Master Thesis

Czech Technical University in Prague

F3
Faculty of Electrical Engineering
Department of Computer Graphics and Interaction

Non-violent communication assistant

Helping parents apply non-violent communication with their children

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Supervisor: Ing. Ivo Malý, Ph.D.
Field of study: Open Informatics
Subfield: Human-Computer Interaction
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ZADÁNÍ DIPLOMOVÉ PRÁCE

I. OSOBNÍ A STUDIJNÍ ÚDAJE

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Zadávající katedra/ústav: **Katedra počítačové grafiky a interakce**

Studijní program: **Otevřená informatika**

Studijní obor: **Interakce člověka s počítačem**

II. ÚDAJE K DIPLOMOVÉ PRÁCI

Název diplomové práce:

Asistent v nenásilné komunikaci

Název diplomové práce anglicky:

Non-violent communication assistant

Pokyny pro vypracování:

Na základě řádného výzkumu navrhněte pomůcku, která by rodičům pomohla aplikovat nenásilnou komunikaci v praxi. V rámci výzkumné části uspořádejte semistrukturované rozhovory s rodiči, vybranými tak, aby se pokrylo široké spektrum povahových rysů cílové skupiny projektu (rodiče s alespoň jedním dítětem do 12 let). Výstupem z rozhovorů by měly být současné přístupy rodičů k výchově dětí, způsoby, jak řeší problematické situace a nástroje a metody, které jim pomáhají v nacházení vhodných řešení. Zároveň shrňte základní poznatky z oblastí nenásilné komunikace a rodičovství, včetně popisu metodiky nenásilné komunikace. V souladu s metodikou UCD a s využitím nízko- a vysokoúrovňových prototypů vytvořte mobilní aplikaci pro využití nenásilné komunikace ve výchově. Aplikaci průběžně ověřujte uživatelskými testy.

Seznam doporučené literatury:

[1] KOPŘIVA, Pavel. Respektovat a být respektován. 3. vyd. Kroměříž: Spirála, 2008. ISBN 978-80-904030-0-0.
[2] ROSENBERG, Marshall B. Nenásilná komunikace: řeč života. Praha: Portál, 2008. ISBN 978-80-7367-447-2.
[3] GOODWIN, Kim. Designing for the digital age: how to create human-centered products and services. Indianapolis, IN: Wiley Pub., c2009. ISBN 0470229101.

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Datum zadání diplomové práce: **12.02.2019**   Termín odevzdání diplomové práce: **24.05.2019**

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III. PŘEVZETÍ ZADÁNÍ

_____   _____
Datum převzetí zadání   Podpis studenta

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Declaration

I hereby declare that this thesis is my own work and that, to the best of my knowledge, all of my sources are listed.

Prague, May 24, 2019

Abstract

This diploma thesis describes the design of a mobile application, the goal of which is to help parents solve conflicts with their children by applying Nonviolent Communication, and its subsequent implementation and testing with users. In the first part of this work, I summarize research conducted as part of this thesis — both literature findings and the description of the user research conducted and its results. I continue by describing my user-centered design approach used in making the app, including the creation of low-fidelity and high-fidelity mock-ups, the implementation of prototypes based on those, and the prototypes' subsequent testing with users. Finally, I describe the app's implementation and its testing.

Keywords: UX design, parenting, NVC, Nonviolent Communication

Supervisor: Ing. Ivo Malý, Ph.D.

Abstrakt

Tato diplomová práce se zabývá návrhem mobilní aplikace, která si klade za cíl pomoci rodičům řešit konflikty se svými dětmi použitím tzv. Nenásilné komunikace, a její následnou implementací a testováním s uživateli. V první části práce shrnuji výzkum, který jsem v rámci práce provedl — jak poznatky z literatury, tak i popis a výsledky výzkumu s uživateli. Pokračuji popisem User-centered Design postupu, kterým byla aplikace navržena, včetně tvorby low-fidelity a high-fidelity mockupů, implementaci testovatelných prototypů na jejich základě a jeho následovného testování s uživateli. Nakonec popisuji implementaci aplikace a její testování.

Klíčová slova: UX design, rodičovství, NVC, Nenásilná komunikace

Překlad názvu: Asistent v nenásilné komunikaci — Pomůcka pro rodiče v použití nenásilné komunikace u svých dětí

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Chapter 1

Project definition

1.1 Motivation

Ever since I attended workshops on assertiveness and communication at my university's student center, I've been interested in topics related to emotional intelligence. Shortly before my second year of my Master studies began, a friend recommended a video about Nonviolent Communication to me. Though it was three hours in length, I watched with the utmost interest, albeit at twice the speed. I was convinced of the method's effectiveness ever since.

With my thesis, I wanted to focus on an area where I could make the most difference in people's lives. I find emotional intelligence (EI) skills greatly undervalued in today's society, with hard skills being the foundation of the state-mandated educational framework. I wanted to make something that would help people grow in this area. In particular, I wanted to focus on children, as habits related to EI are formed during childhood and get harder to change as time goes on. I was deciding between teachers and parents, as those tend to have the greatest influence on a person's childhood. In the end, I opted for parents, with whom I perceive the influence to be greater, even though each parent has influence on fewer children than a teacher does.

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■ 1.2 Goal of the thesis

In taking on this project, I set out to, first and foremost, help parents solve conflicts with their children in an empathetic, nonviolent way. Nonviolent Communication offered itself as an appropriate method to accomplish that. I set out to design, implement and test something that would help parents apply this method, using a user-centered design approach and ample research to inform the development.

■ 1.3 Introduction to User-centered Design

This project was designed with a User-centered Design (UCD) approach. This is an approach in which the users' needs, contexts, interactions, and mental processes form the basis of the design. Broadly speaking, it consists of gaining an understanding of potential users, translating that knowledge into models for use in design, brainstorming ideas based on those models, and then whittling down those ideas into a single concept. As it is being finalized and even after it is finalized, this concept is continually tested in terms of whether it serves those needs of the user that it aims to serve (including whether it is usable).

■ 1.3.1 Terminology

Let me describe some key UCD-related terms that are used in this thesis in my own words:

T1 **Wireframe**: A low-fidelity illustration of the concept consisting only of outlined shapes

T2 **Mockup**: An illustration of the concept

T3 **Prototype**: A rough implementation of the concept used for testing

T4 **Persona**: A fictional character whose characteristics represent the characteristics of a subgroup of the target audience

T5 **Scenario**: A story showing how the concept is intended to fit within the user's life

Chapter 2

Nonviolent Communication research

Nonviolent Communication (shortened as "NVC") is a problem-solving method developed by Marshall Rosenberg. A pupil of Carl Rogers (one of the key figures in humanistic psychology) [Ros03, xiii], Rosenberg designed the method to empower people to solve their conflicts themselves rather than be reliant on a trained mediator. It's a method used to resolve various types of conflicts, and it's just as suitable for parent-child conflicts as for other types [Ros05].

The method is founded on a simple premise: if two sides of a conflict gain an understanding of both their own needs and the needs of others involved, they'll be able to find a solution that satisfies both. The theory underpinning this is that there's a set of basic human needs that every person's need can be reduced to.

The method can be split into 3 modes [Lit08, 52–56]:

- **Self-empathy** — realizing one's own emotions and basic needs

- **Empathy** — understanding another's emotions and needs

- **Expressing needs** in a neutral way that does not stoke conflict

2.1 Self-empathy

As mentioned, Nonviolent Communication rests on the idea that there is a shared set of basic human needs. Realizing which needs a person has can be surprisingly tricky. To do so, NVC recommends first realizing one's own emotions, as emotions serve as indicators of met or unmet needs (pleasant emotions for met needs, unpleasant emotions for unmet needs).

As emotions have a physical component [Gol14], a person can scan their body to realize what emotions they are feeling and how they're affecting them. As with needs, NVC theorizes that emotions are universal. After realizing one's own emotions, one needs to connect them to the needs they're indicating. This can be done by examining the thoughts and situations in which these emotions arise.

NVC doesn't put forth a theory of basic human needs itself. Rather, it presents an unexhaustive list of possible basic needs and suggests people use them as inspiration [Ros03, 54–55]. Finding a concrete set of basic human needs is a problem area undergoing active research, and while there are popular models for basic needs, there isn't scientific consensus on this topic yet.

The needs one comes up with need to be general enough to allow a wide range of possible solutions. For example, the need for a clean desk would not be general enough, but the need for order would be.

2.2 Empathy

While it's important to understand one's own needs, it's just as important to realize the needs of others involved in order to find a solution that works for everyone. The key to this lies in empathically connecting with others, actively listening as well as paying attention to another's nonverbal communication.

As with self-empathy, one can use emotions as indicators of basic human needs. As it's harder to understand the inner world of others, it's useful to confirm hypotheses about feelings, thoughts, situations, and basic needs with the other person. Along with understanding needs, connecting on an

emotional level makes it more likely that the other person will work to resolve the problem.

If the other person involved is not well-versed in Nonviolent Communication, chances are that the language they'll be using won't be reflective of the principles behind Nonviolent Communication. For this reason, NVC recommends trying to discern the basic emotions and needs from the sentences the other person is saying, no matter how aggressive, judgmental, or indirect they may be. This encourages the receiver to understand where the person is coming from and try to guide the situation to a win-win solution, rather than getting caught up in unpleasant emotions.

2.3 Expressing needs

To successfully find a win-win solution, it's imperative to adhere to certain rules so that the conversation doesn't turn into a non-productive conflict and to increase the likelihood that the other side will feel empathy.

One of the core ideas behind expressing in a nonviolent way is being as objective as possible. This includes specific, nonjudgmental descriptions of situations, descriptions of one's own state (especially emotions and needs), and suggestions of possible solutions [Ros14]. Also, it is suggested to avoid using the word "no" as an answer to requests and rather presenting reasons for denying the requests (the unmet needs that a suggestion would not cover).

To move toward a solution, NVC recommends the following steps [Hah18, 194]:

1. Objectively describe the specific situation(s) related to the emotions and needs associated with the problem at hand

2. Express the emotions that you felt during these situations

3. Express the basic needs that these emotions imply

4. Ask if the other person would be willing to agree to your proposed solution, which should be thought up as to meet the needs of both sides.

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In a short phrase, it can be summarized thusly: "When I hear/see [situation summary], I feel [emotions], because I am needing [needs]. Would you be willing to [suggestion]?"

In practice, however, the way to express these components allows a wide range of options, letting one express them in a way that is natural to one's way of speaking. Sometimes, one might even forgo stating a part explicitly if it is evident in the context. For example, one might skip describing the situation if they're reacting to the situation as it happens. The main purpose is to promote empathy in the other person so that the problem can be resolved. [Ros12]

It's possible that even when one tries to communicate in an objective manner, the other side might hear judgment or a command, for example[Sac04]. In that case, it's recommended to check that the other person understood the informational aspect that was being communicated, particularly the needs. It's therefore advisable to check that the other side has this understanding before moving on. This can be done by asking them to relay what they heard and repeating oneself as many times as it takes to communicate the informational value behind one's statements.

▪ 2.4 Advantages and disadvantages

Although the method might seem simple, it can be hard to get right in practice, especially when one is just starting out.

A significant disadvantage to the method is the relative slowness of getting to the solution. Realizing the emotions and basic needs of oneself and of another can be time-consuming, as well as stating them until they are understood. Finding solutions that would work for both can also take some time. This method is therefore unsuitable for situations in which a quick solution is needed.

Another shortcoming of the method is the lack of a complete set of basic needs. Given the somewhat vague definition of basic needs, it can be hard to identify whether a given need is a basic need or whether it should be simplified further. The risk of identifying an overly specific need is that the landscape of possible solutions will be too narrow for there to exist a win-win solution.

Chapter **3**

Related psychological findings

3.1 Categorization of emotions

As mentioned above, emotions play a key role in the Nonviolent Communication process. While Rosenberg provides a list of emotions, it is not meant to be an exhaustive list [Ros03, 43–46], nor does it lend to visualization other than a textual list.

There are a number of emotion models that have been introduced over time and there is no scientific consensus on which model best represents human emotions. Below, I will discuss some of the leading models.

3.1.1 2D models

Some of the earlier dimensional emotion models, such as the Circumplex model [Rus80] or the Positive activation – negative activation (PANA) model [WT85], plot emotions in two dimensions. The Circumplex model uses arousal and affect as its axes, whereas PANA plots intensity of negative affect on one axis and intensity of positive affect on the other. The Yale Center for Emotional Intelligence promotes its own 2D model — the Mood Meter [moo] — as part of its RULER program, a program focused on teaching emotional intelligence to people of all ages.

Each of these models presents a mapping of a number of emotions to a 2D plane, with 100 emotion words having a precise position in Yale's Mood Meter. The downside of all of these models is that they map intense unpleasant emotions like anger and fear into the same area.

◼ 3.1.2 Ekman's basic emotions

In his widely cited 1992 paper, Paul Ekman proposes anger, disgust, fear, happiness, sadness, and surprise as the basic human emotions. He bases his theory on the universal recognition of facial expressions, proposing a set of criteria that basic emotions should meet, including, among other things, unique and easily distinguishable signals and physiology. He also discusses other proposed emotions, such as interest, contempt, guilt, and shame, arguing that the evidence for these is weaker and that more research is needed. [Ekm92]

◼ 3.1.3 Lövheim cube of emotion

Hugo Lövheim, a biology researcher, takes a different approach to emotion models. Noticing that it's mainly the monoamine neurotransmitters serotonin, dopamine, and noradrenaline that are associated with signaling emotions, he borrows the basic emotions described in Silvan Tomkins's affect theory and mapped them to the three axes that represent the levels of these neurotransmitters. [Lö12]

	Serotonin	Dopamine	Noradrenalin
Shame/humiliation	Low	Low	Low
Distress/anguish	Low	Low	High
Fear/terror	Low	High	Low
Anger/rage	Low	High	High
Contempt/disgust	High	Low	Low
Surprise/startle	High	Low	High
Enjoyment/joy	High	High	Low
Interest/excitement	High	High	High

Table 3.1: Mapping of emotions in the Lövheim cube of emotion

3.2 Categorization of needs

Just like emotions, needs also play a key role in Nonviolent Communication.

3.2.1 Rosenberg's list of needs

In his book, Rosenberg proposes a categorized list of needs, with the categories being autonomy, celebration, integrity, interdependence, physical nurturance, play, and spiritual communion. [Ros03, 54–55] While this list serves as a good starting point, it is also relatively unbalanced, with a wide range of category sizes and need descriptions. Category sizes range from 2 needs to 15 needs per category, while need descriptions start at 3 characters and go up to 93. The list includes 39 individual needs overall.

Tho Center for Nonviolent Communication (CNVC), founded by Rosenberg, offers a different, more thorough list, with 76 needs overall. [cnv] The descriptions for these needs are simpler than those in Rosenberg's initial list, with the longest being only 21 characters. However, the categories offered range even more in terms of the number of needs in each, from 2 in the smallest category, play, to 29 in the largest one, connection.

3.2.2 SCARF model

David Rock's SCARF model is focused on social needs only, breaking them down into the categories of status, certainty, autonomy, relatedness, and fairness [Roc08]. Given that both Rosenberg's initial list and CNVC's largest categories concern social needs, the SCARF model provides guidance on how to break them up into smaller subgroups.

In his article, Rock only proposes the categories and delves into the research and reasoning behind them. He does not propose a list of specific needs belonging to each category.

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■ 3.2.3 Maslow's hierarchy of needs and its extensions

In his 1943 paper, Maslow introduced a hierarchy of 5 different need categories: physiological, safety, love, esteem, and self-actualization. [Mas43] Like Rock, Maslow does not introduce a list of needs pertaining to each category, though he does give a few examples for each in his descriptions.

In the book *Respektovat a být respektován*, a book advocating an approach similar to Nonviolent Communication, the recommended model is Maslow's hierarchy of needs, extended by a "higher needs" category above self-actualization. [Pav08, 189–191] There exist other extensions, such as one with 8 categories, adding in the need for beauty, understanding, and transcendence [Sae09]. As with Rock's model, these models provide guidance on how to better categorize Rosenberg's or CNVC's uneven list of needs.

Chapter 4

User research

In this chapter, I will cover the preparation and execution of user interviews as well as the extraction of findings from these interviews into personas.

4.1 Research preparation

User research needs to be well-planned in advance in order to go smoothly. It's important to decide what types of people to talk to, how to find them, and what information one is looking to gain.

4.1.1 Goal

The purpose of organizing user research was to gain an understanding of the target group as well as to discover key problem areas in parenting suitable for fixing through Nonviolent Communication.

■ 4.1.2   Population sampling

Based on my goals, I wanted to limit the interviewees to parents with at least one child between the ages of 2 and 12 — that is, prepubescent, but old enough to be able to feel a range of emotions, have a range of needs, and have a range of ways to express their emotions and needs, including at least very simple speech. The reasoning behind not including teenagers was that the issues they deal with tend to be different from those of younger children. I chose to focus on younger children, because parents have much more influence over them and interaction tends to be much more common. I chose not to interview parents with only older kids, as memories of earlier years would not be as fresh and therefore their contribution less likely to be reliable.

Initially, I intended to select a diverse parent population through a screener, a set of questions designed to filter out potential participants [Goo09, 104]. I ran into problems quite early on, as there seemed to be very many potential variables that have influence on the types of problems parents run into (number of children, their ages, time devoted to children, location, income, ...). Undeterred, I narrowed down my options to parenting style, which I saw as a key differentiator, and age and number of children. However, the resulting questionnaire turned out to be too invasive, feeling more like a psychology quiz than a simple screener. This was because in order to get a sense of one's parenting style, some questions had to necessarily ask about one's approach to children.

At the recommendation of professor Jakub Franc, I changed my approach to a more experimental one, where I would find participants through snowball sampling (finding new participants at the recommendation of the initial participants) and increase the research population to around twice the one planned, to have a higher chance at finding differences despite not selecting for them at first. One advantage of snowball sampling was that participants were much more likely to trust me as an interviewer because they were recommended personally by an acquaintance of theirs.

■ 4.1.3   Research topics

The method chosen for the research was semi-structured interviews. To prepare for the interviews, I wrote up a list of topics to cover. This gave me enough structure to guide the interview, but also enough freedom to delve

deeper into more interesting topics that could come up and to guide the conversation in a more natural way, tying topics together.

The rough outline of topics was as follows:

- Basic information
    - Number of children
    - Descriptions of children, including age
- Everyday interactions
    - Yesterday
    - Usually
- Long-running problems
    - Approaches from both sides
    - Solution ideas and reasons for rejecting them
    - How both parties felt
    - The partner's role
    - Where they looked for tips and inspiration
    - Needs of both sides
    - What was hardest about finding a solution
    - How the solution was solved/what it's stuck on
- Other long-running problems
    - E.g. the worst thing the child did, or a situation where emotions were running high
- Ideas and hopes about the child's/children's future (missing from some interviews, as it was added later)
- Fears with regard to the child/children (also missing from some interviews)

4.2 Interview process

Given the snowball approach to sampling, only three participants were planned for the first round of user research, with the intention of gathering more over

time, through recommendations. This approach proved effective. In total, 11 interviews were conducted. Interviews were conducted in places chosen by the participants: homes, cafés, workplaces, and, in one case, online. Each interview was approximately an hour in length.

Each interview began with a relevant ice breaker, then moved onto a description of the goal of the diploma thesis and of the interview itself. Each participant was informed that the data gained through the research would be anonymized. They were asked whether their voice could be recorded, provided that the tapes would only serve to supplement notes and would be deleted after they were no longer needed. After giving or denying permission, the participant was thanked for taking the time to help and asked if they had any questions before the interview.

Afterward, questions pertaining to the research topics outlined above were asked. Interesting information was noted down on paper and often explored further later in the interview.

After exhausting the research topics, the interview participant was asked if there was anything they wanted to add. Afterward, they were asked how they felt and if they had any feedback they'd like to share. At the end, they were given a box of chocolates, thanked again for devoting their time, and asked if they'd like to be kept updated on the project via a mailing list.

(Most of the content of the interviews conducted cannot be included in this thesis in order to preserve the privacy of the participants. As the majority of user interview content turns out to be very specific to a person's daily life, family structure, and personality, there is a risk that a person could be identified based on the notes alone, even with names redacted. This risk is especially high considering that the snowball sampling method was used, and therefore certain participants know each other.)

◼ **4.3** **Persona creation**

To condense the findings into models that could then be used for design, I set about creating a set of personas.

To start the process, I went over my written notes with several highlighters, marking certain phrases based on the content they pertained to. This process

is referred to as "coding" [Goo09, 209–215]. After this coding was done, I wrote the coded bits up in an online document, categorized them by topic, and arranged them based on intensity or character according to the area I was looking at. Based on clusters and how they connected between variables, I created two main personas.

The main difference between the two seemed to come down to their general approach — whether they were taking into account what the child's wants and needs were, or whether their mind was more on what the child should do.

4.4 Personas

The personas I created are as follows:

4.4.1 Michael

- 5 y. o. Samantha

- Married, living as a nuclear family

- Conflict resolution:

  - Acknowledges Sam's feelings
  - Asks what she needs
  - If Sam's suggestion is unacceptable, asks if there is another solution she could think of
  - If not, gives a few choices
  - If Sam won't choose, lets her be with her emotions

- Sometimes, emotions escalate; Mike tries to take a deep breath then or leave, but sometimes, he can't and yells at or slaps the child

- Always apologizes afterward

- Inspiration:

  - Friends
  - Own childhood
  - Events he's attended (soft skill workshops and children's events)

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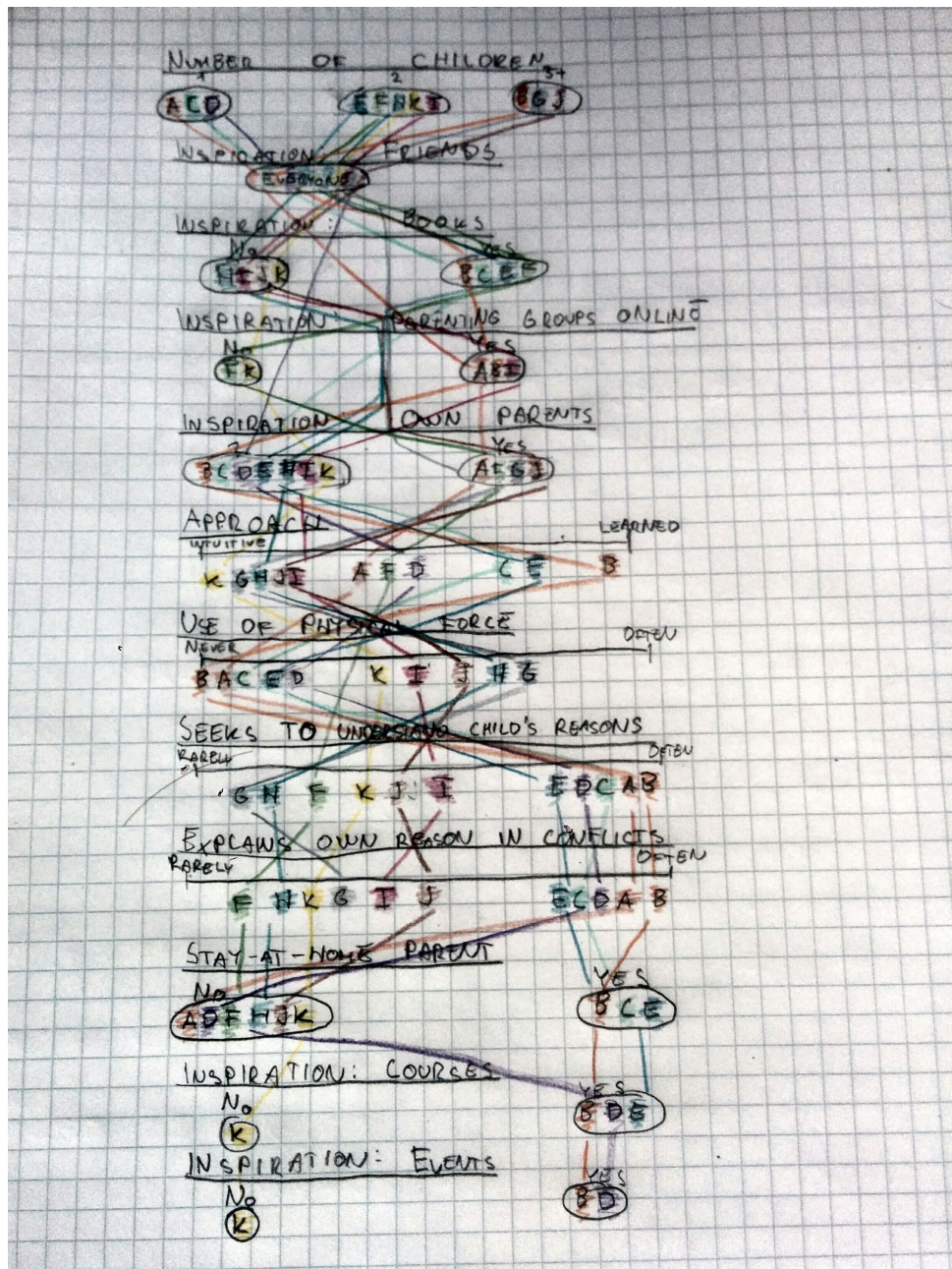
Figure 4.1: Diagram illustrating the variation found in user interviews, yielding persona clusters

- Facebook groups
- Was recommended parenting books, but only read a part of one

- Actively tries to be a better parent, though often finds it hard to find the time for that

- Open to a variety of sources for improving his parenting

4.4.2 Monica

- 9 y. o. Tom and 4 y. o. Simon

- Married, living as a nuclear family

- Conflict resolution:

  - Knows in her heart what the right solution is.
  - She tries to make her child see that it's the right one, explain why
  - If he rejects it, she tries to convince him through one of her techniques. This could be:
    - being playful
    - raising her voice
    - threatening with punishment
    - forcefully doing the action she set out to do (e.g. getting the child dressed or putting them to bed)
    - counting to 5
  - She doesn't like to use violence, uses it only when emotions get the best of her or when there seems to be no other option (like after counting to 5)

- Inspiration:

  - friends with children
  - parents

- Doesn't want to read books, finds them off-putting and often misguided

- Generally relies on intuition when parenting

Part II

Design and implementation

Chapter 5

Design workshop

Once user interviews were done and the data from them processed into personas, I needed to find a general concept for the product. In order to do that, I decided to run a design workshop, where the concept would be found through the design studio technique and a subsequent effort-impact analysis.

5.1 General scenarios

To prepare for the design workshop, I needed to prepare a quick rundown of all that was needed for brainstorming a general concept. Personas were a must, as well as a primer on Nonviolent Communication. What I was still missing, though, were a basic set of scenarios to describe the contexts and situations in which people would use the product.

As I wanted to keep the range of potential solutions broad, the scenarios I came up with were generic enough to only give ideas about the context and the interactions, without suggesting a particular form factor. The scenarios served more as a broad guideline than a strict flow that had to be followed.

The scenarios are summarized below, with the project referred to as "N" here.

Michael

1. Hears from a friend about a way to resolve tricky conflicts that he's having

2. Curious and eager, decides to give it a try during a bit of free time

3. N introduces the approach, gives a quick **rundown of the basics**

4. Mike is curious to learn more, asks N to **teach him each component in detail**

5. N teaches Mike **a bit of the theory**

6. Mike **confirms with N** that he understands the theory correctly

7. Mike has other things to attend to, tells N to leave the rest for later

8. Mike keeps the newfound knowledge in mind as he goes about his day, lets it influence his parenting

9. Mike often turns to N in his free time, asking for more training

10. On several occasions, Mike **asks N to help him with his specific problems**

11. Based on N's help, Mike tries to apply the newfound knowledge in real life, always **asking N what went wrong when the attempt fails**

12. Over time, Mike becomes more and more proficient in NVC, **turning to N for advice in how to apply NVC principles**

Monica

1. On several occasions, a friend of Monica's recommends N to her as a good way to resolve conflicts with children

2. Skeptical, Monica decides to look into N

3. Monica **asks N what it's for and what advantages it has compared to other approaches**

4. Still skeptical, Monica **wants N to prove to her that it can be effective.**

5. **N shows Monica how it can be more effective** than other approaches.

6. Curious whether and how NVC could work for her, Monica **asks N how she could apply it in real life**

7. N **walks Monica through a scenario relevant for her, making sure she knows how to avoid common pitfalls**

8. Monica decides to try the approach in a simple conflict with her son

9. Surprised by unexpected success, **Monica asks N to teach her how to apply NVC in other scenarios**

10. In Monica's bits of spare time, **N teaches her in bite-sized increments how to best deal with the situations she gets into**

⬛ **5.2 Workshop plan**

Given my nonexistent budget and short time for planning, I needed to assemble a team of volunteers for the workshop. Luckily, many of my friends were qualified for such a workshop and I ended up with a team of a friend with a Master's in Applied Positive Psychology, a former UX design classmate, and a programmer. (There were more potential attendees invited, including parents, but they couldn't attend due to scheduling conflicts.) The workshop was held at a conference room at the local technical library, with one attendee connecting remotely.

The general plan for the workshop was to last around 5 hours, with a lunch break in between. The schedule was comprised of a 10-minute intro, a 10-minute rundown of personas, a 40-minute introduction to Nonviolent Communication on a personal example, with enough time to elaborate on questions from attendees, then a shorter introduction to scenarios (10 mins), a write-up of problems in the form of questions beginning with the phrase "How might we" (15 mins), a lunch break (30 mins), followed by a short icebreaker exercise (10 mins) leading to a design studio (2 hours and 15 mins), culminating in rating each concept on an effort-impact scale at the end (15 mins).

These times served for general orientation; in practice, they were slightly different. There were both unexpected challenges and technical difficulties that caused significant delays. Fortunately, this was accounted for in planning and there was enough padding in the plan to accommodate all the activities and finish in time.

The design studio consisted of an introduction (15 mins) and then 3 iterations. The first two iterations were comprised of a 6-minute sketching session
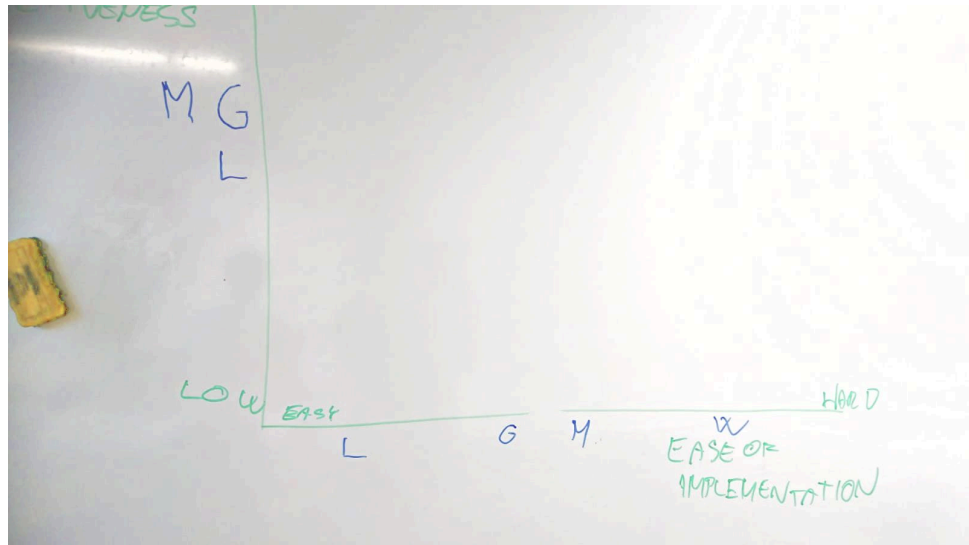
Figure 5.1: The concepts plotted on the different axes of the effort-impact scale. (The "W" is missing from the impact axes, with "L" chosen as the optimal solution. "Ease of implementation" refers to effort.)

and 6 minutes for the presentation and feedback of each concept in groups of two (12 minutes overall). The third iteration was the same, except the concepts were not presented in small groups, but rather to all attendees, and there was no time for giving feedback. The effort-impact scale exercise followed right after, with attendees deciding on the placement of each concept on a 2D effort-impact graph.

Materials used for the workshop as well as materials produced during the workshop are attached in the appendix.

5.3 Workshop results

The workshop resulted in four distinct concepts. To be brief and on-point, I'm only including the one that was considered to have the most impact for the least effort in this section. This concept formed the basis of later design. The other concepts are described in the appendix.

▪ **5.3.1 "The Celestial Parent Expert"**

This winning idea centered around giving parents something to guide them through Nonviolent Communication and motivate them to practice regularly. It would have a dialog with them, asking about conflicts with children, emotions of both parties involved, and needs of both parties. All this could be supplemented by materials explaining the theory, and remind them to have this dialog frequently, ideally every day. Over time, the NVC process should become second nature.

This concept was designed with the phone form factor in mind as to be available wherever and whenever, including right after difficult situations, as well as to have a greater chance to lead to habit formation, through mobile notifications as well as the reduced effort to record due to the increased availability.

Chapter 6

Prototype creation

6.1 Specific scenarios

With a general concept chosen, a more concrete idea of the interactions that would take place and the contexts in which they'd take place was needed in order to be able to come up with a more detailed concept. Given that in the scenarios I had in mind, the interaction between the user and their environment would be basically static, I chose to write up detailed scenarios rather than draw storyboards. In these scenarios, the name "N" is used to refer to the project.

6.1.1 First use — Monica

Scrolling through Facebook, Monica notices a friend of hers recommending N. Intrigued but skeptical, Monica decides to check it out. She takes a look at a few pictures and skims through the description and decides to give it a try, still with a dose of skepticism. **N greets her and shows her what it's for** — helping her resolve conflicts with her children, like sibling rivalries or technology addictions. **With her interest piqued, N tells Monica how she can find win-win solutions**, illustrating the concept with an example — there's a whole world of possible solutions and rather than picking one, it's best to **identify the best one that works for both parties**. How? By identifying the **core needs of each party and finding a solution that**

meets both needs. **N gives an example to illustrate**: Say that Jessie wants to play with her rocking horse, but you need her to go upstairs, as there will be people visiting downstairs. You could send her to her room, but you know Jessie has a need for independence and play. So instead, you could ask her for a suggestion on how else she could play. Perhaps she could take the horse with her. Or play with her dolls. Or play outside. Either way, she's happy and doesn't feel forced and you've solved the problem!

N asks Monica if she'd be willing to try it for a week. Monica agrees, just to give it a try, though she's still skeptical as to whether the method could work for her. **N asks Monica what time is good for her** — 8 p.m. generally works. **N then asks her if she would like to start that day with a recent conflict.** Monica doesn't really feel like it anymore (she has more to do and has spent quite a bit of time with N already) and leaves it until tomorrow, moving on with her activities.

◼ 6.1.2   First use — Michael

Michael hears about N from a good friend. He decides to try it as soon as he gets home. **N introduces itself, lets Michael know what it's for, how it works, and gives an example, just like in Monica's case.** Intrigued, **Michael asks N for more examples**. N asks Michael what would interest him. Michael asks for a topic, N replies, and after a few rounds of this, Michael really wants to give it a try. N walks him through the process (see below) for a recent conflict that happened with his child. Reflective about the specified emotions and needs and curious if his solution would work, Michael leaves N be, determined to try the solution he came up with the day after.

◼ 6.1.3   Nighttime diary — Monica

Since Monica promised to **try N for a week, N reminds Monica around 8 at night to record difficult situations**. Monica is busy at the time and **asks N to remind her in an hour**.

At 9, **N reminds Monica again**. This time, she's free. **N asks her how her day was, what event happened with her child. Monica tells N about a fight her children had over their toys. N asks her if she's happy with how it went** — no. **N asks her how she felt in the situation** — frustrated and angry — **what she needed** — peace and

quiet — **how she thinks each of her children felt** — sad and angry — **and what they needed** — entertainment. **It then asks her if she can think of other solutions that could have worked** — Monica doesn't want to take the time to tell N each one, so she just tells him keywords that she understands the meaning of. **N then asks whether she found a solution that might have worked** — not really. **N asks Monica what the reason is** — her children would never agree — **and if that doesn't imply another need on their part.** Monica **tells N she doesn't want to think about it anymore. N asks Monica whether she'd like to tell it about another event** — no, this was the only situation worth mentioning. **N says a polite and encouraging goodbye** and Monica moves on with her nightly activities.

6.1.4 Nighttime diary — Michael

Close to 9 p.m., Michael visits N, eager to catch up on a situation that happened in the morning that he hasn't quite found a solution for — his child was asking for the tablet, but Michael refused. **N asks what the situation was, Michael gives it a relatively thorough walk-through**. N asks about Michael's emotions at the time and, surprisingly, Michael finds it hard to name them. He goes for frustrated. **When asked for a need, he again finds it hard to specify his need.** He doesn't like N's suggestions, so he thinks of his own — the child's future well-being. **N warns him about choosing needs that specify a certain person or allow only a handful of solutions. Thinking over it again, he really needs peace of mind about his family's future.** He then tells N his child's emotions — sad, frustrated, slightly angry — and her needs — independence, playfulness, entertainment. **N asks him for possible solutions. After some thinking, Michael comes up with two: discuss tablet time limits and asking Sam if what kind of after-school club she might like to join. N tells Michael that it will follow up on the conflict the next day.**

6.1.5 Right after a situation — Monica

Overtaken by her emotions, Monica reverts to yelling and demands when her children made a mess in the living room and refuse to clean it up. She succeeds in establishing order, though through aggressive methods. Still reeling from the situation, she goes to the kitchen to prepare a meal. As she's waiting for the meal to cook, she **tells N the feelings and needs**

for both parties, still somewhat angry inside. As she records her children's emotions and needs, she feels a bit more empathetic toward them, loosening the control her emotions had on her. She realizes that she could have handled the situation better. She goes to apologize to the children, telling them her perspective as well as recognizing the emotions she realized they must have been feeling. Happy with the result, she returns to the kitchen and **tells N about how the apology went**.

■ 6.1.6   During a situation — Michael

Sam is throwing a tantrum about having to clean up her room, Michael's feeling really angry and needs a bit of time to breathe. He excuses himself and takes a bit of time to breathe. He takes a deep breath, but he's worried that his anger might return when he goes back to Sam's room and he's not sure how to resolve the situation. He **asks N how he should resolve the situation**. N asks him **what emotions he's feeling** — intense anger — **and what needs he has in the situation** — cleanliness, peace of mind. **N asks what emotions he thinks Sam is feeling** — sadness, tiredness — **and what unmet needs that might be suggesting** — playfulness. **N asks Michael if he can think of other solutions that might meet both needs — Michael lists two. N asks if any of those would work, but Michael isn't happy with either. N asks why** — Sam just doesn't want to clean her room. **N asks if the reason behind that might not imply another need** — Michael realizes Sam needs her independence. Without interacting with N any further, Michael goes to Sam's room and says that it's important to him that her place is clean, that he realizes she needs her independence and playfulness, and asks her if setting a timer and then cleaning up would work. Sam reluctantly agrees, arguing for a whole 15 minutes of play. **Michael returns to N to tell it how he resolved the problem**.

■ 6.1.7   Following up on a situation — Michael

The day after Michael's entry, **N asks him whether he wants to follow up on the situation and whether it's still relevant**. Michael does want to follow up — he's talked to Sam about her tablet habits, but they haven't been able to resolve the problem. Michael **goes to tell N about the new solutions he tried in the tablet situation he talked about before. N asks him about the new situation — what were the emotions this time** — calmness on his side, frustration and anger on Sam's side — **and**

whether he discovered that the needs he assumed were different —
not really. N asks Michael if he can think of other solutions to try — **Michael
has trouble coming up with any. N suggests that Michael ask
his child or other parents in an online Nonviolent Communication
forum.**

6.2   Hierarchical task analysis

From these scenarios, there seemed to be two key processes at play here:
recording a specific situation and familiarizing oneself with the product. In
order to have a better understanding of these processes, I created a hierar-
chical task analysis for each. The HTA charts are included in the appendix.

6.3   Sketching

Figure 6.1: The Crazy Eights brainstorming technique used for designing the
emotion picker

The HTAs provided a basic skeleton for the general user journey through

the app, while the scenarios provided information about the contexts in which the app might be used. Starting from those, I sketched screens roughly corresponding to the processes outlined in the HTAs and refined or redrew them based on the interactions implied by scenarios. These were rough sketches, so various elements were missing and no attention was paid to details.

On areas that I felt needed increased focus, I used the Crazy Eights technique [cra] — drawing 8 different concepts for a certain part of the scenario.

■ 6.4 Low-fidelity mockups
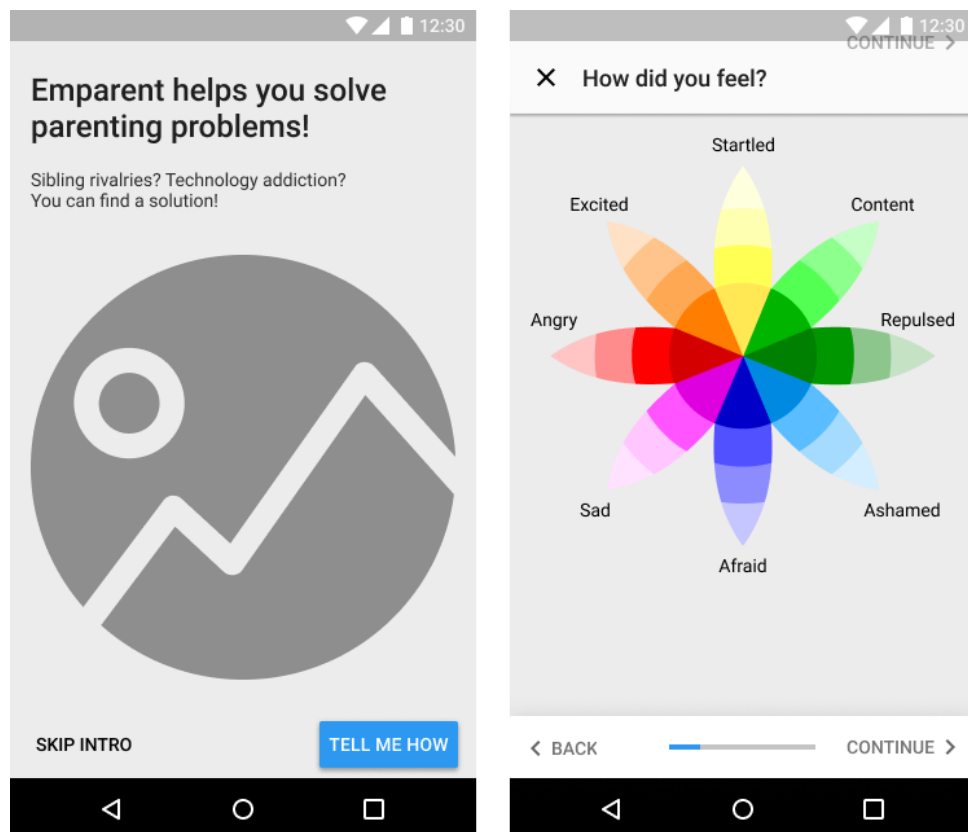
Figure 6.2: Two examples of low-fidelity mockups in English

I used a freely reusable mockup kit as a starting point for creating low-fidelity mockups, rather than a wireframing kit. This was done so that shadows could be used to separate elements from one another (e.g. indicate whether a button was floating above a list as opposed to being a part of it) and so that the resulting mockups would be more coherent than a wireframe

would be (as color and shape is a part of the emotion picker that I sought to test, the picker would stick out much more in a standard wireframe than in a basic mockup). Fortunately, the resulting mockups still communicated their relative low fidelity, through a very basic, stark look, through greatly limited interactivity, and through the use of image placeholders. (Additionally, test participants were informed about the prototype's fidelity.)

The tool used for the creation of these mockups was Figma, an collaborative online vector editor with prototyping features.

6.4.1   Emotion picker

One area that received special attention was the emotion picker. As it is a common mistake to mistake a judgment or thought for an emotion (such as "feeling like one doesn't matter" or "feeling like yelling at a person"), I wanted to restrict the user's choice to emotions only. That required finding an emotion model allowing for the widest possible range of emotions as well as finding a good mapping of emotions for that model.

The initial model that was considered was Yale's Mood Meter, as it mapped 100 emotional words to a simple 2D model (fitting for use on a 2D screen). However, after using Yale's own Mood Meter app, I quickly became frustrated with the way emotions like anger and fear were mixed.

Ekman's model was widely-referenced, yet it didn't present a clear set of emotions, with emotions like shame not included in the selection and Ekman calling for further research to be able to establish it as basic.

The Lövheim Cube of Emotion seemed to provide a model with a wide enough range emotions and with a firm foundation in neurobiology, which is why it was my choice as the model for the emotion picker. However, there was no existing mapping of emotion words to this emotion model (besides the mapping of the primary eight emotions). As a solution, I compiled a list of emotion words from a variety of sources, mapped them to the axes of the cube, and translated them into Czech, resulting in 56 emotional words overall. However, more research is needed to refine this model to better fit people's perceptions of the intensities associated with these words.

Also of note is the visualization of this model. The colorful "unwrapped" cone visualization was borrowed from Plutchik's emotion model. The emo-

tions are positioned so that emotions at opposite ends are polar opposites. The initial color mapping proposed in the low-fidelity mockup was a simple rainbow diagram, with anger being red and repulsion green (two common associations). However, in the high-fidelity mockup, the mapping was more refined, with the level of each neurotransmitter corresponding to a component of the RGB color space — specifically blue representing noradrenaline, red dopamine, and green serotonin.

■ 6.4.2   Need picker

With needs, I resorted to a simpler format: a grid of category tiles, where each tile opens a dialog listing the needs belonging to that category. Each item has a corresponding checkbox, allowing the user to select several needs in several categories.

The underlying data model was based on several sources. Individual needs were mostly taken from the Center for Nonviolent Communication's list of needs. However, rather than use their categorization, an extension of Maslow's hierarchy to eight categories was used instead, yielding a much more balanced set of categories. The need for independence, missing from Maslow's hierarchy, but present in both CNVC's and Rock's models, was added to better fit the underlying list of needs.

■ 6.5   Prototyping

To transform the mockups into an interactive prototype, Figma was used again, allowing for features like moving from one screen to another, showing an overlay on top of a screen, and scrolling a specific area. A feature that it didn't allow for was keyboard input, which was acceptable for this low-fidelity prototype. (A different tool should be used for the building of a high-fidelity prototype, one that will allow for keyboard input.) To create the prototype, screens were simply linked together, dialogs were presented as overlays, and important states were simulated through the linking of multiple screens.

For mobile prototyping, Figma offers a mobile app called Figma mirror. While it seemed promising at first, yielding acceptable results as the prototype was being built, as you'll read below, the final prototype was too slow
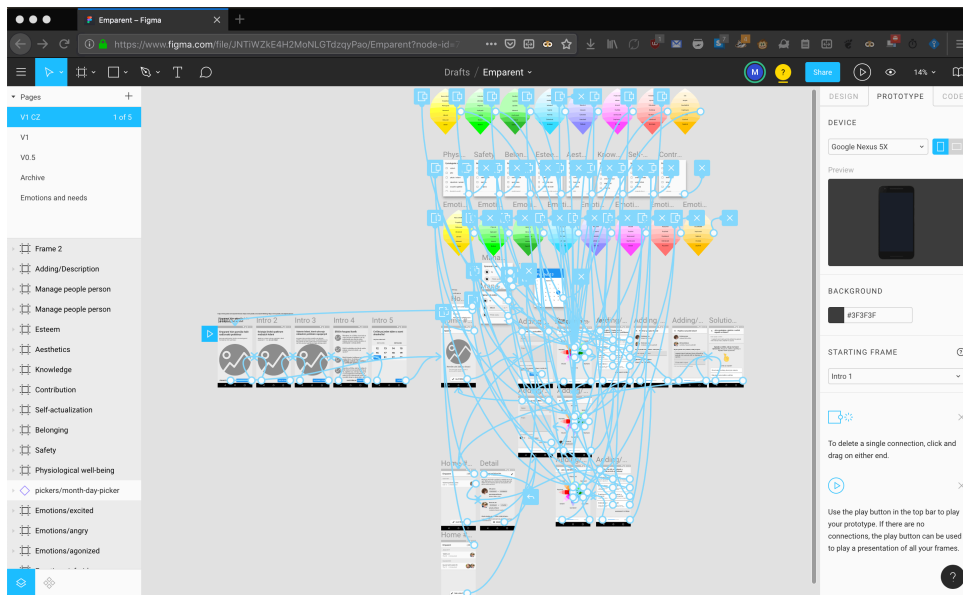
Figure 6.3: The prototype in Figma, showing the various points of interactions

to respond on a mobile device and was therefore tested on a laptop instead, where response time was significantly faster.

A link to the prototype is provided in the appendix.

Chapter 7

User testing I

In this section, I will present how the prototype mentioned in previous sections was tested and what the testing showed.

7.1 Participant selection

As with user interviews, participants were again selected using the snowball technique. Unlike with interviews, I was only able to convince friends (who met the criteria — in other words, parents of children of ages between 2 and 12) to participate. Other potential participants that I asked were either busy or did not respond. One of the participants also took part in a user interview earlier. However, as there was no clear concept for the product at the time of the interview and only the goal of the product (something to help solve conflicts between parents and children) and none of the research done until then was discussed, the influence of the interview on the user testing session should be minimal.

A much more pressing potential issue with the participant selection may lie in the fact that the participants were also friends. On the one hand, this seemed to increase their comfort in expressing their mind (this may be simply because of the personalities of these particular friends). On the other hand, though, the results are likely to be biased in ways that I am blind to. While the results of the testing have proven more than adequate for finding core flaws with the app itself, I intend to conduct tests of higher fidelity

prototypes with participants that I don't know personally.

■ 7.2   Testing process

The user testing session had a simple structure of an introduction, task completion, and a short post-session interview. Tests were conducted in the comfort of each participant's home.

■ 7.2.1   Pilot test

Before the tests were conducted, a pilot test was held with a friend that didn't fit the selection criteria, to uncover any flaws in the tasks, the prototype, or any other part of the test. Thanks to the pilot, a few mistakes were found and corrected in advance.

The most significant change that had to be made was the device on which the prototypes were tested. Although Figma advertises Android support and their Figma Mirror Android app supports prototyping features, in pilot testing, the prototypes turned out to respond too slowly to interact with normally. (When initially testing with much fewer screens as I was building this prototype, this problem didn't seem nearly as pronounced and went away once each screen was cached.) Thankfully, Figma also has a desktop interface for mobile prototyping, so the testing was done on a laptop device. While this may have led to a decreased chance of finding mobile-related usability problems, these should be caught in tests of later, more interactive prototypes, where touch targets will more accurately reflect those in the final app and more advanced interactions like text input will be possible.

■ 7.2.2   Test introduction

As part of the introduction, participants were told what the goal of the user test was and what to expect. They were informed that it's only a rough concept being tested, that they should pay no attention to the graphics of the prototype, and that some portions of the prototype might not be interactive or may not be interactive in the way they would expect. They were then told

that they would be given tasks and that it'd be helpful if they thought out loud. They were also informed that I would only answer questions related to their assignments, but not related to the prototype itself, as revealing information up front would be problematic. I assured them that it's the concept being tested and not them, and asked if I could record the session .

■ 7.2.3 Test scenarios

After either being granted or denied permission, it was time to move onto the tasks.

The test scenarios were presented in Czech, as was the prototype. Each part of the scenarios (including each list item in the first category) was presented separately as the participant went along. For the purpose of this thesis, here are English translations of the scenarios:

(The category headings presented below were not presented to the participants. Rather, they're presented here for easier reading.)

LFT1 **First use**

You were scrolling through Facebook one night, noticed a friend recommending this app for parents. You were intrigued, but skeptical. You installed it to give it a try. You open it up.

a. At first glance, without clicking, what is your first impression? What do you think the app is for? Do you think you'd have a use for this app? What would you still like to know about the app?

b. How does this app work? You may interact with the prototype now.

c. Can you relate to the example given?

d. You're willing to give the app a try. Commit to trying the app every day in the evening (after your kids have gone to sleep)

LFT2 **Daily log**

You'd like to find a solution for a problem from yesterday in the evening. (You were too tired to record it that day.) One of your children, Charlie, wanted to play a computer game and didn't want to go to sleep. You felt frustrated and angry, because you needed your peace and quiet, but

also a feeling of security that Charlie will do alright at school tomorrow. You told him "It's 10 o'clock already - time to sleep!" in a strict voice, but he only replied "Yeah, just hold on a sec" and continued playing. After a minute or two, you angrily told him in a raised voice, "that's enough, go to bed!" and took away the computer from him. Seemingly angry and hurt, Charlie went to brush his teeth, keeping silent with an angry look on his face all the way through to falling asleep. He still seems a little mad today and you're feeling sad about the way it went. You'd like to write up the situation so that you can handle it better next time.

LFT3 **Follow-up**

You tried the solution that you thought up, but it didn't work — the situation ended similarly to the way it ended last time. You'd like to record this situation too, as new information related to the previous situation.

▇ 7.2.4   Closing questions

After all tasks were completed, I conducted a quick friendly interview with the participants, asking:

- ▪ What is your impression of this app?

- ▪ Will you use this when it comes out?

- ▪ What bothered you the most about this prototype?

- ▪ What did you enjoy the most?

- ▪ Anything else you'd like to add?

▇ 7.3   Test results

Below are some of the problems found during user testing, with the number of times they were found provided in parentheses. Testing was done on 3 parents, all known to the tester.

LF1 **The third slide of the onboarding carousel seems too lengthy and confusing. (2/3)**

Solution: Reword the message on the third slide to be clearer and more concise and/or split the message across two slides.

LF2 **The time picking slide is unexpected and feels daunting. (2/3)**

Solution: Present the time picker at a later time, after the user has gone through adding a conflict at least once, and redesign it to fit in that context. For example, present a dialog after the user has added their first conflict, asking them when they would like to be notified.

LF3 **It's unclear what the person is committing to on the screen with the time picker. (2/3)**

Solution: Along with redesigning the time picker, it's important to reword the time picker to make it clear that the time chosen refers to the time app notifications would be shown.

LF4 **It's unclear that the time picker slide is a time picker. (1/3)**

Solution: Same solution as above

LF5 **Adding a text description on a mobile device would be tiring. (2/3)**

Solution: Make the text description optional, and make it clear that it is strictly optional

LF6 **It seemed at first as if the description field would be passed on to an algorithm or a person that would suggest a solution. (2/3)**

Solution: As part of the onboarding process, mention that the user will find the solution themself.

LF7 **Without a concrete example, it was hard to understand the point of the first 3 slides. (1/3)**

Solution: This might be improved by introducing illustrations that suggest a particular situation to these slides.

LF8 **If the participant was dealing with their own problem, they would want to write up a problem in advance, to think through it. (1/3)**

Solution: Conversation planning does not fit the scope of the app itself, which is centered around reflecting on situations. Conversation planning might be considered as a feature in the future.

LF9 **The emotion model didn't fully correspond to the participant's understanding of emotional words and the way they relate to each other. (2/3)**

Solution: Refine the emotion model and the particular Czech words associated with each rung of the emotions.

LF10 **The participant thought that certain important emotions were missing (e.g. anticipation). (1/3)**

Solution: Same solution as above

LF11 **A large amount of needs seems to pertain to the situation presented. (1/3)**

Solution: The participant noted this, but opted to select only a few needs anyway. This indicates that perhaps this won't be a problem in practice. Further user tests, ideally allowing a greater degree of interaction, are needed to find whether this is a problem. If so, there could be a note about choosing only the most relevant needs, but worded carefully as not to discourage the user from selecting all the needs they find relevant.

LF12 **The participant intends to click "Mark as resolved" right after thinking of a potential solution. (1/3)**

Solution: As this button is intended to be clicked only after a situation has been resolved in reality, not only in theory, it should be moved elsewhere as to not seem related to solution ideas. Given that this button was intended to be used only in case a person is recording a successful resolution of a conflict, the button can be moved to earlier in the process, such as the initial screen with the description.

LF13 **The participant input the situation under today's date rather than yesterday's date. (1/3)**

Solution: This might have been a problem with the task itself rather than the UI, as the participant made no effort to change the date and didn't seem to give a thought to the fact that the situation occurred the day before. In further tests, the point that it was yesterday should be stressed.

LF14 **The participant cannot think of any solution meeting the needs. (1/3)**

Solution: When asked to think of solutions, the participant said they couldn't think of any that would meet the needs of both parties. They stated that they would type in any word so that they could see what's on the next screen. Here, it might be advisable to present relevant topics from the parent forum for inspiration (originally intended as a simple complement to the app, rather than as a part of the app itself). However, this is too ambitious for the first release and would require a forum full of content. It will have to be added in a future release.

LF15 **It's unclear what "Check the needs you found" means. (1/3)**

Solution: Reword the button to be clearer — e.g. "Add needs that you missed".

LF16 **Specifying a person's gender pronoun seems superfluous. (2/3)**

Solution: While the purpose of choosing a gender pronoun for each person was lost on the participants, the purpose of it was to make copy throughout the interface sound more natural in languages that use different word endings depending on gender. While this isn't a problem in English, and the pronoun picker would not be presented in that language, it seems important for Czech, simplifying phrases like "Michal se cítil/a smutn, protoe poteboval/a" to "Michal se cítil rozzloben a smutn protoe poteboval". A solution might be to try to guess a person's gender automatically based on their name.

LF17 **"Male"/"Female" would seem like more natural wording than "He"/"She". (2/3)**

Solution: The wording was purposely picked to be inclusive. A gender picker would not suffice, as the preferred pronouns of genderfluid individuals could not be accurately inferred from gender specification. Given that all participants were able to figure out the functionality of the picker, a rewording does not seem necessary.

LF18 **It's unclear how to interact with the emotion model at first. (2/3)**

Solution: Use affordances, such as animation, to suggest how to interact with the model.

LF19 **It's unclear whether one can pick several emotions at once. (2/3)**

Solution: In testing, one participant initially chose only one emotion at the first screen devoted to emotion picking and only in retrospect thought about whether several emotions can be chosen at once, stating that he would go back and try it. Another participant wondered the same thing right before picking the first emotion, and seemed sure that several emotions can be picked after a section listing the first emotion that was chosen appeared (implying that more than one emotion can be chosen). Ways to communicate that several emotions can be chosen should be further explored in the creation of a more interactive prototype.

LF20 **The participant seemed to find the ideas in case of feeling uncertain matter-of-fact. Despite being unsure about their solution, they scrolled through the page and then clicked on "Done". (1/3)**

Solution: Present the ideas for what to do in a more alluring way.

45

Chapter 8

High-fidelity mockups

HF.png HF.bb
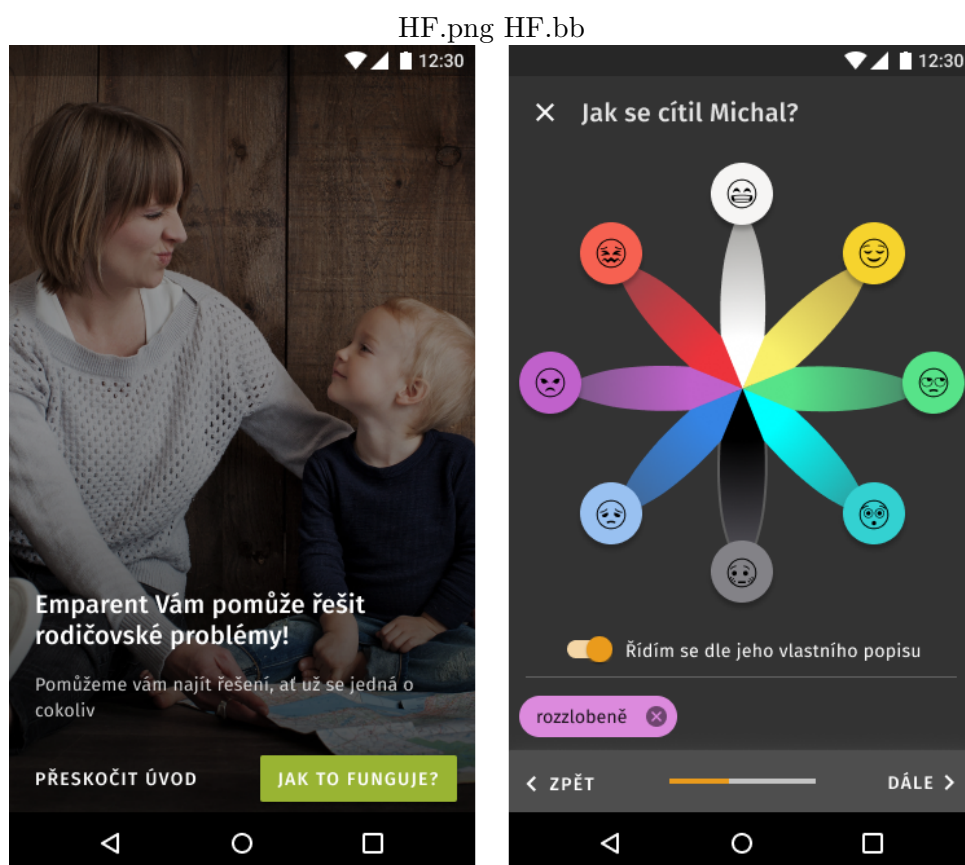
Figure 8.1: Two examples of high-fidelity mockups in Czech

In order to prepare for the creation of a working prototype, it was necessary to create high-fidelity mockups that would more accurately reflect what the end result should be like. Aside from fixing the problems found above, it was

necessary to factor in color and typography.

■ 8.1   Visual design

The app uses a **dark theme**, as the expected time to log a situation is at night. (A light theme may be added in the future.) The visual style of the app is meant to be **warm, friendly, and inviting**, using green as a primary color and orange as a warm secondary color.

The font used throughout the app is **Fira Sans**, a humanist typeface by noted font designer Erik Spiekermann [But14]. A humanist typeface was chosen to communicate warmth and friendliness (in sharp contrast to the default Roboto, a neo-grotesque typeface), as well as to increase readability with features like open counters and clear differentiation between a lowercase L and a capital I. [Mar14]

The emoji icons come from the open-source Emojitwo icon set [Emo18], chosen for their high expressiveness and being black-and-white. A black-and-white icon set was desired for emotions as to avoid distraction through featuring unnecessary elements (e.g. background gradients or odd emoji shapes), to better fit the colorful emoji picker, and to increase contrast. The "shame" icon had to be created as a derivative work, as no emoji in the set captured this emotion well.

The app adheres to the **Material Design guidelines** and uses the **Material icon set**. Though Material Design is a design language native to the Android ecosystem, it is fit to be used on iOS as well, with Google offering guidance on the tweaks that are needed to be made to fit the platform [mata]. As the tweaks are quite small, separate mockups for iOS were not needed.

■ 8.2   Naming and branding

After some deliberation, the name "Emparent" was chosen for the project, as a blend of the words "empathy" and "parent". This alludes to the app's method of finding solutions to problems through mutual empathy.

The logo for this app consists of two hearts, one small one large. That is to represent the compassion in both the parent and the child that the app aims to help encourage.

Chapter 9

Implementation

9.1 Technologies used

The technology used to create the mobile app is **Flutter**, a mobile application framework for building cross-platform apps.

With regards to user needs and user friendliness, the choice of this technology had several key advantages:

- The finished app would be **usable on both iOS and Android** [flub], allowing any choice of device on the side of the user. (Learning the separate native technologies and writing code for each would be too time-consuming for this work.)

- **Animations and interactions** would be fluid, as Flutter is optimized to run at 60 frames per second. [fluc]

- **State management** would be simplified on Android. With it being easier to save state on the developer side, there would less chance of making a mistake that would lead to the user losing his data.

- There would be potential for an **easy web app port**. As of the time of writing, an official library allowing building Flutter apps as native web apps is in active development [Jba18]. Having a web app would be a good complement to the mobile app for easier text input when a laptop is at hand.

User data is saved only locally into an SQLite database through Flutter's SQFlite library. Simple user preferences are saved separately, through a third-party Shared Preferences library, which is responsible for saving to the platform's native app preferences file. Saving locally made it simpler to avoid problems regarding user privacy, as the user would be the only one capable of accessing the data produced in this app.

■ 9.2 High-fidelity prototype

High-fidelity mockups were created in order to have a clear idea of what each screen should look like in the final product. A high-fidelity prototype was needed to test not only the chosen design elements, but also interactive components that could not be tested as part of the low-fidelity prototype due to technical limitations. Having prior experience with the advanced prototyping tools Principle, Framer.js, Axure, RelativeWave Form, and Pixate, I found that each of these solutions had serious shortcomings in terms of meeting my needs. The problems ranged from the resulting prototypes being too slow to the prototypes running only on iOS or working with only a certain piece of software for importing images. Given that Flutter was already chosen as the technology for writing the app and that Google bills Flutter as acting as "a productive prototyping tool" [flua] in addition to being a solid development framework, I decided to use the implementation of the app itself as a high-fidelity prototype.

■ 9.3 App structure

Flutter prescribes a reactive way of building apps. Apps are built out of components called widgets, which have two types: stateless and stateful. A stateless widget is a static, unchanging component, whereas a stateful widget is a component that keeps track of its state and redraws when the state changes.

The app's code, which resides in the `lib` folder, is therefore structured thusly:

- ▪ `main.dart` is a stateless widget that serves as the entry point of the

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app. The application theme and the navigation paths to key screens are defined here.

- **Individual screens** are, for the most part, stateful widgets (except the onboarding screens, which is a stateless widget) and reside in a folder called `screens`.

- **Custom widgets** (including dialogs) that are used across multiple screens are defined in a `widgets` folder.

- **Data structures** independent of the user interface are simple classes, not widgets, and are stored in a separate `models` folder.

- Classes related to the **management of user data** are also not widgets, but rather helper classes that communicate with the SQLite database or are responsible for retrieving and saving local preferences. These classes interface with the *sqflite* and *shared_preferences* libraries respectively and are stored in the `database` folder.

- Classes related to **app localization** are stored separately, in an `l10n` folder. Dart recommends writing a getter for every localized string in a single file. These strings are then imported into a separate arb file via a script in order to allow for translation into other languages. At the time of this writing, the app is available in Czech only, but an English translation is underway.

- Widgets and classes related to the **emotion picker** are stored separately, to allow the picker to be separated into a library later on. The intention is to allow other apps to use the same emotion model.

- **Assets** (mostly images) **and fonts** are stored outside the `lib` folder, in folders named `assets` and `fonts` respectively.

■ 9.4 Complementary services

To compensate for functionality that was better suited for the web rather than being in-app, a few complementary services needed to be created.

■ 9.4.1 Forum

As a social aspect was important for people represented by the Monica persona, it seemed at least a rudimentary forum was needed. To avoid complications arising from self-hosting an online forum (such as hosting costs,

installation, technical maintenance, and legal duties), Reddit was chosen to host the app's forum.

Reddit is an online service allowing anyone to create message boards, called "subreddits", centered around a specific topic [red]. The maintainer of each subreddit gets to set the rules of conduct for that subreddit, choose whether the subreddit is open to the public or not, and has the power to delete posts and comments. The added benefit of Reddit compared to a traditional forum is that posts and comments can be upvoted and downvoted, thereby highlighting the most useful answers to questions and hiding any hateful or spam comments through crowdsourcing.

9.4.2 Website

A complementary website was created to serve several purposes:

1. Finding willing participants for further testing

2. Hosting materials more appropriate for the web (such as links to recommended resources)

3. Promotion of the app once it's released

The website was written using the Hugo framework, a static site generator. This technology was chosen not only for its speed and ease of implementation, but also because GitLab, the repository where Emparent code is being hosted, offers free hosting for Hugo sites [hug19].

Figure 9.1: The homepage of the project website

Chapter 10

User testing II

10.1 Participant selection

As mentioned above, the website that was created was intended as a source of participants. While still using the snowball method to get to participants, the hope was that, by allowing people to share information about the project easily, a larger and more diverse set of people with no direct connection to me could be found. That proved right, with over 20 people from various parts of the Czech Republic signing up to participate in testing.

When the website was launched and shared, implementation of the app itself was only in beginning stages. For that reason, interested participants were sent an email detailing the current state of the project. Once most of the app was implemented, an email was sent to each person who signed up and was eligible for testing. (The requirements were speaking Czech and having a child between 2 and 12.) Two variants of the email were created — one for those in Prague and one for the others. Prague residents were asked to participate in a user testing session, whereas others were asked to participate in a diary study.

Unfortunately, only 4 people out of the 24 that signed up responded to this email or to the follow-up email that was sent a few days later. 2 were willing to participate in diary studies, 2 in live user testing sessions. Despite drawing interest, the people signing up at the website did not seem to have enough motivation to participate once the app was ready. It's impossible

to tell why people weren't interested — they might have lost interest over time, the website might have set different expectations, or perhaps the emails themselves were poorly worded. (Additional research would be needed to uncover the true reasons.)

Under great time constraints, I was able to find 2 additional participants for diary studies and 3 for user testing. Unfortunately, one potential user testing participant had to drop out due to time constraints. In the end, 4 people took part in user testing and 4 in diary studies.

■ 10.2 Testing process

The app was tested in much the same way as the prototype was, with a few key differences:

1. The app was tested on a mobile device, and therefore touch interaction could be properly tested.

2. There was enough time between the first 3 tests to allow for the biggest problems that were found to be fixed in time for each later testing session.

3. Tasks were tweaked based on changes that were made to the app's design.

4. Instead of being given a specific situation to record, participants were asked to come up with and subsequently record a situation from their own life. This was done to check whether the app would be applicable to real-world scenarios and to see how easy it would be for a person to recall a past situation and empathically infer emotions and needs.

■ 10.2.1 Updated test scenarios

HFT1 **First use**

You were scrolling through Facebook one night, noticed a friend recommending this app for parents. You were intrigued, but skeptical. You installed it to give it a try. You open it up.

a. At first glance, without clicking, what is your first impression? What do you think the app is for? Do you think you'd have a use for this app?

b. How does this app work? You may interact with it now.

c. What is your impression of the intro?

HFT2 Daily log

Can you think of a recent problematic situation with your child? Can you describe it to me?

Now I'd like to ask you to please record the situation in the app.

HFT3 Follow-up

You tried the solution that you thought up, but it didn't work — the situation ended similarly to the way it ended last time. You'd like to record this situation too, as new information related to the previous situation.

HFT4 Custom need (This scenario is used only if a custom need hasn't been added during the daily log task.)

You realize that you left out your need for completion in the first situation. Please add it to that situation.

HFT5 Resources

You'd like to learn more about the method behind this app. What would you do?

HFT6 Return to intro

Now you'd like to view the introductory photos and description that you clicked through at the beginning of this session again.

10.3 Problems found

10.3.1 Participant 1

HF1.1 The participant fails to select another person, thinking that the person is automatically selected after being added.

Solution: Prevent a person from proceeding until at least one other person has been selected, show an error message in context about at least 2 people needing to be selected.

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HF1.2 **The participant has trouble figuring out that the circles representing different emotions are supposed to be dragged and clicks them instead.**

Solution: Rather than interpreting a tap as a short drag gesture, don't let it register as a way of picking an emotion and show a message about the circle needing to be dragged instead.

HF1.3 **The participant wasn't sure whether she was picking her needs or the needs of her child**

Solution: The participant understands what was meant once she reaches the same section related to her child. This indicates that, if people have doubts about what the section is referring to, they will understand during their first run of the application. Therefore, no fix is needed.

HF1.4 **On the needs screen, the participant wasn't sure which need groups she already read through.**

Solution: Indicate which need groups a person has picked needs from already.

HF1.5 **When adding a custom need, the participant thinks aloud that the need doesn't have to be as general as the others are.**

Solution: Given that the app wants to encourage picking universal human needs only, it needs to be made clear to the user that that their custom needs should be broad enough to be applicable to the general population. A message should be added to the custom need dialog.

HF1.6 **The button "Follow up on situation" is interpreted as a way to record the same situation after a bit of time.**

Solution: Reword the button to "Add a related situation" to clarify the button's meaning.

■ **10.3.2 Participant 2**

HF2.1 **The participant finds the jump between the colorful onboarding screens and the empty screen of the situation overview jarring.**

Solution: Add a graphic to the empty screen, along with a message asking for a situation to be added.

HF2.2 **When recording a situation, the participant uses the up button, thinking it will bring him a step back in the process.**

Solution: Change the up button icon to a close icon, also permitted by the Material Design guidelines. [matb]

HF2.3 **When adding a description, the participant cannot figure out how to dismiss the keyboard.**

Solution: Change the action button on the keyboard from newline to done, via Flutter's inputAction attribute for text fields. [inp]

HF2.4 **Participant proceeds by selecting a third person involved in the situation, but not his son, who was also involved.**

Solution: This is the second time this problem has happened, suggesting that the previous solution didn't go far enough. Checkboxes should be added to indicate selected people. (Previously, they were only indicated by a highlight, as the Material Design guidelines suggest [cho].)

■ **10.3.3 Participant 3**

HF3.1 **The participant doesn't understand the arrangement of the dialog for managing people at first, being confused about whom each gender picker is associated with.**

Solution: Add separators between list items in the dialog.

HF3.2 **The participant is not satisfied with the selection of emotions, desiring to pick stubbornness.**

Solution: Given that stubbornness is not an emotion, the app behaves as it should.

HF3.3 **The participant is unable to add a custom need.**

Solution: The participant did not even try scrolling on the need selection page (though she has previously, in passing, with a cut-off tile indicating that one could scroll), instead simply clicking through the individual pages of the situation, trying to click on places listing currently selected needs, and then giving up. As all other participants were able to find the functionality and as it is intrinsically tied to the need picker, this functionality will remain in the need picker unless more people have the same problem. It may be that the artificial context in which the task was being performed made it less likely for the participant to think of the place for adding needs.

■ **10.3.4 Participant 4**

HF4.1 **The participant doesn't know what the title should be, leaves it blank.**

Solution: Mark the title as optional, label it "Untitled" when there's no title.

HF4.2 **The participant finds the colors relating to the emotions misleading.**

Solution: While some of the color choices are not generally associated with the emotions they represent, they correspond to the biologically-related emotion model chosen for the app. The hope is that the colors may better correspond to bodily sensations felt by the person and therefore provide better insight to the user. The color scheme therefore won't be changed.

HF4.3 **To look at the selection of emotions without picking one, the participant has to drag an emotion handle, choose an emotion, and then dismiss that emotion.**

Solution: When an emotion handle is being dragged, show an X icon and a "Dismiss" label below the emotion picker, where the handle can be dragged to prevent a selection.

HF4.4 **The participant believes that the example video was chosen based on his input.**

Solution: Change the wording of the "View example" button to "View general example".

■ 10.3.5 Participant 5

HF5.1 **The participant does not notice that clicking on recommended resources opened a browser window in the background, as indicated by a "toast"; a toast is a Material Design UI widget providing information and, in this case, a button to open the background app.**

Solution: Use an in-app browser, opening links in the foreground.

■ 10.4 General patterns

One interesting pattern that showed strongly during this round of testing was that most participants had trouble imagining what the solution could be in their situations. In two of the sessions, the participants were disappointed when the example video was not relevant to the situations they recorded. In

one session, the participant skipped the video, but wasn't satisfied with the solution she came up with. In the future, it might be advisable to create more example content to cover a broad range of problems, rather than have a generic example of the approach.

Another notable aspect is that two of the participants did not give much thought to the emotions and needs, with one choosing "respect" for all three people involved in a situation that was seemingly about much more, based on her description of what happened. This indicates lower ability to recognize needs and emotions. Thought should be given on how to promote this ability, though it might not be possible in the limited scope of this app.

Chapter 11

Diary studies

To discover whether the app helps with what its intended goal was — solving conflicts involving one's own children — a longitudinal study was needed. Specifically, the diary study method was chosen, with participants logging their experiences with the app over a period of two weeks.

11.1   Participant selection

As with previous studies, only parents with at least one child between the age of 2 and 12 were chosen. Unlike with user testing, it wasn't necessary to meet with the participants to conduct this research. This widened the field of potential participants to any Czech speakers. (Czech was required in order to be able to use the application, with an English translation not being ready at the time.) In the end, two participants were from Prague while two others were from other parts of the country.

11.2   Process

I contacted all participants collected from the website that were from cities other than Prague. (Prague residents received an email about user testing instead, with the plan being that they would be asked to participate in the

study at the end of a testing session.) Two participants were recruited this way, while two others were found through personal connections.

The process that followed was mostly inspired by the Nielsen Norman Group's advice on the topic, consisting of planning, briefing, a logging period, a post-study interview, and data analysis [nie]. Before starting the study, each participant was briefed over the phone or video chat, based on their preference. They were told what was being asked from them, instructed on how to install the app, and told how the app works (including information about usability problems that were not resolved at the time). As usability was not being tested as part of this diary study, it was important that the participants knew how to use the app. As part of the brief, each participant was told that recording every day was key, as I needed complete data, and that I would remind them if they missed a day.

In the succeeding two weeks, the participants regularly recorded situations in the app daily and filled out a short online form about their usage. Whenever a participant failed to do so, they were politely reminded via an email and asked for a reason. One participant consistently had trouble making the time to use the app and record, and though she kept contact, she dropped out of the study for lack of time.

After the logging period, each participant was asked to sit down for a short interview to discuss their experience. One participant was unable to find a fitting time, so the interview took place through an email conversation.

▮ 11.3 Form

The form that participants were asked to fill out daily included the following questions:

- Today, did you solve any of the conflicts recorded today or earlier? ["Yes" / "No" / "Other..." as an open answer]

- Today's use of the application changed your view of at least one situation [1-4, "Strongly disagree" as 1, "Strongly agree" as 4]

- Did you notice any changes to your approach with your kids? If so, which ones? [Open answer]

- The app Emparent played a key role in today's conflict resolution [1-4, "Strongly disagree" as 1, "Strongly agree" as 4; question shown only if the answer to question 1 was "Yes"]

- Anything else you'd like to share? [Open answer]

11.4 Final interview questions

The final interview was centered around the following questions, with room to ask more follow-up questions were needed:

- In what way did the app help you?

- What problems did you run into in using the app?

- What is your impression of the method that the app advocates?

- What are you missing in the app? For what reason?

- (Questions related to the submitted form entries, different for each participant, asking about specific reasons.)

- Did you ever take a look at a previously recorded situation? In which instance?

- How often do you think you'll be using the app going forward?

11.5 Results

One participant, found through snowball sampling, dropped out, with only two entries recorded over a two-week period. In the first week, the participant cited no situations to record as the reasons for not recording, stemming from a lack of problematic situations and not seeing the child very much on certain days. In the second week, the participant cited a lack of time, choosing to drop out of the study.

The other participants recorded on most days, though some have skipped a day or two. The quantitative data collected, summarized in the tables in

this section, shows that the app might not have been helpful on all days of the study, but that for every participant, it played a significant in helping solve a problem they recorded.

In the notes she submitted, participant 1 cites noticing her automatic reactions, an increased drive to find solutions, and changing her point of view as changes she noticed while using the app. She also notes that her app usage was not very focused, as she had a sick son for most of the duration of the study. Unfortunately, she was unable to participate in a post-test interview before the writing of this thesis, so detailed reasoning behind her recordings is unknown.

Based on their answers, participants 2 and 3 found the app considerably more useful than participant 1. From the qualitative data they submitted as part of the form as well as from the post-test interviews they took part in, it was clear that the app had a strong effect on how they approached situations. For participant 2, the main draw was having a very simple and clear set of steps to follow during a situation, with the app reinforcing that process. For participant 3, the key realization was a focus on her own emotions and needs, rather than just those of the child. She also appreciated having the emotions, needs, and ideas recorded, as it helped her think through them. Both participants have noted that they looked at other resources in the past, namely the book *Respektovat a být respektován* for participant 2 and a free video series from Nevýchova and certain psychology books for participant 3. While those resources helped shape their views, the app provided a different kind of help for them. Both have said that they would recommend the app to friends and that they plan on using the app going forward, and neither could think of any problems they ran into while using the app.

As part of the post-test interview, I also asked about looking at previously recorded situations, to know whether the topic detail screen was useful. Participant 2 noted that she did look at the screen, mainly to tweak the recorded situations (adding or changing needs, changing the recorded emotions based on answers from the person in question). Participant 3 noted that she returned to the screen mainly to look at the ideas she came up with, though she also visited it to follow up on a situation or add details.

Participant	Days nothing solved	Days something solved	Other
1	10	2	1
2	3	6	3
3	6	7	1

Table 11.1: Recorded problems solved during diary study

Participant	Strongly disagree (1)	2	3	Strongly agree (4)	Avg.
1	7	1	3	2	2
2	0	3	6	3	3.11
3	0	0	7	7	3.5

Table 11.2: Total counts of answers to the question "Today's use of the application changed your view of at least one situation"

Participant	Strongly disagree (1)	2	3	Strongly agree (4)	Avg.
1	0	0	2	0	3
2	0	1	3	2	3.17
3	0	0	2	5	3.7

Table 11.3: Total counts of answers to the question "The app Emparent played a key role in today's conflict resolution"

Chapter 12

Conclusion

As part of this thesis, I used a user-centered design process to successfully research for, design, implement, and test a mobile application that helps parents apply Nonviolent Communication in their daily lives.

As part of research, I sat down with 11 parents with a child up to the age of 12 to gain an understanding into the problems they face in raising their children and how they approach them. From these interviews, I extracted the patterns that were typical for certain parents and then used personas to serve as a model for the distinct groups of parents with different approaches. I also researched Nonviolent Communication with a focus on how it relates to parenting, as well as related topics, such as emotion and need models.

Based on this research, I created vague scenarios to help me form a picture of how the project might fit into people's lives. I then held a brainstorming workshop, where I presented this research and scenarios to a group of 3 other people. Together, we brainstormed problems we saw that needed to be solved in the form of "How might we" questions, prioritized these problems, and based on these priorities came up with concepts using the design studio method. An effort-impact scale was used to evaluate each idea, and the winning idea was a mobile app guiding parents through the process.

With a general concept decided, I wrote up more specific scenarios and a hierarchical task analysis to help crystallize the ways people would interact with the app. Based on this, I drew various sketches using the Crazy Eights method, yielding a number of ideas to work from. After deciding on the best path forward, I created low-fidelity mockups in an online vector editor

called Figma and connected them into an interactive prototype using Figma's built-in prototyping tools. This prototype was tested with 3 parents and the solutions incorporated into the design.

After this round of testing, I created a landing page to gain more participants for further testing and asked friends to share it, gaining more than 20 potential participants not long after. At the same time, I began implementing the app itself, using a new framework called Flutter to make the app available for both iOS and Android. After implementation was done, the app was tested again with 2 methods: user testing, to find usability flaws, and diary studies, to see whether the app is helpful over time. The results of these studies will be used to further improve the application.

12.1 Discussion

The basic design of the app withstood both low-fidelity and high-fidelity testing, with only relatively minor changes required for improved usability. That suggests that the main flow promoted by the app fits people's mental models, and therefore that the concept creation phases were carried out successfully.

Not counting the participant that only recorded on a minority of days, each of the 3 participants that successfully completed the diary study has stated that the app has been at least partly responsible for helping them solve a conflict on at least two separate occasions during the two weeks they were using it. While the participants of the study tended toward parents with interest in improving their parenting skills (represented by the Michael persona), the results are nevertheless very promising. The app has succeeded in what it set out to do — help parents solve conflicts with their children in an empathetic way — and has the potential to succeed with other parents as well.

From the high-fidelity prototype tests that were done, it is clear that the app does not work as well for parents with less initiative and less ability to name their emotions and needs and identify those of others (represented by the Monica persona). These participants often remarked that they'd like to see concrete examples relevant to their specific problem. This suggests that, if the Monica persona is to be satisfied with the app, future development should focus on giving users a better idea of what the solution to their situation should look like.

12.2   **Future**

The plan is to keep working on this project as a piece of open-source software, inviting the community to contribute by providing translations, code, graphics, help with promotion, and more.

The license chosen for this project is a **dual license**, using a proprietary license as well as the GNU GPL v3 or later, one of the most popular copyleft licenses. The **GNU GPL** was chosen to ensure that any changes made to the project are contributed back, preventing others from using the app to build a proprietary competitor [gnu07]. A second **proprietary license** was needed only to ensure that the app can be placed in the iOS AppStore, as the terms for an app to be included are in direct violation of the GNU GPL [Smi10].

Appendices

Appendix A

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Appendix B

Workshop materials

B.1 Workshop worksheet

NVC worksheet

Goal

Teach parents how to resolve conflicts with their children while taking care of both their own and their children's needs.

Personas

Michael

- 5 y. o. Samantha
- married, living with partner
- Conflict resolution:
  - Acknowledges Sam's feelings
  - Asks what she needs
  - If Sam's suggestion is unacceptable, asks if there is another solution she could think of
  - If not, gives a few choices

- - If Sam won't choose, lets her be with her emotions
- Sometimes, emotions escalate; Mike tries to take a deep breath then or leave, but sometimes, he can't and yells at or slaps the child
  - Always apologizes afterward
- Inspiration:
  - Friends
  - Own childhood
  - Events he's attended (soft skill workshops and children's events)
  - Facebook groups
  - Was recommended parenting books, but only read a part of one

Monica

- 9 y. o. Tom and 4 y. o. Simon
- married, living with partner
- Conflict resolution:
  - Knows in her heart what the right solution is.
  - She tries to make her child see that it's the right one, explain why
  - If he rejects it, she tries to convince him through one of her techniques. This could be:
    - being playful
    - raising her voice
    - threatening with punishment

- - forcefully doing the action she set out to do (e.g. getting the child dressed or putting them to bed)
    - counting to 5
  - She doesn't like to use violence, uses it only when emotions get the best of her or when there seems to be no other option (like after counting to 5)
- Inpiration:
  - friends with children
  - parents
- Doesn't want to read books, finds them off-putting and often misguided
- Generally relies on intuition when parenting

NVC

Goal: Resolve conflicts so that the needs of all parties are met

How?
1. Understand your needs
2. Empathize with the other person's needs
3. Express your needs

Examples of needs

CONNECTION	PHYSICAL WELL-BEING	AUTONOMY
acceptance	air	choice
affection	food	freedom
appreciation	movement/exercise	independence
belonging	rest/sleep	space
cooperation	sexual expression	spontaneity
communication	safety	
closeness	shelter	**MEANING**
community	touch	awareness
companionship	water	celebration of life
compassion		challenge
consideration		clarity
consistency	**HONESTY**	competence
empathy	authenticity	consciousness
inclusion	integrity	contribution
intimacy	presence	creativity

love		discovery
mutuality	**PLAY**	efficacy
nurturing	joy	effectiveness
respect/self-respect	humor	growth
safety		hope
security	**PEACE**	learning
stability	beauty	mourning
support	communion	participation
to know and be known	ease	purpose
to see and be seen	equality	self-expression
to understand	harmony	stimulation
be understood	inspiration	to matter
trust	order	understanding
warmth		

Expressing needs

observation + feeling + needs + request →
When I see _____, I feel _____, because my need for _____ is/is not met. Would you be willing to _____?

Example situation

Your three-year old is balancing on the arm of a rocking chair.
Parent: "Sweetie, when you stand on the rocking chair, I feel afraid because I have a need for safety. You matter to me and I don't want you to get hurt. Would you be willing to balance outside or somewhere safer?"
Child: "But I want to play!"
Parent: "I hear that you have a need to play right now. What if I set up a balance beam outside for you? Would you like to use that?"
Child: "Yeah!"

Scenarios

The project will be referred to as "N" here.

Michael

1. Hears from a friend about a way to resolve tricky conflicts that he's having
2. Curious and eager, decides to give it a try during a bit of free time
3. N introduces the approach, gives a quick **rundown of the basics**
4. Mike is curious to learn more, asks N to **teach him each component in detail**
5. N teaches Mike **a bit of the theory**
6. Mike **confirms with N** that he understands the theory correctly
7. Mike has other things to attend to, tells N to leave the rest for later
8. Mike keeps the newfound knowledge in mind as he goes about his day, lets it influence his parenting
9. Mike often turns to N in his free time, asking for more training
10. On several occasions, Mike **asks N to help him with his specific problems**
11. Based on N's help, Mike tries to apply the newfound knowledge in real life, always **asking N what went wrong when the attempt fails**
12. Over time, Mike becomes more and more proficient in NVC, **turning to N for advice in how to apply NVC principles**

Monica

1. On several occasions, a friend of Monica's recommends N to her as a good way to resolve conflicts with children
2. Skeptical, Monica decides to look into N
3. Monica **asks N what it's for and what advantages it has compared to other approaches**
4. Still skeptical, Monica **wants N to prove to her that it can be effective.**
5. **N shows Monica how it can be more effective** than other approaches.
6. Curious whether and how NVC could work for her, Monica **asks N how she could apply it in real life**
7. N **walks Monica through a scenario relevant for her, making sure she knows how to avoid common pitfalls**
8. Monica decides to try the approach in a simple conflict with her son
9. Surprised by unexpected success, **Monica asks N to teach her how to apply NVC in other scenarios**
10. In Monica's bits of spare time, **N teaches her in bite-sized increments how to best deal with the situations she gets into**

Brainstorm

- Quantity over quality
- Crazy ideas
- Can be a complement to existing projects

- Can be several projects
- Sketches or notes
- **Very fast, only do high-level concepts**

Feedback

- Impression? Emotions?
- Does it solve the defined problems? Meet the goal?
- Does it meet the personas' needs?
- Is it understandable for them?
- Fears?
- SWOT: strengths, weaknesses, opportunities, threats

■ B.2 Write-up of HMW problems

How might we problems were written up and their priority was voted on:

How might we…

- Help parents achieve **clarity** when expressing and getting other people's needs? 4
- Help get people more **in touch with their needs? 4**
- help parents formulate their needs clearly? 3
- Create **trust** that the solution will help them to become better parents 3
- Help parents with their **emotional management/intuition**? 3
- help understand what is a core need? 2
- **condense** information 2
- Exploit the fact that people are **inspired by their friends**? 2
- Fit this into people's lives without being too **intrusive**? 2
- Keep parents **engaged 2**
- improve their "**emotional granularity**"? 2
- let them **practice** expressing needs? 1
- Break down complex needs into **atomic and achievable needs**? 1
- make sure parents **aren't discouraged** when first trying it? 1
- carry across what situations NVC is **not useful** for? 1
- **prevent** a parent feeling **discouraged** when things go wrong? 1
- **Offset reinforcing behaviours** from other kids/ movies/ TV etc? 1
- Make brief learning resources, workshops, and other media more **accessible** (including to different cultural backgrounds/languages/financial backgrounds)? 1
- Break the **stigma** of getting help with parenting? 1
- Help **children** figure out their **needs** (do they always know what they want/why)? 1
- Separate things that are **natural parts** of parenting/childhood from things that are "bad" and should be avoided? 1
- help understand what is a need and what isn't a need? 1
- show them the **effects in practice 1**
- Explain the method practically with real-life examples (not like in theory and stuff like that I don't have time for it!) 1
- help parents to learn parenting methods without creeping up on their personal **time**? (brevity) 1
- Figure out **why** children get so reluctant to do things like go outside?
- Advise people without being **patronising** (or consuming a lot of their time)?

- Avoid a feeling of **entitlement** – e.g. the other person needs to fulfil our needs? (Should parents be responsible for their own needs, rather than trying to push the child to fulfil those needs?)
- **teach** them the parenting methods
- improve the **children status** in the parent's view
- show them **proof** that nonviolent communication/this solution works
- create something that will **not seem impractical**
- **make** parents see the benefits of NVC?
- Gather "failure" stories and **success stories** too?
- share the design solution among **parent friends**
- Avoid discouraging parents when they make mistakes, making first steps accessible and **encouraging** and helping them be aware of their own mistakes, and to deal with **setbacks and failure**
- Improve **digital wellbeing** and use technology to help them somehow?
- Make sure that the way people meet their needs **doesn't infringe** on someone else's needs?
- Present **alternatives to N**?
- **Quantify** advantages and disadvantages?
- make sure the **first steps** aren't daunting?
- **prevent mistakes** when parents try it **in practice**?
- help parents **deal with consequences** if they don't do it right?
- help parents **see their mistakes** in applying in NVC?
- help a parent **go from theory to practice**?
- keep parents **engaged** over longer stretches of time?
- help parents **empathize**?

■ B.3 Design studio ideation

ASTS | AUDIO BOOK | TRANSCR

dolls, puppets etc

an AI robot living in your house

songs/music to build connections

workshops (roleplays)

based on art, psychodrama, conflict resolution

toys/board games designed to encourage roleplay

W?

app — need expressing app w/ pictures
— chat bot AI!

books (e-book, magazine)

MDMA (haha)

Series of videos — School of life style — "sitcom" with quiz (WSE style)

Coaching sessions or family therapy

blended learning course (workshops + readings + videos + quiz assignments)

VR with avatars (e.g. role reversal!!)

families team up with penpal families + advise then

family outing days to build relationships

sports (team building)

— help parents with emotional management? more in touch with needs?
— clarity for users?
— trust?
— keep in engaged?

(B)

N Can be

APP | MIND MAP | VR EXPERIENCE | BOOKS

SHORT VIDEOS | PODCASTS | AUDIO BOOK | TRANSCRIPTS

RADIO TALK SHOW | WORKSHOP | WEBSITE | SCHOOL

TRAINER | THERAPIST | TOY | ANIMATRONIX/ROBOT

TV SHOW / REALITY / TV

① Follow Algorithmic steps (Maybe)? STABEN

② Mindfulness Meditation / Bodily Connection

NVC could be a full time job / a way of life / spiritual belief

③

④ Get Representative Sample (Evidence)

- Open Source
  → Transparent
  → Inclusive
  → Secure
  → ownership / Responsibility to be distributed
      (Power)
      Control

⑤ Referral Programmes (Friend (optin))

⑥ Passive / Active Learning

⑧ Workshops

⑨ Live Demonstrable Evidence.

⑩ Multiple Access Methods (Different Media Groups)

→ Information Delivery & Retention

→ Regular Drills (Memory Style ... Practice) → Keep watering plants
    to keep them alive

→ Habit Formation (Gamification) → Habitica

→ Contribution (Community based) + Regular updates / Editions.

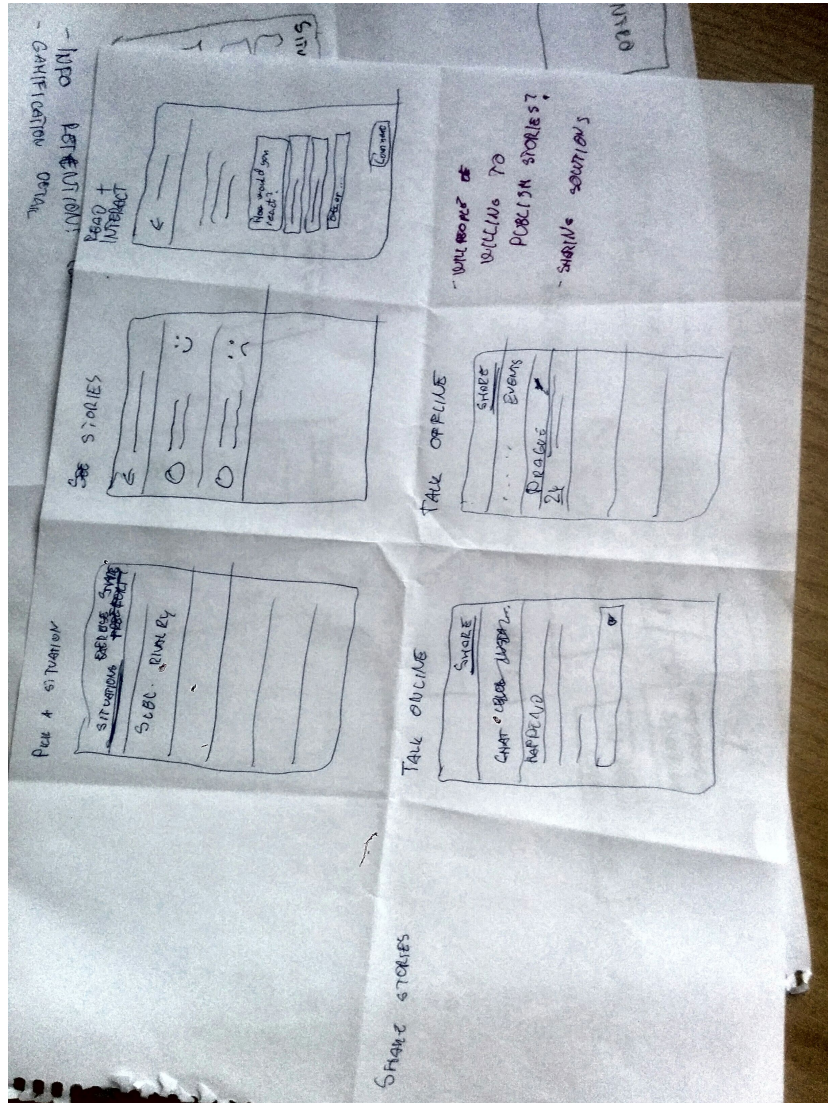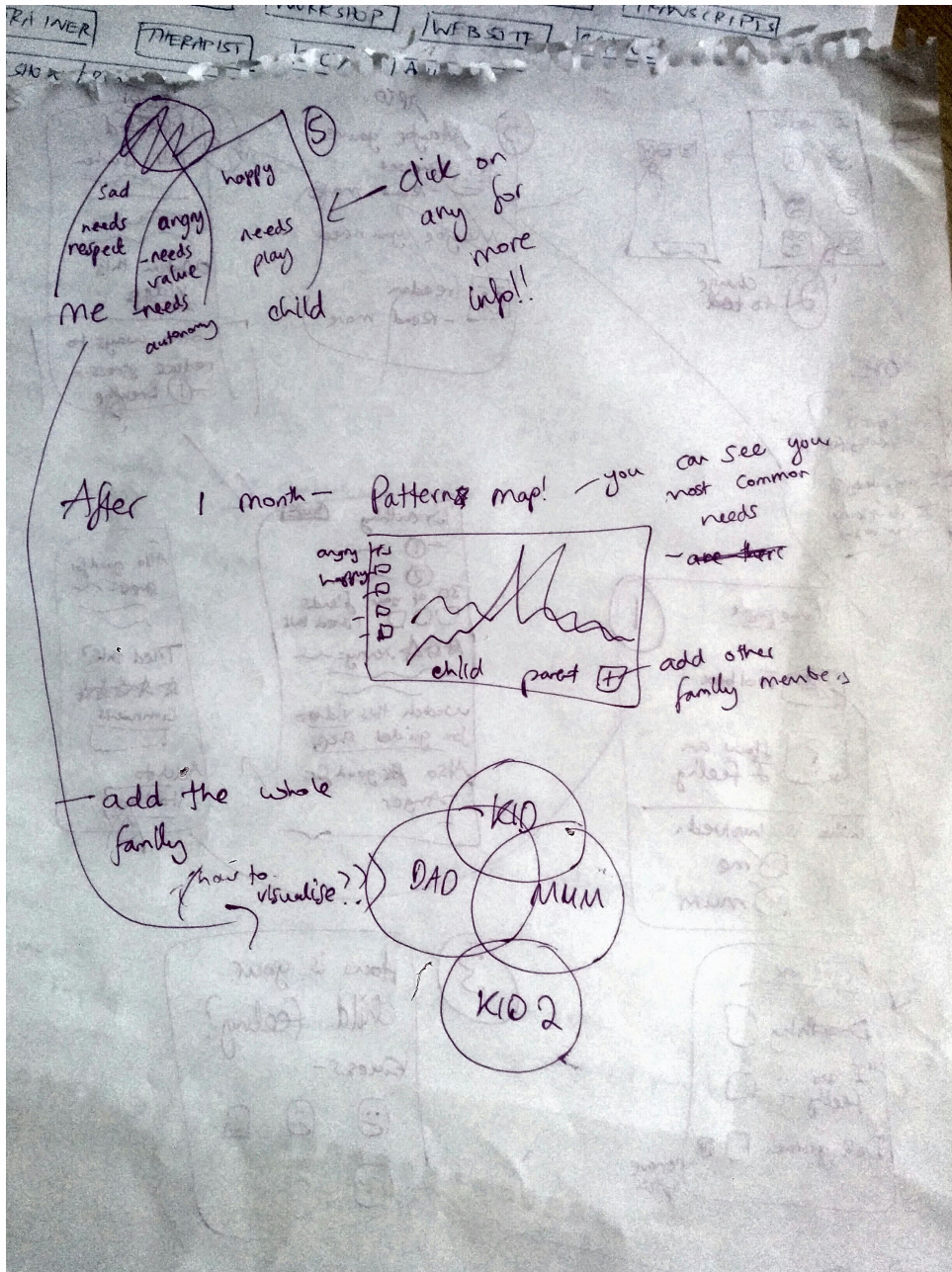→ Living Breathing "Repository" of Repeatable Experience of different people

95

— provide vocabulary for them — or encourage creation
of private language world!

— use imagery to help them express emotions

— Short, useful videos showing typical scenarios (with
scientific backing
+ success stories?)

— user forum/chat to share tips/advice/questions

— provide template sentences "when I ____"

— easy 'dictionary' of core needs (easy to understand)

— let them 'share' with friends somehow

— points system/gamification?

— provide 'failure stories' too — make clear nobody's perfect

— help create 'road map' for steps

— resource page

— have 'spokespeople' — approachable/famous (break stigma)

— Short, condensed,

— Headspace-style approach to own emotions

— quiz to suggest needs

Appendix C

Rejected concepts from the design workshop

Besides "The Celestial Parent Expert", there were three other concepts that came out of the design workshop I describe in the "Design workshop" chapter:

C.0.1 "Emotions in the Family"

This concept was designed to be used by the whole family, parents and children alike, with the central focus being the identification of one's own emotions and needs and ways to deal with them. In this concept, one could record their feelings and needs in a specific conflict, as well as drill down into each emotion and need and get information on ways to reduce unpleasant emotions or fulfill their needs. Each technique could be added to a personal toolbox, where one could find it again. In a later version, social features could be added, such as friends being able to comment on and rate these techniques.

One would be able to analyze the recorded emotions and needs through a Statistics screen, showing one patterns in time and intensity, as well as showing one how one's emotions and needs correlate with those of their children.

■ C.0.2   "Family Stories"

In this concept, stories about family conflicts would take center stage. The idea was to harness the power of stories and of social connections to allow parents to solve their problems effectively. The central element would be a story feed, similar to a social network feed, except one could choose to share their stories or keep them private. Each story would have a predefined structure, consisting of a description, emotions on both sides, needs on both sides, and the way it ended. People (including the original poster) would be able to add ideas for win-win solutions as well as comment on each of the sections of the story. (For example, there might be a need that the parent doesn't realize, but that's evident to a reader based on the description.)

■ C.0.3   "The Parenting Recommendation System"

The main idea behind this concept is teaching parents NVC methods through media they're already consuming. It would be a multi-platform recommendation system connecting to the services one is already using. Depending on the services one is subscribed to, it would recommend podcasts, videos, books, articles, posts, and more, all related to parenting practices consistent with the nonviolent communication method.

Appendix D

Other outputs

At the time of this writing, low-fidelity and high-fidelity mockups are available at this URL: `https://www.figma.com/file/JNTiWZkE4H2MoNLGTdzqyPao/Emparent`.

The code of the project is available at `https://gitlab.com/emparent/emparent`. The project's website can currently be found at `https://emparent.gitlab.io/`.
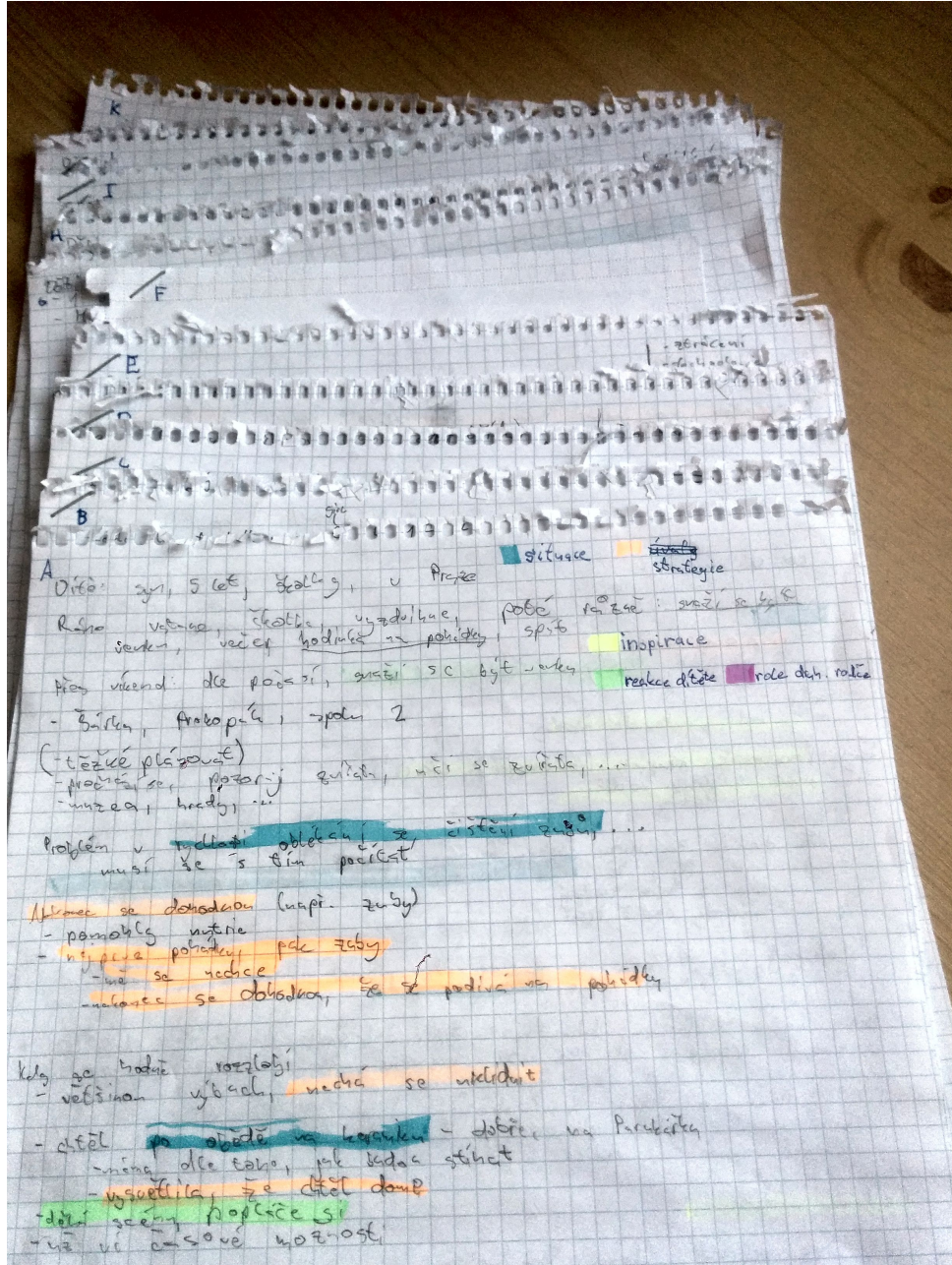
Figure D.1: Photo of research notes, carefully arranged and chosen to hide any clearly identifying information
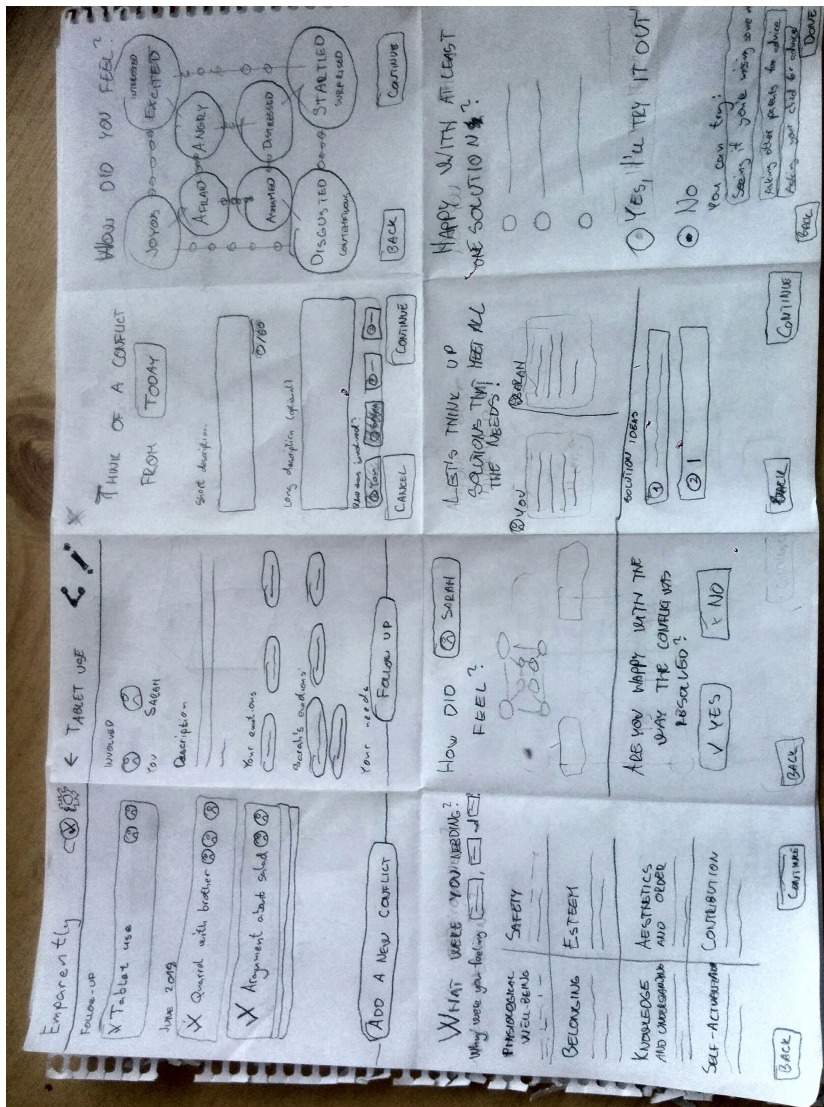
Figure D.2: App sketches
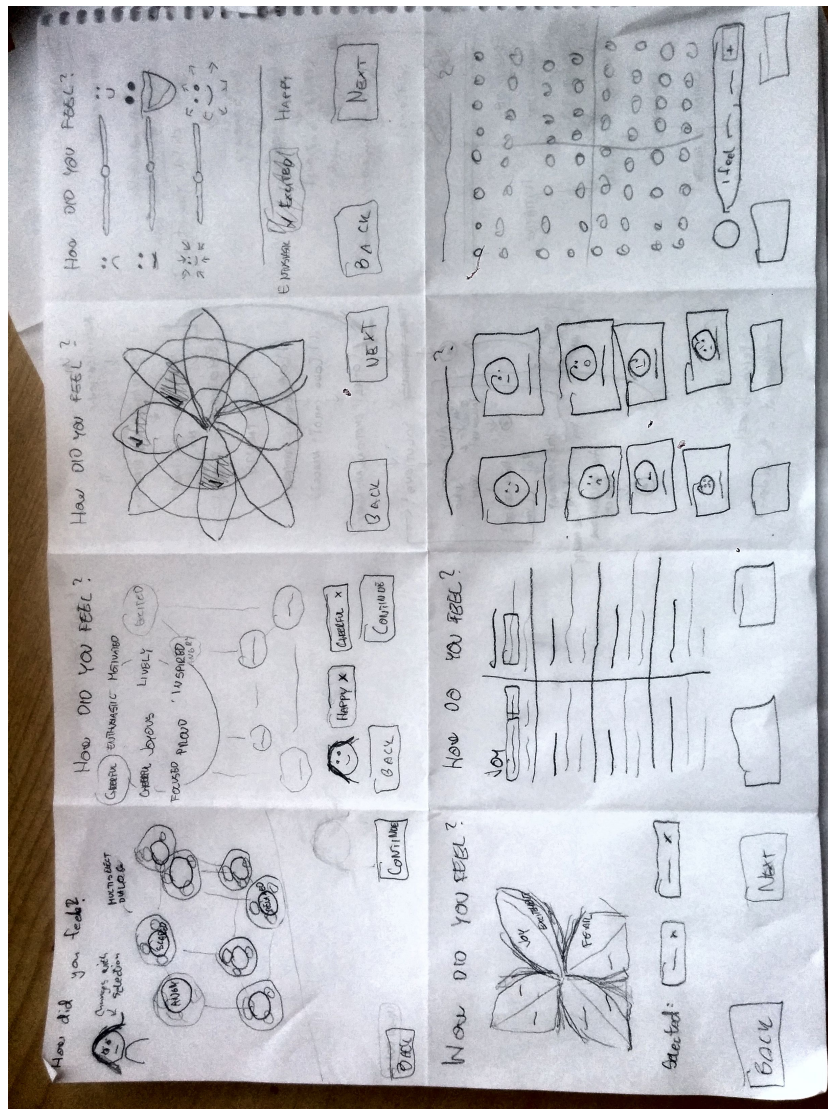
Figure D.3: Sketches of possible emotion pickers
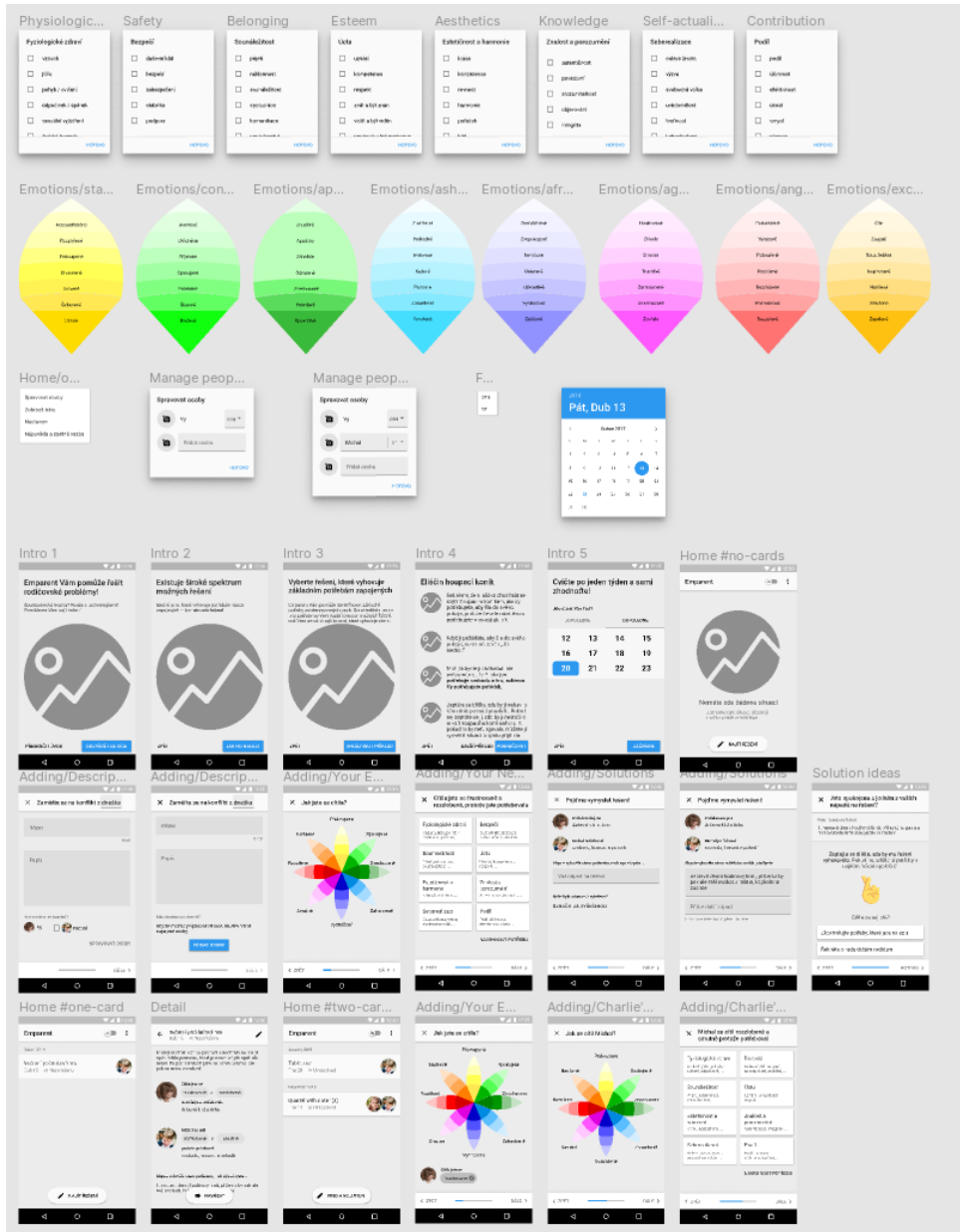
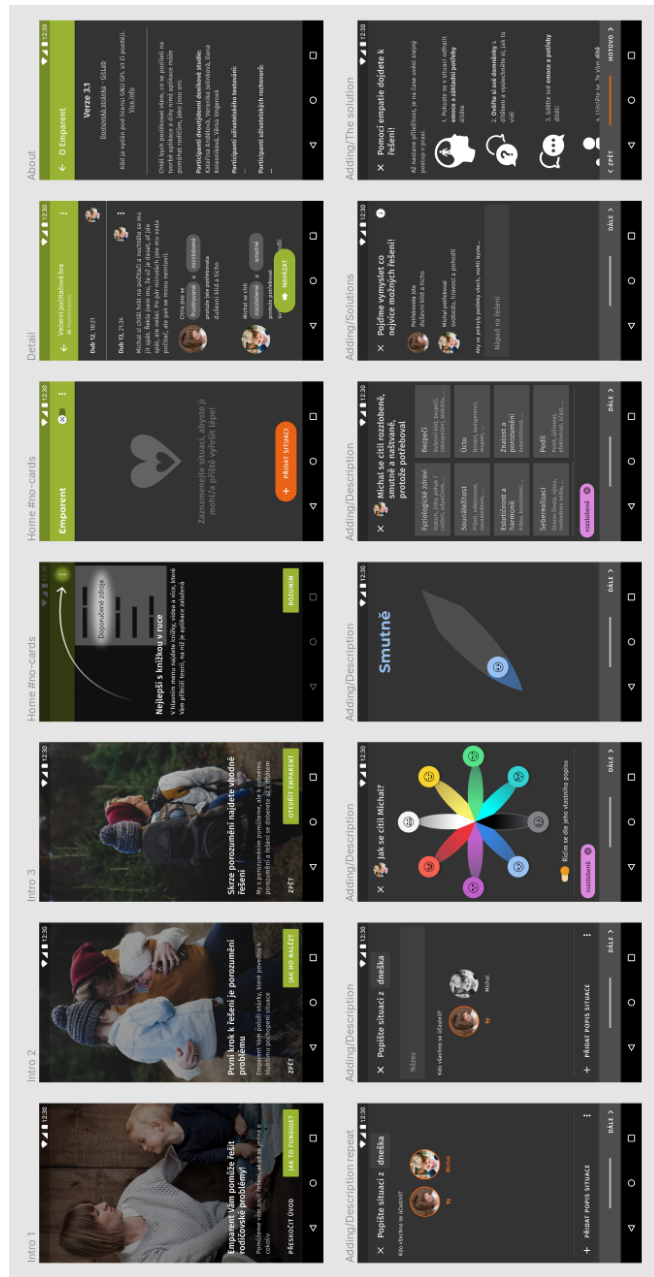**Figure D.4:** Low-fidelity mockups

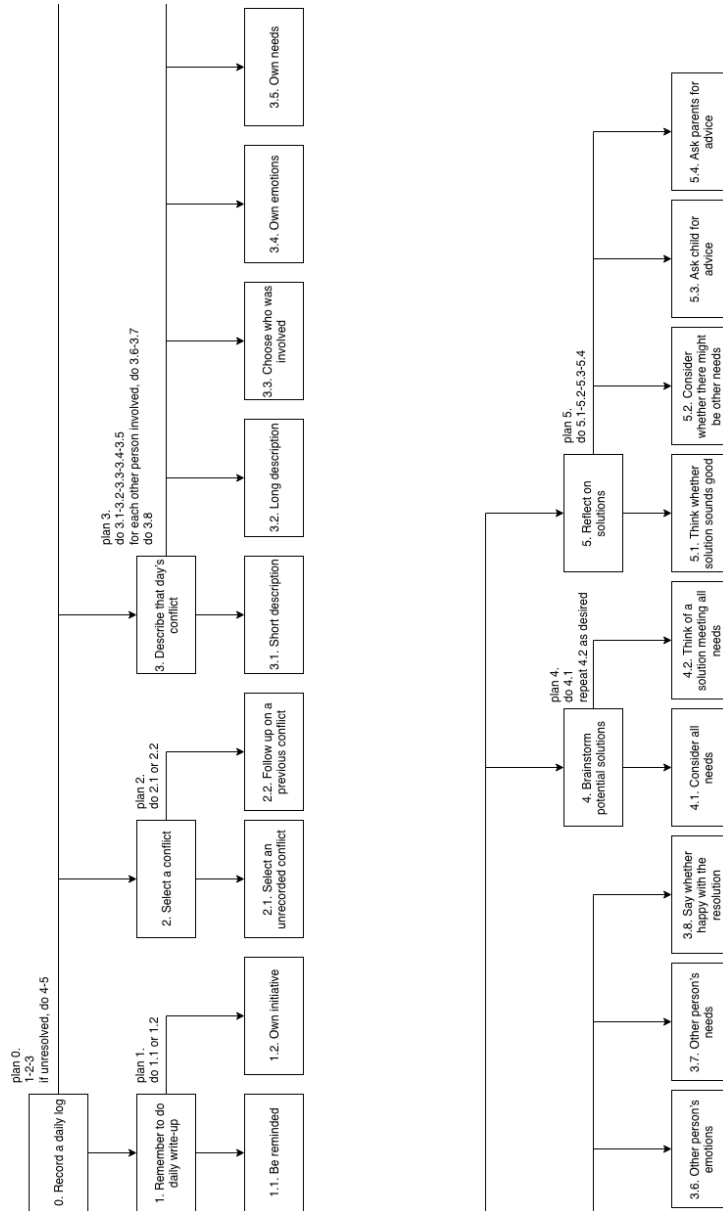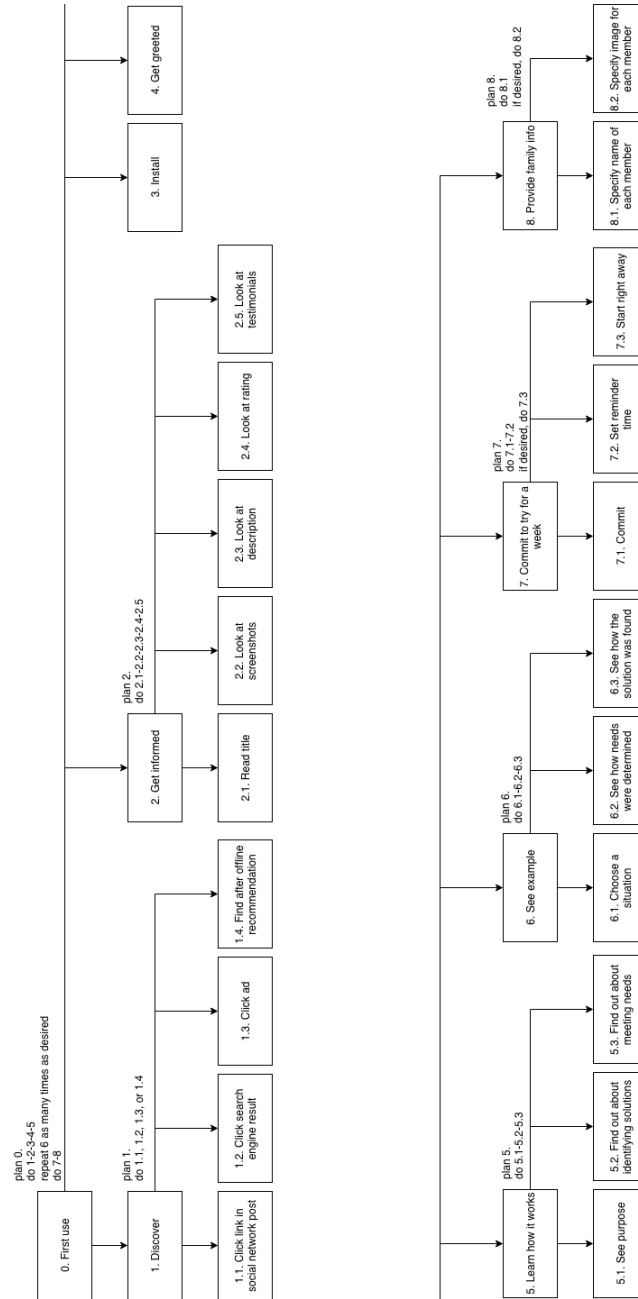**Figure D.5:** High-fidelity mockups

Figure D.6: HTA for logging a situation

Figure D.7: HTA for the app's first use