lonely moments may occur more frequently in these times, than they did before the topic of social and physical isolation was even common in daily life.

(Ortiz-Ospina, 2019)

# SOLITUDE

**1.3** What also needs to be considered is that someone doesn't have to feel lonely for being in isolation or alone. Probably every human needs some time for themselves to either focus and concentrate on a specific topic or just to reflect and regenerate the physical but also social energy.
At the same time, someone might feel lonely even when being in a social context, while meeting friends or visiting a social event, since they can not connect with others due to various barriers, and the feeling of togetherness is not satisfied.

# «Because measuring loneliness is not as simple as measuring blood pressure or blood sugar levels. Loneliness is a state of emotion and our subjective interpretation of our lives»

**explains Dr Debanjan Banerjee, Senior Resident – Department of Psychiatry, National Institute of Mental Health and Neurosciences, Bengaluru.**

(Gitay, 2019)

# PSYCHOLOGICAL BACKGROUND

**1.4** Loneliness comes in different shapes and forms and is yet hard to grasp in single sentences to me. To have a wider spectrum of background knowledge I wanted to dive also into the psychological aspects of the lonely feeling. There have been different proposals made on how one can perceive and interpret the feeling of loneliness.

One approach is by Jesse Prinz who argues that emotions are perceptions of bodily change that have specific functions and capability. Fear is therefore the perception of a racing heart, which is triggered by danger signals, and eventually motivates avoidant action. (Prinz, 2004)

Another perception on the illustration of the experience of loneliness was advocated by Cacioppo and Patrick that loneliness is "social pain". In this case loneliness responds to social isolation and triggers the brain to alleviate the current state of mind. (Cacioppo, Patrick, 2008)

The most interesting way to look at loneliness in my opinion, was proposed by Roberts and Krueger. They understand the state of loneliness as the experience of an absent social good. This explanation makes sense to me, since when a good of a person is out of reach, the person might be missing it. (Roberts, Krueger, 2020) The term social good in this case can be referred to the presence of companion- and friendship. If we link this matter to social context and view a social good as the social connectedness of a person in societal structures, we can claim that the absence of these social goods result in the occurrence of loneliness of an individual. (Seemann, 2022)

# THREE DIMENSIONS OF LONELINESS

**1.5** Due to loneliness being a complex construct, there have been different approaches and perspectives on how to make sense of loneliness in societal structures. One of them are the three dimensions of loneliness, which split the construct into three different dimensional layers. Defined as intimate loneliness, social loneliness, and public loneliness.

(Cacioppo et al., 2015)

## INTIMATE LONELINESS

**1.5.1** The perceived absence of a significant someone. That is, a person one can rely on for emotional support during crises, who provides mutual assistance, and who affirms one's value as a person.
It is said that having an intimate partner that one can emotionally rely on, the feeling of intimate loneliness can be reduced. By Dunbar it is defined as the «inner core», a small circle of the closest social environment.

(Dunbar, 2014)

## SOCIAL LONELINESS

**1.5.2** Social loneliness, also known as rational loneliness, refers to the perceived absence of quality friendships or family connections.
It defines a person's valued social identities or active network (e.g. group, school, or team) in which an individual can connect to similar others at a distance in the collective space.
Dunbar suggests that this group he refers to as «sympathy group» can consist of 15-50 people including core social partners with whom we interact regularly and from whom we can obtain high-cost support (e.g. loans, assistance with projects, child care).

(Dunbar, 2014)

## COLLECTIVE LONELINES

**1.5.3** Refers to a person's valued social identities or «active network» (e.g., group, school, team, or national identity) wherein an individual can connect to similar others at a distance in the collective space.
This social layer, which Dunbar described as the outermost layer, includes between 150 and 1,500 people who provide information through a social network as well as low-cost support like voluntary work.

(Dunbar, 2014)

# CONNECTING TOOLS

**1.6** We have also learned how not to feel lonely in isolation. The advancement of our technology enables us to communicate and exchange with each other in many different ways. With social media, various communication platforms with different functions and features have emerged and people are connected everywhere. Depending on which medium you use and to what excess, social connectedness can be strengthened, but one can also quickly feel even lonelier.

Popular connective technologies are designed to be efficient, not to be meaningful. Usually, the accessible communication options of our society are very two-dimensional through audio-visual inputs and outputs, which, depending on the internet connection are not really given and thus do not necessarily promote the connection of the people exchanging. Moreover, one is alone and isolated again as soon as the laptop is closed.

That's why I don't really want to go too much in the direction of social community platforms and more likely create something more immersive and experienceable to create a space that goes further than the screen and reaches a next level of social presence.
A creative approach to reduce the feeling of loneliness.

# With my Bachelor project, I want to help lonely, isolated people to experience a sense of belonging and togetherness, even when alone.

## HYPOTHESIS

1.7 Everyone at a certain point experiences loneliness. Even if it's just by eating alone in the evenings while living alone, or over a longer period of time due to for example a chronic physical burden. That's why I don't want to specify on a specific group, but rather try to develop a creation anyone in our society can benefit from. Everyday life in isolation can be very frustrating and I wish to find a method that can provide relief. Instead of just trying to bring people together and create community bounding, I want to tackle a different approach and try to find a solution to overcome loneliness at the moment one feels lonely and can't immediately connect with someone else face to face.

I chose a quite specific environment to investigate further, which is the auditory space. During my field research I have come to different points which prove that auditory communication, music and sound in general promotes a sense of a social situation and reduces the feeling of loneliness and isolation. That is why I want to focus on auditory technologies and methods in an immersive, explorative way, but more detailed information to that in the following paragraphs.

# AUDITORY APPROACH

**1.8** During my recent desk research I have found two different points, which I took in consideration to make the statement to tackle the problem with an auditory approach.

The first one is the fact that music and sound in general can reduce the feeling of being alone while actually being alone. Sound can make one feel as if in a social environment, since social spaces are usually quite filled with sound, due to humans making noise while socializing with each other. A specific lyric of a song can as well make the listener feel less lonely, when able to relate to the words said, or even the pure atmosphere that the track translates. This is for example also a reason some people leave the TV on in the background while doing something for themselves. (Taylor, 2021)

The second point is based on digital communication tools, which I mentioned before is the direction I don't want to strive too much into, but the found information can still be taken in consideration while exploring the field.
The communication tools thought of to be most convincing in delivering a feeling of social togetherness are especially visual but also auditory platforms.
Voice and video chats, for example, have a higher social presence than text messages or other social media communication. Voice calls have been shown to build a stronger emotional connection with the person on the other end, as people focus purely on the voice and what is being said. There is less distraction of other things, which can quickly happen in a video call due to the screen that offers countless distraction possibilities. Additionally, I find that audio allows to fill a space, which leads back to the statement of sound having the ability to simulate a social environment. (Nguyen et al., 2021)

# RELATED WORKS

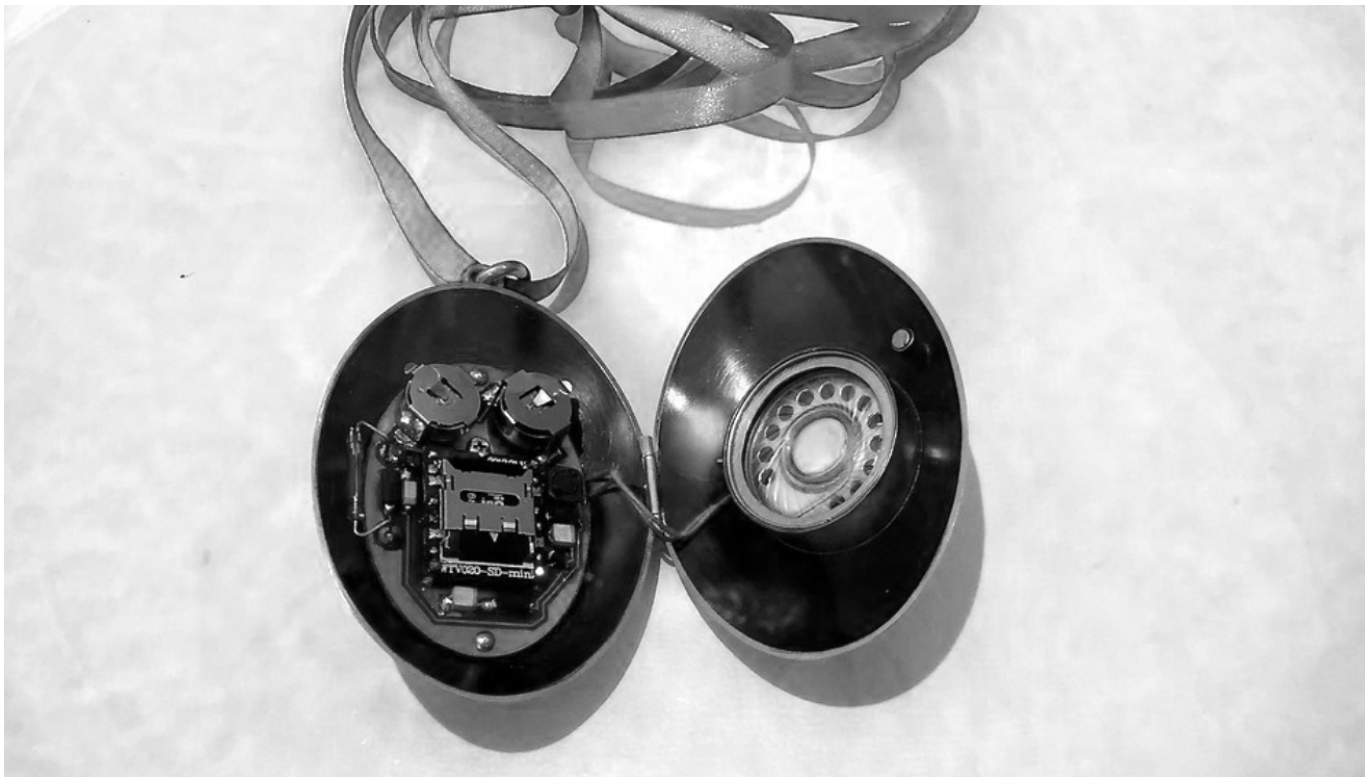
2

## VOICE OF BLUE

**2.1** Voice of Blue is an interactive locket created by the artist Natasja Boezem. Usually lockets hold a little image of something with importance to the holder. In this case, the locket plays a personal sound when opened. The sound can be self recorded and therefore could as example the voice of a loved person singing or laughing. This enables an even more personal connection to the locket and creates a greater feeling of connectedness than a two-dimensional picture.

I enjoy the idea of carrying a little artifact that allows you to experience something very personal when the situation calls for it. It's a simple approach to reduce someone's loneliness with sound.

(Boezem, 2014)



(Fig. 1)

# WOOJER

**2.2** Woojer is a corporation that develops gadgets that allow the user to immersively feel the sound they are listening to.
They produced a «vest» and a »strap» yet, which both let you dive into the environment by using low frequencies pumping through the whole body.
Their gadgets can be used for movies, video games, music in general, etc. creating a fascinating audio experience. It is even said to create something like an outer-body experience.
What I enjoy about this project is that the feeling of sound was taken to another level and they not only tried to stimulate the hearing senses but rather the sensory stimulation of the whole body.
For my Bachelor project I imagine trying similar experiments that let you feel sound from a different angle and make the experience even more personal.

(Woojer, 2022)


(Fig. 2)

# N'TOO (NOT THE ONLY ONE)

**2.3** Not The Only One is a project by Stephanie Dinkins, displaying an artifact with a built in artificial intelligence. The AI was fed with conversations of three black women of three generations from one family. These conversations focused on what these women lived through on their historical background. The AI was trained and aligned with the needs and ideals of black people who are drastically underrepresented in the tech sector.

The artifact shows the faces of each of the three women on the sides of the memoir. In the exhibition, the audience was able to ask questions to the artifact, which then should be answered by the AI.

I think this project is quite valuable because the stories told by the women are very personal and emotional, which is usually not expected from an AI. When it comes to loneliness, people don't really want to talk about it, or admit it when they feel lonely.
With this approach, indirect conversation might help to be more open about loneliness and promote connectedness to others that can relate.

(Dinkins, 2018)

(Fig. 3)

# POSITIONING

**2.4** With my desk research and the analysis of related works I let myself strive into a direction that already fixes a few points for my project. The auditory environment will be my main focus to create the experience I am going for.

The project should develop around the immersive experience of the human and therefore stay human-centered.

What is not so clear yet and will probably show during further investigation in the field is if it's rather going to be an analogue or digital solution. This also raises the question if I rather want to go towards a spatial, immersive installation or more likely in the direction of an artifact or gadget. As well I could imagine in the end to have a methodological framework developed that is more of a guide to overcome loneliness, when alone.

# RESEARCH QUESTIONS

3

A personal desired part of this project is to dive into auditory tools and explore how they can be used in different ways.
I came up with two research questions that may accompany me during the process of the project.

# What experiences of social connectedness can be explored in the auditory space?

# How far can the functionality of auditory tools be pushed?

# METHODOLOGIES

4

## DESK RESEARCH

4.1 There is still a lot I need so find out about the topic of loneliness. I want to investigate the psychological aspects of loneliness and want to see how therapeutic treatments at the moment are constructed, to have a better image on where to find solutions.
Additionally I need to really dive deep into the technological aspects, especially auditory technologies and mediums. For that, desk research is very valuable and I expect to be able to really push further with my idea when I've found more specific learnings.

## INTERVIEWS / SURVEYS

4.2 Interviews will be important to get specific information on how people perceive loneliness and what helps them overcome it.
As I mentioned in the beginning, the situation of someone being lonely can vary a lot from human to human.
Since I don't want to focus on a specific target group and include anyone who ever experienced loneliness, it will be useful to get as many personal opinions as possible. On the other hand, to get a broader range of opinions surveys will be used for more factual information.

## CULTURAL PROBES

4.3 Since my project will focus on people that are alone, cultural probes help to feel connected even when doing something for oneself.
The participant is able to do something alone in isolation, which wouldn't work as well with methods where I would have to be present and e.g. give instructions, since the tester wouldn't be able to let themselves simulate and experience a lonely situation.

I had the notion of people exchanging personal objects or things in general to enhance the interconnection with each other, by having to spend time and interact with the other participants' personal objects.
With this method, I could recognize what is valuable to us to feel connection, when lonely. For that, I already created a little prototype, which I will talk about in the following section.

## PROTOTYPING

4.3 The core methodology to get closer to the realization of the final outcome will be the prototyping and furthermore testing of these prototypes.
I will also use diverse prototypes to get further with my theoretical investigation. These prototypes should be mostly set up in an experimental way, to explore each factor that might be beneficial for the goal.
These experiments could be super quick, low-fidelity prototypes that use different sound frequencies, sound systems, and the sense of hearing in general in correlation with the interconnectedness of people, to push further.

# SOUND BOX

**4.4.1** As a first prototype I tried to create a cultural probe based on the related works and what I have researched in the field.
For this cultural probe I asked two friends that currently feel lonely quite often due to still working in the home office for most of the week. These friends actually knew each other, so I wanted to keep them anonymous to not let the friendship have a bigger influence.

I told the 2 participants to create a playlist with the songs they like to listen to when they feel lonely. Then I created a little box for each one with a scannable link of their playlist inside. The box of each one was then exchanged and given to the other person. The idea was that whenever they feel lonely, they could listen to the playlist created by the other participant. By that, the goal was to experience a certain connectedness to the other person, by hearing sounds that are quite intimate and personal to the other one, and therefore feel less lonely.

(Fig. 4)


(Fig. 5)

The feedback I got in general was that the interconnectedness between those two participants could be strengthened by creating a more personal situation. Such as the «Voice of Blue» locket, which plays a very intimate sound when opened. Another point that could enhance the interconnection would be by creating something «live», so that the users for example know when the other one feels lonely and needs connectedness.

The participants mentioned that it was nice knowing that something personally was created specifically for the cause of them feeling lonely. At the same time they might help someone else that experiences the same situation, and knowing that one is supporting another gives a warm feeling and solace in general.
Despite that, they said it isn't much different or more personal from just listening to a friend's playlist on Spotify, and that's probably the point where the interconnection should be further improved.

# CONCEPT

5

We live in a modern world where we want to achieve our goals independently and each lives individually. Yet, we are connected at all times, and when we are not, we look for connections to not feel lonely. Even if we go towards a society of aloneness, we never really get to have a moment for ourselves. Everything has to happen faster and faster and we want to be entertained at all times. We strive towards fulfilling the ideal social embeddedness and when we don't achieve it, we feel a certain disconnection to society and eventually get lonely.

## MOTIVATION

**5.1** Isolation is something that affects everyone at one time or another, including me. During my studies, we spent a lot of time in the home office because of the pandemic. There were days and even weeks when I felt very mentally drained and I'm pretty sure it was because of the constant isolation. Since I often work as a freelancer, I will probably spend a lot of time in isolation in the future.
Of course, I have my own methods to overcome loneliness. However, these are rather banal and I would like to view the whole situation from a different perspective and thus find a more specific approach to the problem.
The auditory approach on one side comes of course from the fact that sound can help loneliness, but I also have a strong personal interest in diving deeper into the technologies of audio and developing my personal skills in that area.

## INTENDED CONTRIBUTION

**5.2** There are already various solutions for overcoming loneliness. I know that I am not reinventing the wheel with my project, but I hope that I can create something that helps to overcome the situation of loneliness in a playful and experimental way.
My project is not meant to save the world, but to bring relief in difficult times. I want to give people something to hold on to, a spark of hope when they feel lonely and isolated.

In this chapter I will explore the societal structures of loneliness to find scenarios and situations in which loneliness happens and could be tackled with an approach for a possible solution. I started my first experiments in which I explored how sound and different frequencies have an influence on my physical and psychological health, to see what methods and strategies could be used for further steps on developing my own approach.

# HONNE

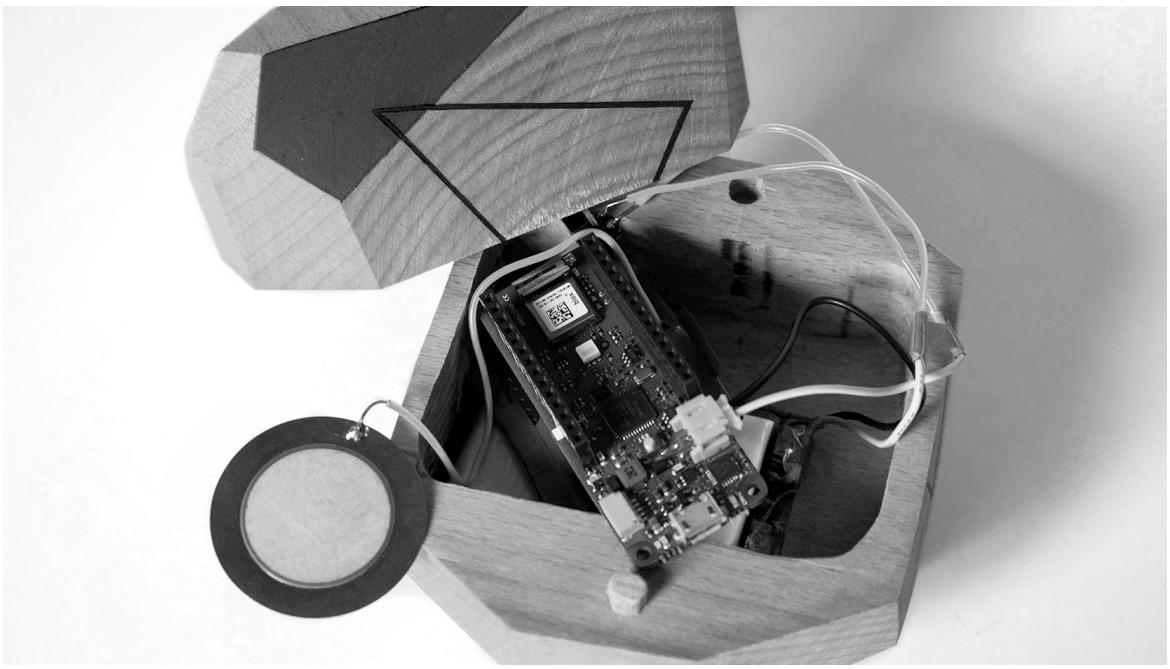
6

A project that I find quite inspiring in context of the goals I am trying to achieve with my prototypes is Honne. Honne is an interactive artifact that captures moments and meaningful experiences of solitude. Whenever the owner of a Honne artifact feels stressed or overwhelmed, they can hold the artifact and get back to that solitary moment. The artifacts are created on data that an app captures when the user wants to collect the solitary moment they are currently in. It enhances people to connect with their inner self when they are feeling overwhelmed and when they need to take a break from the world and reboot. Data about the location, weather, date, time zone, motion, heart and breathing rates are saved and will eventually decide the form and texture of the hand made artifact. Each user of the app may get their own personalized artifact. In addition, when the artifact is touched, it plays a sound that is also tailored for each user and resembles the atmosphere of the captured solitary moment. (Shumylo, 2019)

(Fig. 6)

## CONCLUSION

6.1 What I like about this project is that it's a tangible object that can be used in day to day life. The owner of the project may possibly feel overwhelmed or stressed at some time and pull out a tool that helps to overcome these feelings. Nevertheless I'm not sure how big the impact of the interaction of the artifact actually is. The user has to really think about the experience of solitude to get back into the moment, since the artifact itself doesn't essentially resemble a lot of hints on what that solitary moment looked and felt like. It's interesting that sound was also used to resemble a relaxing atmosphere. But I assume that the experience is not really immersive enough to have a bigger effect on the environment of the user. Apart from this, the project is only about embracing a solitary moment for oneself, which makes sense in this case, since it doesn't particularly focus on loneliness.
With my approach I also want to consider and promote the social connectedness of the user, to be able to make the feeling of loneliness more endurable.



(Fig. 7)

# INTERVIEWS

7

To grasp and locate loneliness in my close environment, I had a few conversational kinds of surveys with friends and family around me, where I asked some questions and noted what was said in the conversation resulting from them. I first asked how they'd describe the feeling of loneliness, when they feel lonely and what they do to overcome this feeling. An interesting following question was why they feel lonely, which really helped me to support my findings.
It has shown that usually an uncomfortable situation happens, that either saddens, stresses or overwhelms the person. This discomfort leads to disconnecting them from their relationships and environments, which then furthermore lead to loneliness.

Usually they don't have a big struggle to get out of this loneliness again. Mostly it happens naturally after that discomforting situation is over. But instead of just waiting through that feeling of loneliness, that time could be used to embrace the solitude and use the time for ourselves to grow, to then later-on have a clear and relaxed mind to move on.

What was interesting is that a lot of methods people use to reduce the feeling of loneliness and help them feel less alone already are auditively based. Some people for example said they like to leave the TV on when they work alone at home, or listen to podcasts when they try to fall asleep. Having sound in the background helps them to feel a certain presence, even when alone. I had to notice that the feeling of loneliness occurs differently for each person. I collected a lot of different statements and terms considering loneliness.

This also helped me realize that I couldn't go for a universal solution that works the same way for anyone experiencing loneliness.

# HOW TO DESCRIBE THE FEELING OF LONELINESS?

**7.1** As a starting question I wanted the participants of the interview to describe the feeling of loneliness in one word. The intention of this task was to make sense of what loneliness actually feels like. We know it's an uncomfortable feeling, but sometimes hard to grasp and understand.
A few examples of the answers were: «tiring», «empty», «unhealthy», «no energy», «frustrating»

# WHEN DO YOU FEEL LONELY?

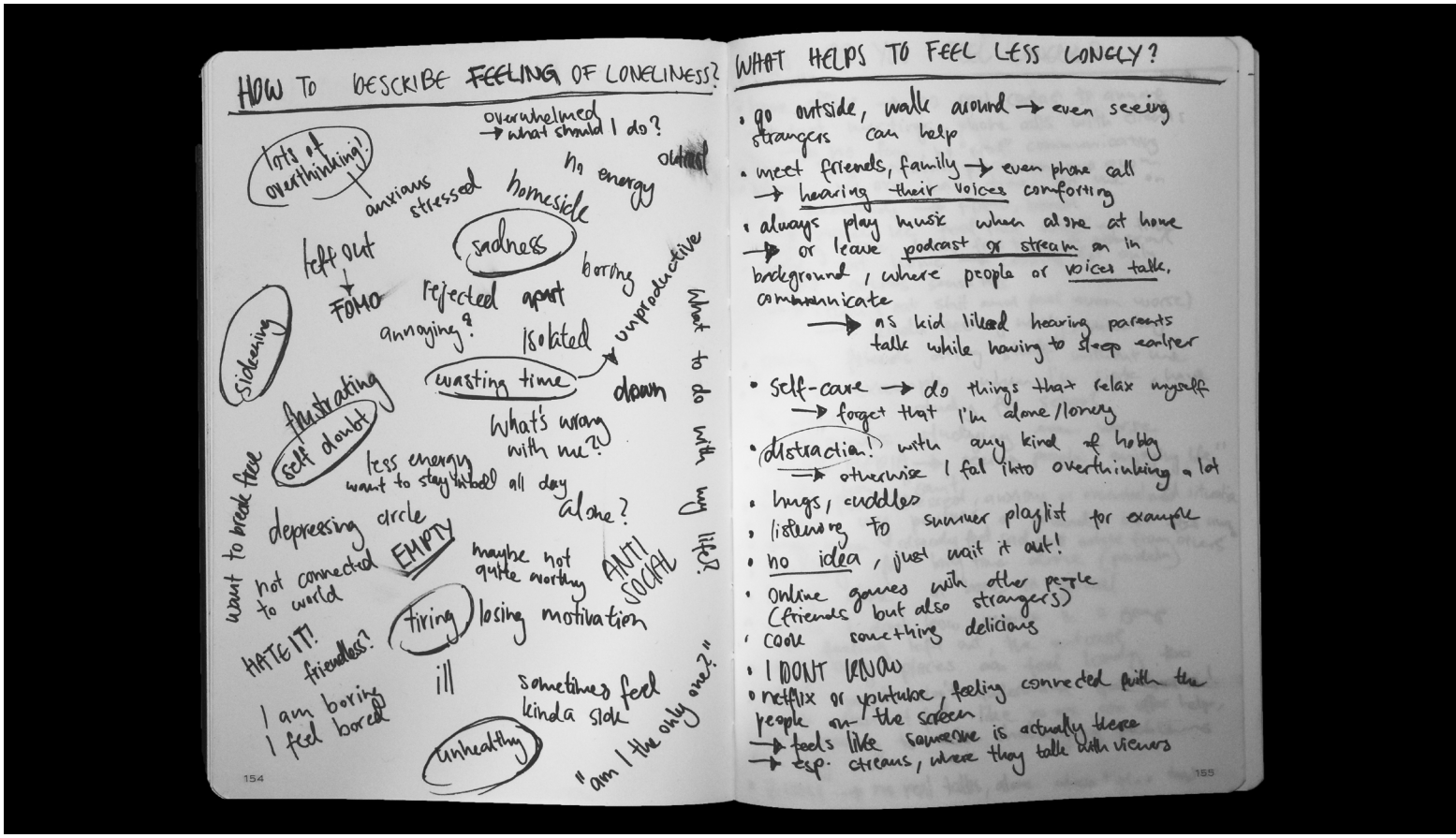
**7.2** This question was important to see in what moments people in my environment usually feel lonely. I thought maybe I could focus on a specific place, if I get the same answers more often. But most of these answers considering the feeling of loneliness vary from person to person. Often people feel lonely, when the close social environment isn't around, and the feeling is enhanced when a stressful situation occurs. This usually doesn't apply to a specific place, other than the ones that we're already obvious, such as living alone in a home office situation.
What do you do to overcome this feeling of loneliness?
With this question I wanted to see what options people already have and what methods they use to overcome the lonely feeling.

As I mentioned before, I already got quite a few answers that use sound as a tool to feel a bigger connectedness, which made me feel confident in the research approach I was going for.

# WHY DO YOU FEEL LONELY?

**7.3** This last question might be a bit more complex, but it considers a valuable aspect of how the awareness of loneliness in my social environment is. As I learned from my research, there are different definitions on how to explain why someone feels lonely or what being lonely even means after all. I was wondering what definitions I might get from people that might haven't put too much thought in the explanation of loneliness yet.

(Fig. 8)


HOW TO DESCRIBE FEELING OF LONELINESS?
overwhelmed → what should I do?
lots of overthinking!
anxious
stressed
homesick
no energy
oldest
left out
sadness
FOMO
rejected
apart
boring
unproductive
annoying?
isolated
sickening
wasting time
frustrating
self doubt
what's wrong with me?
less energy
want to stay in bed all day
alone?
depressing circle
not connected to world
EMPTY
maybe not quite worthy
ANTI SOCIAL
losing motivation
firing
HATE IT!
friendless?
ill
I am boring
I feel bored
sometimes feel kinda sick
unhealthy
"am I the only one?"
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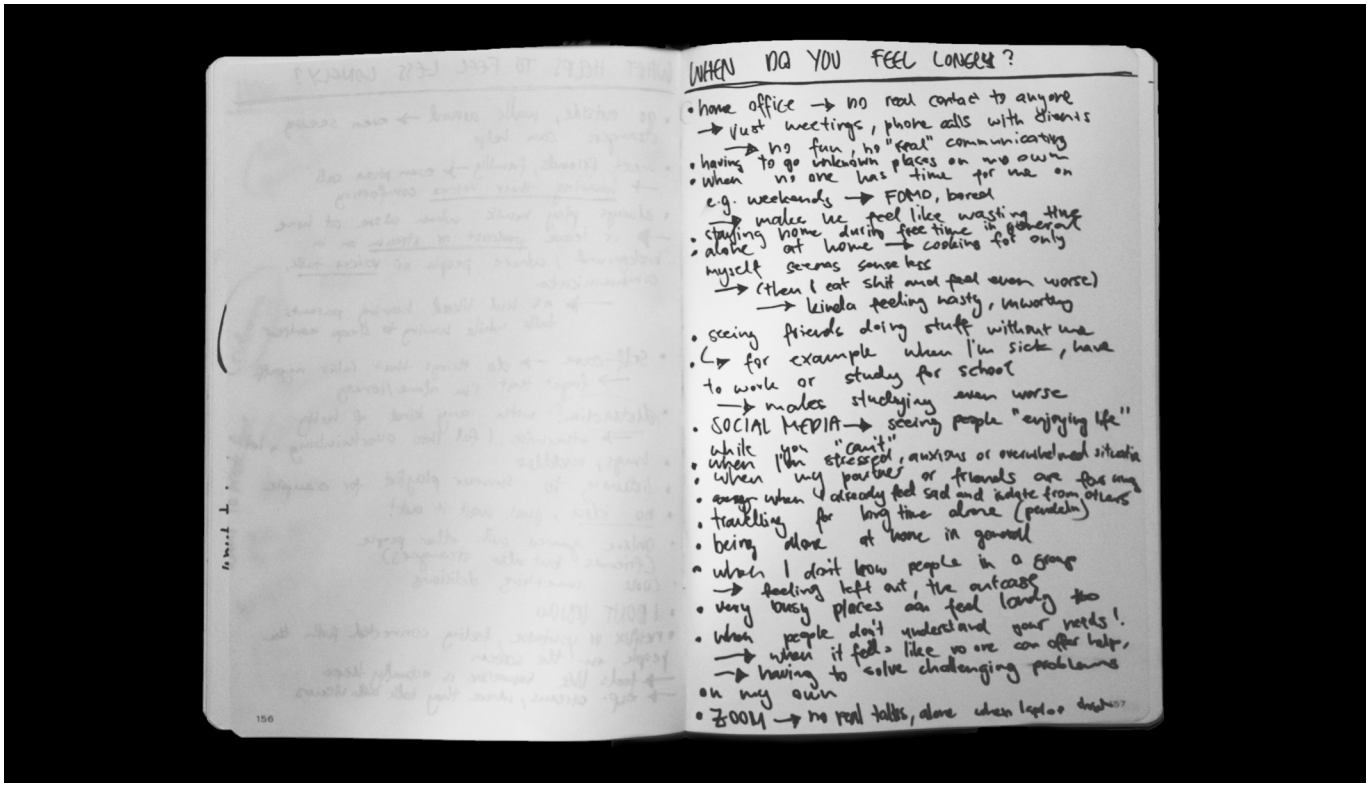
WHAT HELPS TO FEEL LESS LONELY?
• go outside, walk around → even seeing strangers can help
• meet friends, family → even phone call → hearing their voices comforting
• always play music when alone at home → or leave podcast or stream on in background, where people or voices talk, communicate → as kid liked hearing parents talk while having to sleep earlier
• self-care → do things that relax myself → forget that I'm alone/lonely
• distraction! with any kind of hobby → otherwise I fall into overthinking a lot
• hugs, cuddles
• listen to summer playlist for example
• no idea, just wait it out!
• online games with other people (friends but also strangers)
• cook something delicious
• I DONT KNOW
• netflix or youtube, feeling connected with the people on the screen → feels like someone is actually there → esp. streams, where they talk with viewers
155


WHEN DO YOU FEEL LONELY?
• home office → no real contact to anyone → just meetings, phone calls with clients → no fun, no "real" communicating
• having to go unknown places on my own
• when no one has time for me on e.g. weekends → FOMO, bored → makes me feel like wasting time
• staying home during free time is different
• alone at home → cooking for only myself seemes senseless → (then I eat shit and feel even worse) → kinda feeling nasty, unworthy
• seeing friends doing stuff without me
• ↳ for example when I'm sick, have to work or study for school → makes studying even worse
• SOCIAL MEDIA → seeing people "enjoying life" while you "can't"
• when I'm stressed, anxious or overwhelmed with situation
• when my partner or friends are focusing
• anger when I already feel sad and isolate from others
• travelling for long time alone (pandemic)
• being alone at home in general
• when I don't know people in a group → feeling left out, the outcast
• very busy places can feel lonely too
• when people don't understand your needs! → when it feels like no one can offer help, → having to solve challenging problems on my own
• ZOOM → no real talks, alone when laptop
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(Fig. 9)

# INDIVIDUALISM VS. COLLECTIVISM

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Even though loneliness can feel so different and occur in different situations depending on the person, I still wanted a certain frame in which I could investigate further. This led me to Hofstede's 6 dimensions theory, which is a framework that shows the effect of society's culture on the people living it. One aspect is the individualism vs. collectivism of a society.
Switzerland is mostly defined as an individualistic society, which for example means that people rather like to live alone, work on their own and just live independently. The fundamental issue addressed by this dimension is the degree of interdependence a society maintains among its members. It has to do with whether people's self-image is defined in terms of «I» or «We».
In Individualist societies people are supposed to look after themselves and their direct family only.
In Collectivist societies people belong to «groups» that take care of them in exchange for loyalty.
Both German and French speaking Switzerland score relatively high on this dimension, giving Switzerland a score of 68, and it is therefore considered an Individualistic society.
This means there is a high preference for a loosely-knit social framework in which individuals are expected to take care of themselves and their immediate families only.
In individualistic societies offense causes guilt and a loss of self-esteem, the employer/employee relationship is a contract based on mutual advantage, hiring and promotion decisions are supposed to be based on merit only, management is the management of individuals.

I think theory correlates a lot with the topic of loneliness. Both, individualistic and collectivistic society can have an influence on how one individual's mood can be influenced. Both dimensions provide different cultural and societal structures and norms.
Individualistic people generally have low ideal social embeddedness goals, while collectivistic people strive for a higher ideal social embeddedness. It is then crucial how the actual social embeddedness is fulfilled according to the ideal desires. These desires depend on the societal structures of the society. If the societal desires are not matched, the consequences for the individual could eventually end up in loneliness. An unfulfilled norm of social embeddedness could for example be the lack of close relationships.

With this discovery, I was able to narrow down my target group a little more precisely, as I now wanted to focus on individualism in Switzerland. This means that in the future, when developing my project, I will focus on scenarios that could be common areas of an individualist in Switzerland.
My thoughts mainly revolve around situations such as people living alone in a home office, or generally places where people work independently. Another finding is that in a society, loneliness usually occurs when personal or societal standards regarding the social embeddedness are not fulfilled.

(Heu et al., 2018)

# URBAN LONELINESS

Loneliness can occur at any place, no matter if one is living in a rural or urban environment. Nonetheless different living environments can also influence the source and consequences of loneliness, as well as the perception of the experience of it. Since I decided to focus more on individualistic societal structures, I also want to investigate the space where it's more common, which is in urban areas. (Molzner, 2021)

Every third person in Switzerland feels lonely nowadays. Every 15 to 24 year old living in Switzerland feels lonely every now and then or even at all times. This rate is even significantly higher among immigrants, as well as among women. (Miller, 2020)

8.1

It is interesting to see that in urban areas, where a lot of people more likely live in dense spaces and close to one another, feeling lonely is more common than in rural places. This shows that living in close proximity to others, doesn't essentially enhance the feeling of togetherness and connectedness. There are different aspects that eventually make sense of it.
As already found out, individualism may be a core factor to this. Another aspect is the transience of population in urban areas.
Many, essentially young people like to move around from city to city, which leads to a lot of «non-native» visitors, which makes it harder to form meaningful and solid groups of connection.

A burden to build up social connection may as well be the «negative politeness» which is quite common in Switzerland. Negative politeness refers to not wanting to interrupt or disturb anyone in social, public structures. Most people try to avoid any interaction with another person in public, if not necessary. Even if we are currently in a public, social space, most people behave as if they were alone, and also rather want to be left alone. This might not apply to everyone and depends on the political place one is operating, but it is more common in urban areas to be for oneself, when we look at e.g. public transport, public waiting areas, etc. However, in rural areas, I have noticed that people are more likely to be open for communication in public spaces. (Locher, 2008)

# SOUND THERAPY

9

During my research I came across Sound Therapy which I found quite interesting to consider as an aspect for my project, due to its physical and psychological healing functions.
Sound therapists believe that our bodies contain «energy frequencies» and that sonic frequencies can be used to reattune these energies when they go off key. All you have to do is lie down and bask in the tuneful beauty of «pure» sound.
Sound therapy is said to help not only physical illness, but also help balance the emotions and quieten a busy mind. Most people feel calm and relaxed following treatment. For some, this feeling will last several days. You may also be given exercises to practise between treatments. There are different techniques on how sound therapy is used. (Santos-Longhurst, 2020)

## SOUND BATHING

9.1 A popular kind of sound therapy is the sound bath. This therapy can be conducted with various healing instruments such as gongs, drums, singing bowls, tuning forks, and more.
This kind of therapy is usually executed by professionals in e.g. yoga and meditation studios. During the therapy, the treated person is basically being bathed in sound waves. The patient is usually laying on the ground, while letting the different sounds and frequencies, created by the therapist, be absorbed by the body.
There is no melody intended in the rhythm of the instruments played, since it is not wanted for the brain to recognize a pattern of a beat to fully let the treated person relax.
Different sound bathing instruments affect different organs, emotions, illnesses, diseases, chakras, and even trauma.
Normally the physical and emotional condition is checked before a therapy session to then conduct the needed treatment. It is also said that one can reach a deeper state of consciousness, to unplug from the external world and allow the body to recharge and let go of uncomfortable feelings. (Gould, 2020)

I wanted to experience a sound bathing therapy session, but unfortunately the prices for a professional session were too expensive for the frame of this thesis.
However, I found a video conducting a therapy session, inviting people at home to participate. (Healing Vibrations, 2019)

As expected, the effects of the sound bath weren't as striking as they would be if it was experienced in person, since I only had input through my headphones and not the full body. Yet, the sounds were quite mesmerizing and eventually still put me in a relaxed state of my consciousness.

# BINAURAL SOUND THERAPY

**9.2** Binaural beats occur when you perceive similar frequencies from the left and right that are slightly different from each other.
These different frequencies are heard simultaneously, with a superposition of sound waves in the brain. We perceive sounds with our ears, but the actual auditory perception happens in the brain. If you hear a sound at 220 hertz with your left ear and a frequency of 224 hertz with your right ear at the same time, you should be able to perceive the difference of 4 hertz in the form of binaural beats. So your brain creates sound waves with a frequency of 4 hertz.

The idea behind the targeted use of binaural beats is that the brain should be able to be influenced by them. Certain binaural beats frequencies are supposed to be able to specifically put the respective person into a state of rest or activity by creating the corresponding frequency difference in the brain.

Some people may need help decreasing their anxiety, while others might want to increase their concentration or deepen their level of meditation. (Gonzalez, 2019)

## SELF-EXPERIMENT BINAURAL BEATS

**9.2.1** I tried binaural sound therapy with the help of the app «Atmosphere». The app guides the user through the therapy and clearly explains each aspect of the therapy, like the different frequency patterns and their purpose.
My focus was still on reducing the feeling of loneliness, so therefore I tried using frequencies that help relaxing and reducing anxiety, since this is a symptom of loneliness.

I did it a few times right after I woke up and when I felt stressed during the day. Usually I did it for just like five minutes, because I couldn't hold the attention span any longer.

Normally when I am stressed, I feel a tension in my neck and jaw. After trying it a few times, I actually felt a relief of the tension and my mind felt less stressed and more relaxed. I was honestly surprised that it worked this well in such a short matter of time.

I would've more likely assumed that it might work only in a longer period of time like over a timespan several weeks with regular repetitions.

## LEARNINGS

**9.2.2** The biggest learning I had though was that loneliness and sound therapy are highly correlated. A lot of physical and psychological symptoms of loneliness can be reduced by practicing sound therapy. The therapy can decrease anxiety and depression, relieve stress, reduce blood pressure and pain in general, which are all side effects that come from loneliness.
However, this method is more useful to reduce loneliness in terms of the alleviation of the consequences that come from it, rather than creating a feeling of connectedness from a social perspective. Nevertheless it can help to create a solitary moment for oneself by taking time to relax from the possibly busy day to day life.

During further investigation and evaluation of sound therapies, I have realized that I would need to dive way deeper into the scientific aspects of the topic, if I would want to correctly conduct this method for my project. I rather want to keep my project development on experiences that are gathered during various experiments, rather than plain scientific research.

Despite that, sound therapy is already a developed method on how to use sound as a tool to influence the human body, when I want to find an approach that I can shape and manipulate in my favor.

Listening to the frequencies themselves is very unusual. I found it extremely exciting to have this experience and even though I don't want to put too much weight on this field, I can still imagine using certain aspects of it, like for example the different frequencies as an additional healing factor.

# HUMMING THERAPY

**9.3** The human voice is also a great tool to use for sound therapy and it requires only one of the simplest sounds a human can make, which is humming. Even if it is simple, it's still very useful, since it is known to reduce stress, lower heart rate and blood pressure, and to help the physical condition in general. There are different humming and breathing exercises to conduct that initiate those benefits of it.

So how does it work? The moment you begin to hum, you are giving yourself a sonic massage, inside and out.
One can feel the vibrations going through the body. These vibrations stimulate components of the vagus nerve, which is the biggest cranial nerve of the human body. The vagus nerve functions as communication between the body and the mind. So when the nerve is stimulated it basically tells the brain that the body can relax, which further brings the mentioned benefits with it.

(Goldman, Goldman, 2017)

I didn't investigate too much further into this technique, but the aspect of using vibrations led me to correlating the topic, which I will talk about more in the following section.

# OBSERVATIONAL EXPERIMENT

**9.4** When we look around, everything in life is vibrating. Our natural environment has its own vibrations and when we attune ourselves with those vibrations whether spending time in nature or listening to the sounds of it, our vibrations harmonize with them and we shift states to be in alignment with that of nature. natural sounds like leaves in wind, ocean waves are calming and relaxing while artificial sounds can more likely promote stress and anxiety.

(EarthSky Voices, 2018)

I really wanted to experience those vibrations and feel their influence on myself. I went outside in the forest and actively listened to all the natural sounds and tried to really soak them up.

I guess it's not a secret that going out in nature has a positive effect on us, since most of us have probably experienced it while going for a walk in the forest or a hike on a mountain.
On the other hand I also tried to actively listen to the sound of urban areas, especially in Zurich.

Obviously, it was very noisy due to the traffic, a lot of people, machines working at all times. I kind of even got anxious. The loud sounds in combination with the stressed visuals are really unpleasant, when you try to listen to everything at the same time. I also realized that I usually put in noise canceling headphones, even when I don't listen to music, just to tone our stressed society a little bit down.

# LOW FIDELITY PROTOTYPE

10

I tried to combine my findings and observations that I've made in this chapter and result with a prototype from it. I made a few sketches and then created a very low fidelity prototype out of it. The idea of the prototype was to create a gadget that forces the user to take a solitary moment while feeling anxious or stressed, to not let it result in loneliness.

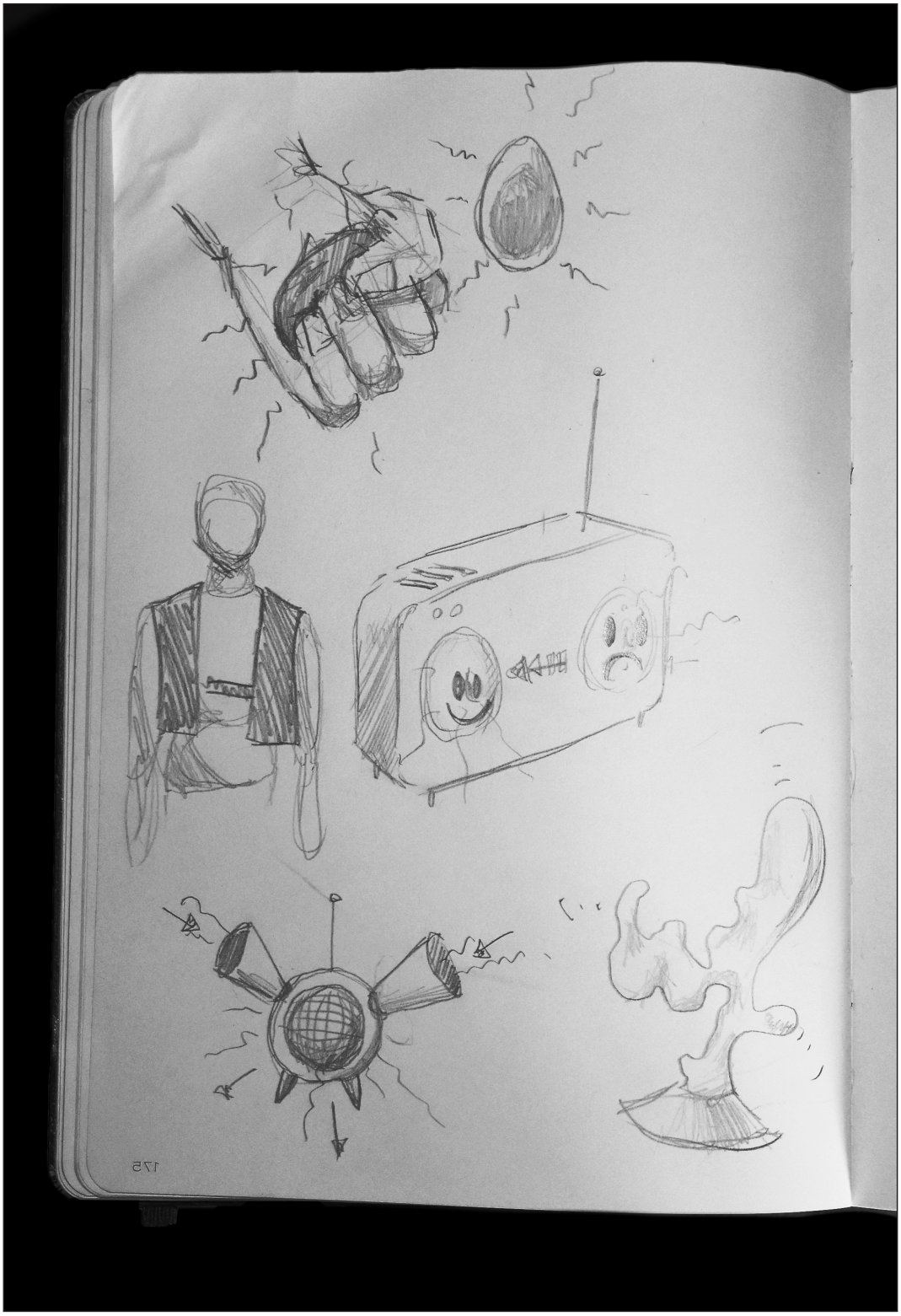
The prototype shuts off the eye vision, so the user doesn't get distracted by their visual environment. It then plays sounds of a comforting place of that person, to let them drift away to a place of solitude. The user has to spend time with themselves for a few minutes and gets the opportunity to release the discomforting feeling and reflect on themselves.

Compared to the Honne project which was introduced a bit earlier in this chapter, I tried to use its idea of escaping a stressful situation, but I wanted to create a more immersive experience, to really take the user to that place.

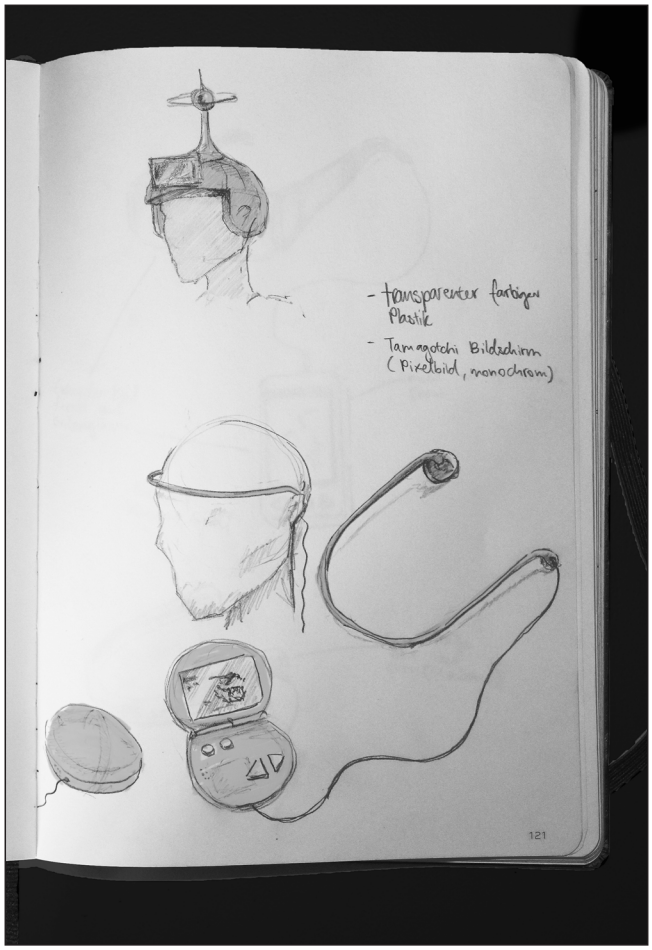
This prototype at this low fidelity state was more of a quick brainstorming idea that resulted from my latest research, rather than actually fulfilling the purpose of gathering new learnings by testing the prototype out. I handled everything manually, blocked out t he vision, and played the sounds by myself.

It still was a relaxing experience to just shut myself off for a moment while feeling stressed, even if I forced this moment for myself. Nonetheless I definitely liked the direction this prototype was going, to create a gadget or artifact that could be a helping hand during the day to day life.

(Fig. 10)



(Fig. 11)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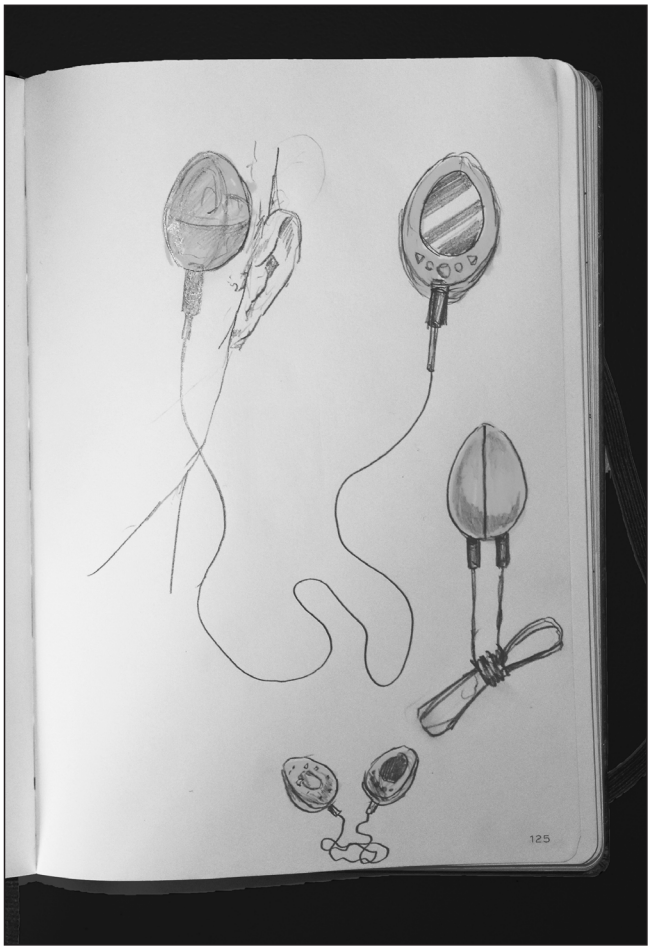
(Fig. 12)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(Fig. 13)

# EXPERIMENTS

11

During the further development of my project I tried various experiments to get a better handle on how the experience of loneliness can be perceived and on the other hand how I could use sound as beneficial as possible to enhance the feeling of connectedness and social presence.

To best experience loneliness myself I tried to do different experiments that require self isolation and can be done by one alone.
All of these experiments included different ways of auditive input which were beneficial to investigate how environmental sounds of our living together influences our perception of connection in that space. The following experiments were crucial to find a meaningful outcome of the project development.

## EXPERIMENT 1

11.1 The first two experiments were to find out what influence sound in our day to day life has on our perception of our connection to the outside world. I wanted to see how sound in day to day situations may trigger the feeling of loneliness and on the other side which sounds or environments make us feel more connected.

My first try was to completely shut off all surrounding sounds, even in a usually noisy and crowded place like the Zurich main station.
I did this experiment by simply putting in ear plugs that were as tight as possible so as less as possible sound inputs could come through.

As I already predicted I found this experiment kind of scary at first. It's weird to not hear what is happening around us, especially in a place where a lot of busy things happen, spince the auditory environment is an important aspect to be prepared for what is taking place around us. Therefore not having the auditive input of a noisy place also led to quite feeling disconnected to everything around me. It feels like when you're daydreaming and kind of shut everything else off until something puts you back in reality. Except for the fact that a was fully conscious and perceived everything happening visually.

It made me realize that next to our visual sight the auditory inputs are the most important sense to orient oneself in public, busy spaces. Many times I found myself being afraid of bumping into someone at any moment.

I also noticed that I looked behind me a few times due to not having an idea of what was happening behind my back, without hearing what was going on. But that experience may also vary from person to person, since I personally like to be very aware of my surroundings to especially not bump into anyone or the likewise.
Overall I found out that even noisy and annoying sounds promote connectedness more than complete silence.
An environment feels lonely quite easily when there is no environmental sound, because silence blocks out the connection to each other and the general political space. When we can't hear, one of the most important communication tools is killed and it's harder to not interrupt or feel excluded from our social environment.

This doesn't even only apply to humans and our verbal communication, but also our environment can communicate and give us different signals, which we are able to understand and use as a tool or trigger a certain state of our being.

# EXPERIMENT 1.1

**11.2** The second experiment was similar to the first one, but I tried to mismatch and change the auditive environment to the visual environment, instead of just completely shutting it off.

In this case I wanted to find out how the environment is perceived when the surrounding sounds are different from what it is expected to sound like. I did that by just listening to for example natural sounds from the forest while sitting on a bench in a very crowded place.
I think this might be something people already do to create a more relaxing atmosphere during stressful moments, but I still wanted to observe this technique more attentively to see what it's really about.

It was a refreshing experience being able to convert the usually noisy city sounds into a calming ambience. While everyone was stressing around, I was completely calm for some moments. For me it was interesting to see how I was able to dive into a different environment, while actually not being there. Of course it didn't feel too real, but when I closed my eyes I wouldn't have known I wasn't actually in that auditive space.

# EXPERIMENT 2

**11.3** The next two experiments were digitally based and I played around a bit with different sound tools. The goal of these experiments was to simulate a social space auditively with spatial sound in a lonely place, to see if it increases the feeling of social presence and connectedness.
To create my 3D-audio space I used the software «Ableton» which lets you distribute different sounds to come from different directions in your headphones. To distribute these sounds I used different plug-ins that come with Ableton, so I could place each sound in a different position around my head to create the maximum potential for this experiment.

I tried to recreate different social places such as an office, a park, and a library. For the office as an example, I had a general ambient office noise as a background, and different keyboard typing, paper flips, shoe steps, and paper printers distributed on different locations to simulate people working around me.

There has actually been a website created already exactly for this purpose. The website is an auditive project that lets the user dive into an office space, and even the ability to change the volume of these typical office sounds. Sound of Colleagues is the result of a creative collaboration between the advertising agency Familjen STHLM and audio branding agency Red Pipe Studios. It was created as a reaction to this spring's strict work from home policies in Sweden.

All these techniques for the experiment had a similar experience, when the ones I did in Ableton actually were more fun to adjust and pan the specific sounds in the room myself.

I really enjoyed this experience, creating an environment that actually isn't there. I knew that no one was actually here, but I still felt some connectedness hearing the voices and the people working. As a person that used to work in an office and is used to the sounds, I got a very familiar feeling.

# EXPERIMENT 2.1

**11.4** For this experiment I used the same techniques as I did for the one before, but only trying to simulate one single person being in the same room, making some sounds and noise every now and then.
This experiment was to see if the simulated presence of one person while actually being alone is more creepy rather than creating that social connectedness. To do this I used single sounds such as short coughs or paper sounds to simulate that person working in the same room as me.

This definitely didn't have the same experience as the experiment before. Since I panned the sounds of the person mostly behind me, I constantly felt watched every time I heard a sound coming from behind me. This experiment rather created tension and nervosity than creating a friend being in the same room.

# EXPERIMENT 3

11.5 From the last experiment I learned that the effect of simulating just one person alone in a room is more creepy than connecting. So for this experiment I wanted to actually put a real person into my auditive space. I simply did this by calling a friend that was working at home at that time as well, but instead of talking with each other like in a normal phone call, we just put our phones next to us to only have the environmental noise to feel each other's presence. I wanted to see if it turns out to be an awkward situation and feeling like one has to behave a certain way due to being auditively observed during the whole time. The goal was to create connectedness by using the environmental ambient sound of one another. We did this experiment for like a solid two hours until we decided to stop it.

For both of us it was a nice feeling knowing that someone is present during the whole time. Unfortunately the mobile phone microphone had a lot of noise, which sadly decreased the realism of the whole experience of having someone present in the room.

This didn't really matter though, since the feeling of knowing that someone is connected with ourselves even if they aren't actually in the room already reduced even the thought of getting to feel lonely.

# EXPERIMENT 3.1

11.6 This experiment is just a little addition to the one I did before, except that we didn't put our phones right next to us, but place it somewhere in the room, while even changing its position during time. This was to see if it feels more realistic and like someone is actually somewhere in this room, since having the phone on the desk like before also deleted that realism due to the sound being more two dimensional rather than spatial.

# PROTOTYPE EXPERIMENT

**11.7** This experiment which could also be considered as a very low fidelity prototype of my concept idea for the final product was inherited to see how I could create an immersive spatial sound experience without using headphones, and then to find out how that auditive environment influences the testers of the experiment.

To conduct this experiment I first recorded my own environmental sounds with a Zoom and another microphone that I borrowed from the school, to get as clean and sharp sounds that I could later distribute in a space. To then distribute those sounds I used four speakers all together to be able to play sounds from as many directions as possible. I had two bigger speakers which I generally used to play the more ambient, background sounds, and two smaller bluetooth speakers, that I used to play more accent sounds like birds twittering, or a bike driving by in the distance.

I rented a whole room in the school to myself to do this experiment. I wanted to have enough space to make a different composition of the speaker set up and also the position of the testing person. But in general the tester sat in the middle of the room, while the speakers were surrounding them. The participants were also allowed to walk around freely.
Unfortunately for the framework of this experiment, I wasn't really able to create that common working or learning environment for the testing students, due to the room being quite plain and being constantly observed while having nothing to actually work with and focus on. I also had to be present at most times, due to having to install the compositions of the  speakers and the playback of the different sound environments. Yet I left the room a few times to try to resemble a more isolated and lonely space for the tester.

Since I rented the room for the whole day, I was able to do the experiment on myself to a greater extent. I was working on my laptop for a longer period of time, which gave me a bigger feeling of an isolated and lonely situation and therefore made a bigger impact with the experiment.

Creating the spatial audio was a full success. The participants and I myself were impressed by how easily an immersive experience can be done. When I e.g. played the sounds of a park, it really felt like the wind blowing through trees standing in the seminar room, while hearing birds chirping from different sides.

(Fig. 14 & 15)

(Fig. 16)

# FINAL PROTOTYPE

12

## INTRODUCTION

12.1 I decided to create an interactive artifact as a result of my findings and learnings I received during my research.
The artifact includes different aspects that I've got on how to overcome and endure lonely moments with the help of sound. I like to call it an interactive artifact, even though it might rather be seen as an interactive tool, since clearly it's based on research considering the field of Interaction Design. But I also want to look at it as a result of my research and findings that I incorporated into an experienceable interactive artifact for the purpose of the final exhibition of our thesis.
The tool that I came up with tries to help a lonely person to feel a certain presence of another person. Nevertheless, it is not restricted to a certain type of group and can be used by anyone, if feeling lonely at the moment or not.

## CONCEPT

12.2 The concept is to let a lonely person dive into someone else's environment auditively to create an atmosphere, which both or even more parties can embrace and appreciate together.

This method is meant to boost their sense of social connectedness, even when they are actually not at the same place.
On one end of the device is the «host» of the environment of which the «listeners» on the other end can tune in and create a spatial auditive atmosphere for themselves.

This may at first sound like general communicating tools that already exist, but I wanted to incorporate the different aspects of how sound can improve social environment, without having to straightforwardly communicate verbally with one another.

## HOW IT WORKS

12.3 One person is able to open the microphone on their radio device and record their environment which could be e.g. when they experience a solitary moment, but also social situations like a conversation could be a possible space that can be created in terms of simulating a feeling of social connection for the listener on the other side.

The listener is then able to tune into that environment by choosing a radio channel that is automatically created when someone decides to open their microphone.
To create a realistic spatial auditory experience of that environment, the listener can distribute the three modular speakers of the radio around themselves to have a 3D-audio atmosphere.
On the other hand, the host of the channel can distribute the modular pieces of the radio to record different specific sounds.

The radio has additional features such as an LED that blinks up when either a lonely person is invited by other users to join their moment as well as it blinks up for the «host» of the channel when someone tunes in. This lets the users get a better feeling of the presence of one another. The channel scale of the radio is an interactive interface that marks active channels in different colors and sizes depending on the environmental mood of the sound and the amount of people that are currently listening to that channel. I tried to keep the design and each functionalities of it as simple and intuitive as possible, due to wanting to have the initial concept and experience as clear as possible and not have too many distractions from its intended purpose.

# RADIO ANALOGY

**12.4** **The look and feel of the prototype is heavily inspired by one of the existing communicating tools, which is the classic radio. The invention of the radio goes back to the late 1800s. The Radio has been one of the most important communication tools since a long time ago and supports different notions that I find fitting for my approach. Even today in a world of digitality, the radio still reaches the greatest number of people around the world.**

(UNESCO, 2019)

(Fig. 17)

# TUNING INTO AN ENVIRONMENT

12.5 The «listener» is the person that might be in an isolated, lonely situation and wants to overcome it. With my radio device the person is able to tune into the different channels to see what environment fulfills their needs best to get a greater feeling of social connection.

The radio includes three modular speakers, of which the two on the left and right are detachable from the main component of the device. These speakers are meant to be distributed in the current space of the listener to have different audio inputs from different sides, which eventually simulate a more realistic, spatial, auditive space. This helps the listener to really dive into the environment of the other person and create a greater feeling of presence. The distribution of different speakers to create that spatial audio may seem like a more outdated or overcomplicated approach, when I could've just went for a single professional speaker or headphones that are able to support spatial audio. The reason I made this decision is based on the different auditive experiments that I've conducted. The contra of headphones is that they have the side effect of shutting everything surrounding them off and therefore disconnect even more from the actual environment. Professional spatial audio speakers could've actually been a possible solution, but I thought the playfulness of the device, deciding where to place speakers and exploring the different sound coming from each, would've been lost.

# HOSTING AN ENVIRONMENT

12.6 The «host» is the person that shares the auditive environment for others to tune into. The auditive space is created with the integrated microphones which record the environmental sounds of the person.

The recording person is completely free on what kind of environment they want to share. It can be natural sounds like the wind in the leaves of a forest or the water splashing next to a river, a solitary moment they want to share with someone else to embrace the solitude alone, but together. But also more communicationally present sounds like conversations, monologues, or just dull voices of people talking in the background can be an atmosphere to improve the social presence. Since there are no restrictions, noisy sound environments like a construction site or traffic in a city can be created. It doesn't really matter how the host wants to «design» their channel, since at last, the listener on the other end decides who's environment they want to dive in. Not to mention the fact that each listener may have a different taste or a different need of an atmosphere they need to feel less socially isolated.

The host can use the ability of the distribution of the modular parts as well, since they all include a microphone as well. Therefore specific sounds in a space can be recorded to create an even more realistic transmission of the auditory input.

# THE INTERFACE

On the whole, the experience of the device is oriented rather towards the listener, which of course makes sense, since the listener is more the lonely person who is to be helped with the tool, to make a lonely situation a little easier.

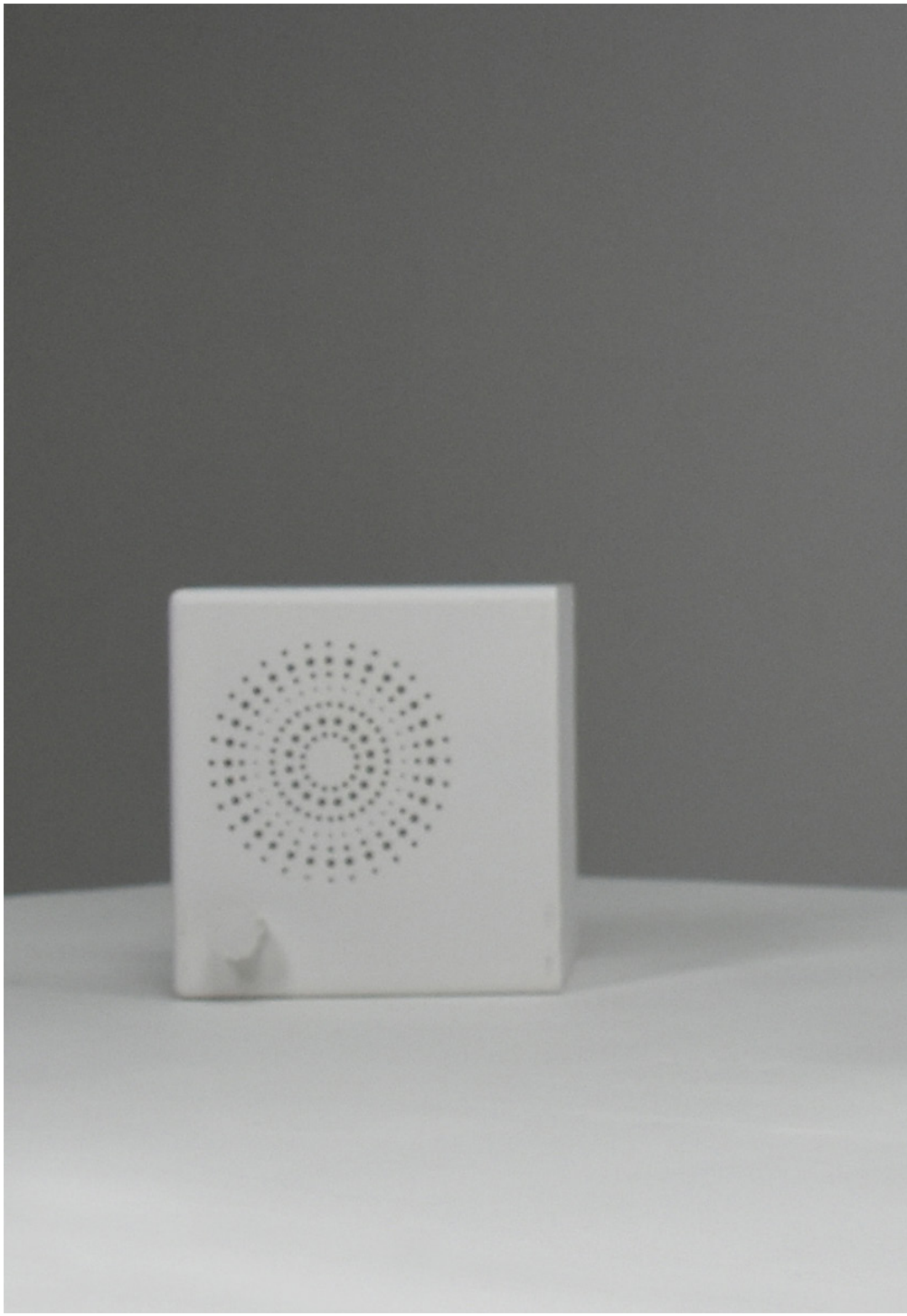
However, it is important to consider whether the connectedness is really provided if the host does not notice when someone joins their environment and feels comfortable in it.

This is why I came up with the idea of a small LED attached to the radio that flashes up on the host's device when someone enters their channel. The host then knows that he or she is present with someone else and thus increases the togetherness of both parties.

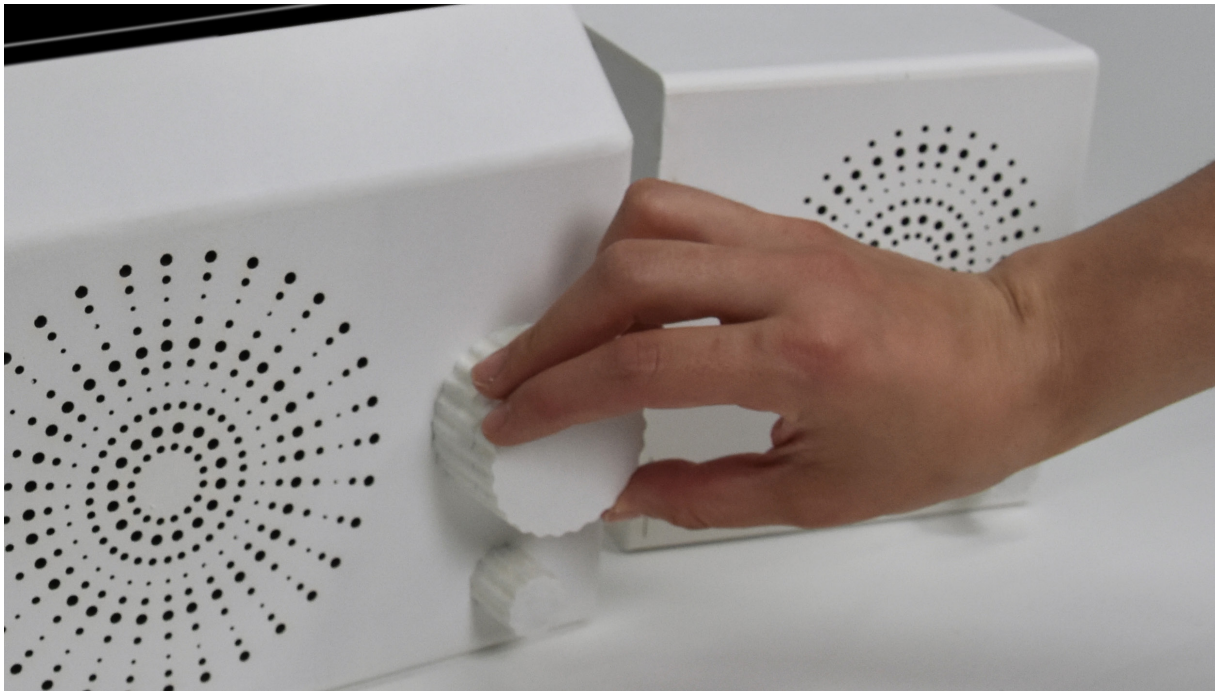
**12.7** The interface can be used by the listener to scroll through the different channels. It is inspired by the classic radio channel scale, displaying each channel as a vertical small line on a longer, horizontal line. When a channel is active, it is marked with a colored dot, to let the listener know where they can tune into.
The colors of the dots depend on the mood that the environment of the channel incorporates. Green is for calm, ambient environments, Blue for a bit more noisier atmospheres such as conversations between two people, and Red symbolizes really noisy environments such as a workshop or a construction site.
To scroll through the various channels, a classic rotatable knob button is used as we know it from classic vintage radios.

With this, an analogy to the feeling of loneliness is conducted. When scrolling through different channels on a classic radio, one doesn't really know what they're looking for and one just keeps looking for something that fulfills their current mood or needs. When it comes to loneliness, one also doesn't essentially know what they need to reduce or atleast endure the feeling of being lonely. Therefore the listeners of my prototype can scroll through the different environments until they find something that fulfills their current need, and when it doesn't match, they can just continue scrolling for the next matching channel.

(Fig. 18)



(Fig. 19)



(Fig. 20 & 21)

(Fig. 22 & 23)

# RESULTS

**12.8** At this point of the thesis the prototype in its final form unfortunately wasn't fully developed to test all aspects combined at the same time. Nevertheless, most of the experiments I did during this chapter helped me to get more answers to my research questions and therefore implement these findings in the concept of the final design of my product.

Since the last presentation of the prototype, I already got a lot of input on how the features of the radio can be explored and used in different ways. When the prototype is ready to be tested, I will be able to evaluate these ideas and iterate on the usability of it.

# ACCESSIBILITY

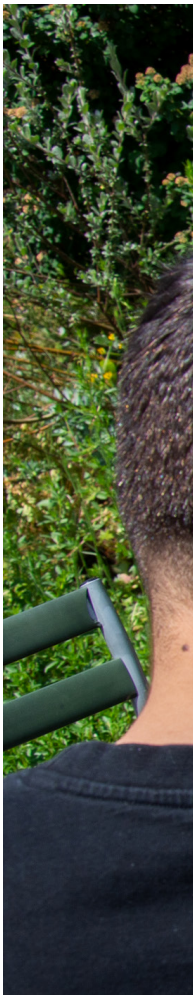
**12.8** In the process of prototyping, I set up different scenarios to see how my tool could be used in real life and actual situations. Quite quickly, the question emerged on how many people would really make the effort of hosting a channel specifically for another person.

Also, one might not always have the radio with them when they are in a place they would like to share. That's why I had the idea to additionally package the functions of the radio into a website, so that the tool can also be used at any time, even when one does not have the radio with them.

The website should support the features to host a channel and also to dive into other channels as a listener. The website should also have an explanation of the radio and its functions, as well as small instructions showing how to create an immersive experience at home, for example with Bluetooth speakers or the speakers of the laptop and mobile phone. So people without access to one of the radios, can still experiment with creating a spatial auditive environment by themselves with tools available.

The problem with using the radio via the smartphone, however, is that a smartphone cannot support the same technical aspects, as they only have a microphone and a speaker and thus no spatial audio can be created. Alternatives would be, for example, to use the radio via the smartphone with headphones.

For the scope of the thesis, however, the website will be reduced to the explanation and instruction of the tool. Since it is difficult to explain all aspects of the radio verbally in a short and comprehensible way, I think it makes sense to pack the whole thing compactly into a clear website and use it as an additional means of communication.



# COMMUNICATION

13

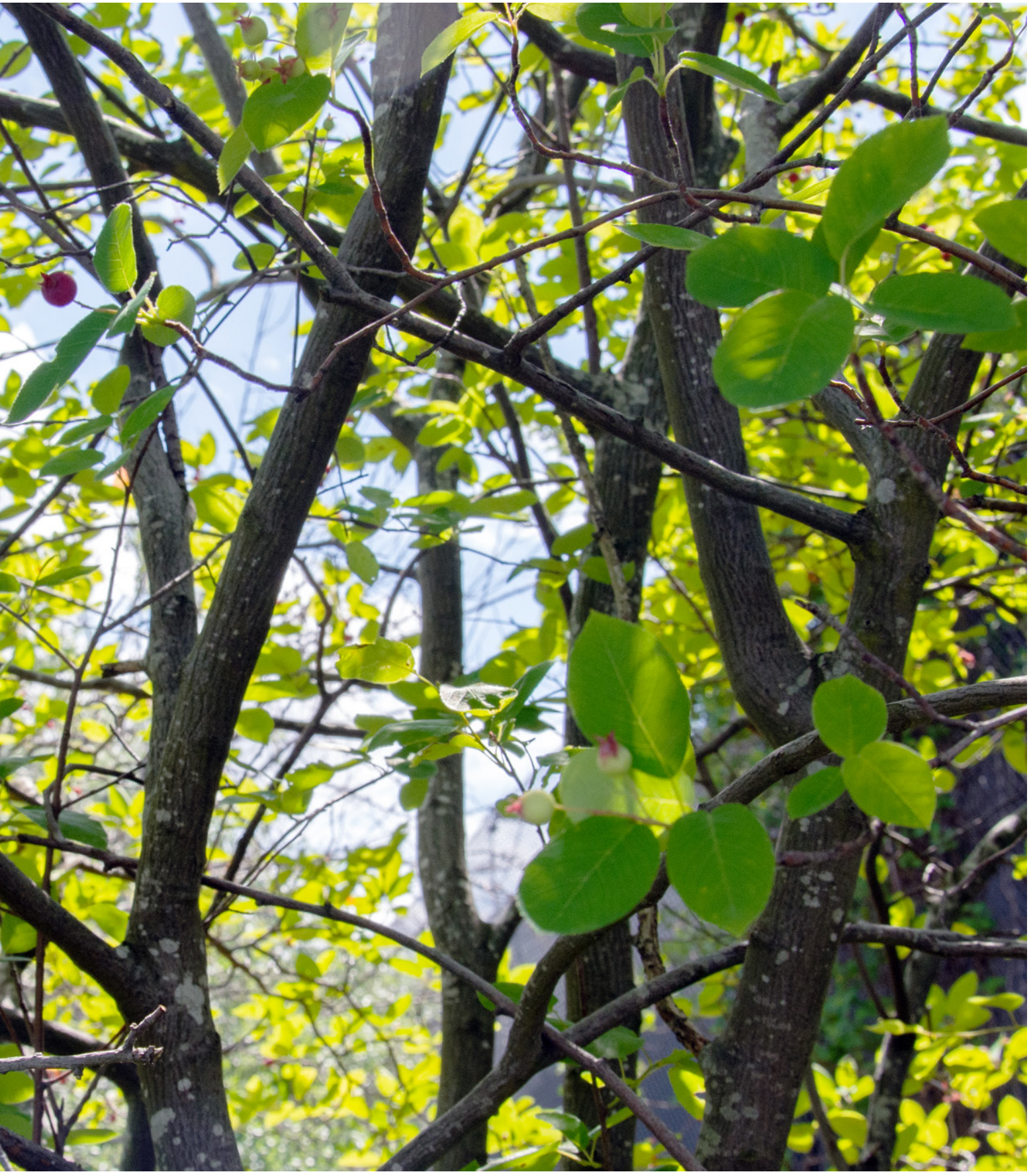
## VIDEO

13.1 In my video I would like to show in which situations my prototype can be used. For this purpose, the various aspects of the radio are to be shown. I want to show the experiences that the users have in order to support the concept.
The Storytelling is about a person who is in a lonely situation and is scrolling through the different channels of the radio. The video shows how the person uses the radio and how the connection to another person builds up while the loneliness slowly disappears.

## EXHIBITION CONCEPT

13.2 For our final exhibition I want to recreate an isolated situation. Since my main target group are individualistic people, living in urban, busy areas I want to resemble a home office situation.
For that, I want to use props like a desk lamp, an office chair, and an iMac with mouse and keyboard. These props shall all be painted in the same colors, to have an even, coherent look for the exhibition. The printed thesis and the prototype should then be in a different color so that they catch the visitor's eye.
The prototype is placed on a small stand, which will be highlighted by the table lamp like a spotlight, in order to stand out even more.

(Fig. 24)



(Fig. 25)

(Fig. 26)

(Fig. 27)

(Fig. 28)

# CONCLUSION

14

Loneliness is a topic people usually rather not talk about, since it is something that is undesired in our society. Everyone has felt lonely in a certain situation, but not many really deal with the topic, or even know that they feel uncomfortable because of the feeling of loneliness. Therefore, throughout the process of the last months, it was important for me to be as close as possible to my target group and the possible users of my final result. Since my target group is specifically oriented towards the individualistic society of Switzerland, in which I also find myself, I was able to include the opinions of a large part of my environment.

What I learned during my research and resulted in my prototype is mainly based on the experiences and feedback I got from the participants of my experiments or through general conversations and interviews.
Overall, I think there was a clear red thread running through the whole process. It started with a lot of desk research, which then led me to the ideas of the different experiments, which eventually led to my final product.
First I tried to find out where loneliness is in our society and how it feels. Then I tried to find solutions against loneliness, of course with a focus on sound and auditory tools. I was then able to use these solutions, or rather approaches, to develop and carry out my experiments, which ultimately led me to my own approach in the form of the radio device.

At first I was worried that the topic of loneliness might get too close to me, as it is not necessarily a pleasant problem for the psyche. It was also clear to me from the beginning that I would probably put myself into social isolation for the sake of various experiments in order to be able to consciously observe how loneliness feels and what effects this feeling has on my mental and physical condition.
It was also exciting that I myself unintentionally felt lonely while working on my project, without realizing it at first. There were sometimes days when I really isolated myself physically and socially from my surroundings because, for example, I was absorbed in research and almost forgot about the outside world. I then also realized that I myself am actually a perfect candidate as a user and tester of my project, because I consciously or usually even unconsciously put myself in isolated, lonely situations. That's why many of the findings are also based on experiments I conducted on myself.

At a later stage, I also used some of the experiments repeatedly when I noticed that I was in a lonely situation. This allowed me to test the experiments over a longer period of time and continue to evaluate them for the development of my final product.

This was especially helpful in moments when I was rather unproductive and not so motivated, because I was still able to gather more insights along the way.

I think my biggest problem from the beginning was that I was always unsure what the final product of my thesis would be. Despite generous and repeated brainstorming, I did not manage to come up with a meaningful idea in the beginning. Unfortunately, this meant that I was not able to develop as much material as I would have liked in the chapter that was supposed to focus on developing different prototypes.

This phase of prototyping would also have been very important for me, since I eventually decided on a gadget as the tool for the final prototype. That's why everything got postponed a bit for me and I was forced at some point to develop an idea for the prototype as quickly as possible.
In the end, however, I am very happy with the prototype that I have developed, as I think it includes many aspects that I found out in the process and supports my concept.

# KEY LEARNINGS

14.1

## → the influence of sound on the environment

With the various experiments I conducted where I tried to influence my surroundings by manipulating the environmental sound atmosphere, I realized how important sound is to orient ourselves in the environment we are in. From my experience from the experiments I think that sound is way more important than the visual aspects to find our way in a certain space.

## → sound can create social connectedness while physically alone
## → *and helps to embrace solitude*

This learning goes hand in hand with the first one. Since we are able to influence our environment with the help of sound, it is also possible to create a certain social presence auditively, while actually being physically alone in the current environment. There is no verbal communication needed to feel less lonely in a space, which in my opinion therefore also helps to embrace that solitary moment being alone.

## → an immersive, spatial, auditive space doesn’t require many tools

Furthermore, with the experiments using different speakers, I found out that there are no highly professional and expensive tools required to create an immersive, auditive space by oneself. It only takes two or more cheap speakers and a few different recorded sounds of a specific environment to recreate that space.

# CONTRIBUTION

14.2 One of the main reasons why I have chosen this topic is the relevance of it, as we are still in the corona pandemic. Since most of us have had to isolate ourselves physically and socially from other people, it is also a topic that many can relate to from personal experience.

This gave me the opportunity to try to find a solution to counteract a problem which, as I said, can affect very many people.
Since the problem is very common, there were also already a lot of possible solutions on how to reduce loneliness, which people came up with in the past years.

I already knew at the beginning of my intended contribution that I would not save the world with my project, but I found it exciting to learn more about the psychological aspects and their effects through in-depth background research and on conducting user tests and experiments based on this, which should then help me to achieve a meaningful end result.

One challenge I set myself was to focus on an auditory approach. I didn‘t know anything about the technical aspects of sound, so I didn‘t know what direction I was steering to.

Considering what a big role sound can have in relation to loneliness, I think it was the right decision to venture into unknown territory. I think it’s an unique approach to the topic and I was able to use sound in a way that wasn’t very common so far.
I came up with a tool that ignores the usual features of auditive communication of verbally talking, which concludes one of the most important findings, to finally develop a useful prototype that happened during experiments with sound. I was sometimes even surprised in how many different ways sound can be used to influence how the environment is perceived.

With my exploration of the auditive field I found different methodological approaches on how we can use sound for our own benefit. I found out what is needed to create a certain sense of connectedness, even when actually physically alone.

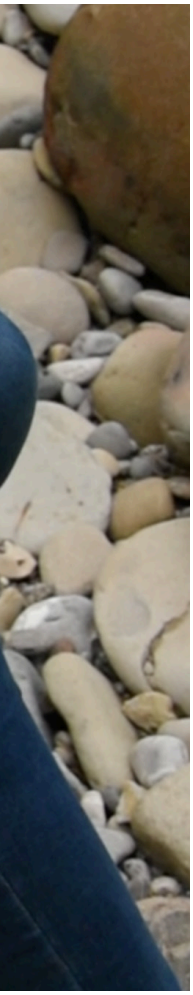
# FUTURE STEPS

**14.3** Since the idea of the prototype as a result of my research occurred to me only at a very late stage, at the end of the last chapter, I cannot record the results and iterations of user tests in the development of my prototype in my written thesis. Therefore, it is important for me to use the remaining time until the exhibition to further develop and elaborate the prototype as much as possible, so that I can at least report verbally on the iterations and tests. To do this, I am excited to hopefully create an exciting experience in the exhibition that can be used interactively by visitors.
I probably won't be able to fully elaborate the radio and make it work by the time of the exhibition, but I will make an effort to include different aspects so that the concept can be understood.

As I mentioned earlier, I have already received some feedback on how the radio could be interpreted and in various ways and how it could be used in different settings. It has been noticed that many people are quite interested in my prototype, as I have frequently been approached for talks and discussions about the possible further developments.
I am looking forward to proving and evaluating these aspects when I have realized the first version of the radio.

I also think that the theme of loneliness and isolation can be explored further, especially in conjunction with the auditory approach. Even at this stage, I have more experiments in my head that could be carried out to achieve even more aspects of connectedness through audio and thus expand and develop the radio even further.
Depending on how the project progresses in the future, I can even imagine that my prototype could become a real product used in our society.

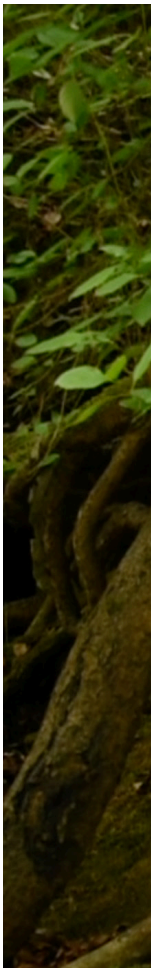
(Fig. 29)



(Fig. 30)

(Fig. 31)

(Fig. 32)



(Fig. 33)

(Fig. 34)

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# FIGURES