Increasing Empathy in Designers by Adding Context to Empathy Maps in the Design Process

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Abstract

Designing for user experience sometimes fails as certain contexts of use tend to be forgotten by designers. A way to minimise the chance of a frustrating user experience, is to create awareness of users and their contexts so that empathy for a user group is increased. In an empathic design process, designers can enhance empathy levels by using persona tools to step in and out of the user's world, such as the Empathy Map (EM) template. Previous research showed that the EM has its limitations, therefore a new prototype for the EM was created in a co-creation session and a follow-up focus group with designers. This resulted in adding new features and instructions to the template, which were: using images to visualise user situations, using Emojis to visualise emotions, naming the persona, adding a picture of the persona, and writing down the best- and worst-case scenarios when using the to be designed product. The modified and regular EM templates were tested in six workshops where participants had to fill them in based on insights from a transcript. Afterwards, they were asked about what they thought of the template and how they used in. Finally, they filled in a questionnaire that measures cognitive and affective empathy and their willingness to use the template of their condition. The main MANOVA tests found no significant scores for the empathy components and the willingness to use the EM. Limitations of this study had to do with the small sample and fictional transcript that participants worked with. Future research should look into further improving the EM template and testing it with a real transcript on an actual design task with a larger sample in both conditions.

Keywords: User Experience, Context, Empathy, Cognitive, Affective, Empathy Map.

Increasing Empathy in Designers by Adding Context to Empathy Maps in the Design Process

Imagine rushing to your sick child at the children's hospital at night because you received a message that something was wrong. As the elevator arrives on the correct floor, the doors open and you hear a recording of children cheering. In the book "Design for real life" by Meyer and Wachter-Boettcher (2016) it is explained that the designer of these joyful elevator sounds tested the idea and many thought of the addition as delightful. However, they did not consider different contexts in which the elevator would be used, such as the stressful atmosphere at night in an emergency situation.

This is one of many examples where design has failed, even if its intentions were right. The different contexts of use were not considered because designers tend to think solely of the bigger group and not of so-called *edge cases*, which can be defined as consequences of mainly subconscious design decisions that have a negative impact on a minor number of users (Meyer & Wachter-Boettcher, 2016). Consequently, these edge cases can leave users in distress with a frustrating *user experience* (UX). Humans live their lives via experiences. which is how values and feelings of worth are formed. Therefore, designing for user experience is not just about creating interactive systems and pushing them into the world, it is also recognising how they affect the user (Benyon, 2014).
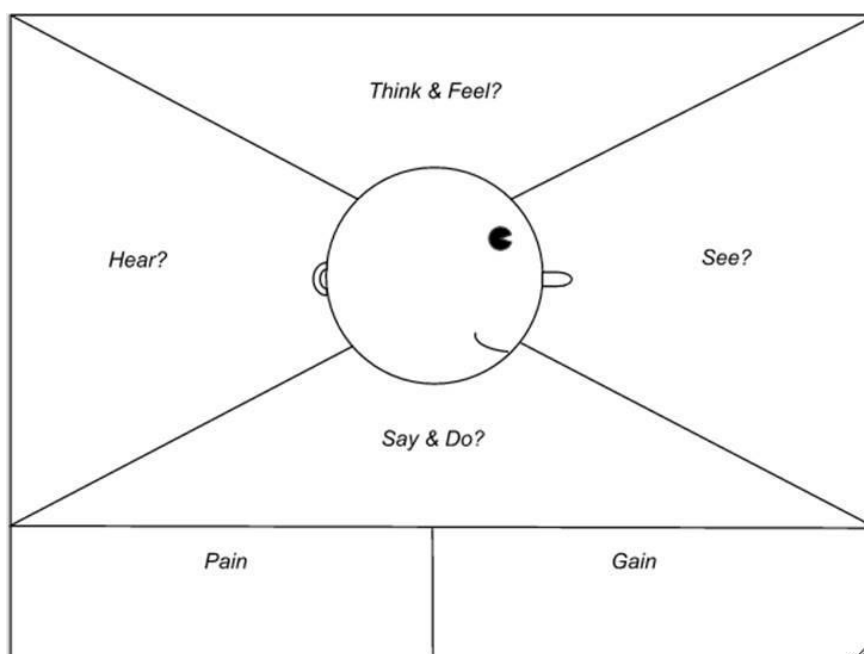
Hassenzahl (2018) states that UX has become a key concept since the Human-Computer Interaction (HCI) community has agreed that usability and functionality do not suffice for establishing a holistic experience. Additionally, he describes how "UX encompasses all aspects of interacting with a product", going beyond usability and functionality to include other aspects such as its situatedness and temporality. Every experience is different depending on the product, the users' mood states and the timespan of usage (Hassenzahl & Tractinsky, 2006). To account for these aspects, specifically users' stressed mood states, designers strive to gain a better understanding of their users' experiences and lives through *empathic design* (Kouprie & Sleeswijk Visser, 2009).

Although empathic design tries to map individual experiences and users, conscious or subconscious choices are still made based on the tools and methods that are available. One of these tools is a *persona*, which can be described as a fictional, typical user of a system or service that represents the population (Lupton, 2017). Standard formats and templates are the reason that most personas look the same. They mostly summarise demographics, user needs, and other relevant information that is used to "put a human face on product design" (Hass, 2019). However, humans are more complex than that and current tools seem to be missing context, such as the stressful children's hospital elevator situation mentioned earlier.

One tool that aims to add context to personas in the design process is the Empathy Map (EM). This is a visual tool for designing from the user's point of view with the intention of creating more empathy for the user (Ferreira et al., 2015). A typical empathy map consists of six fields: See - the user's perceived environment; Say and Do - the user's attitude in public, Think and Feel - the user's mind; Hear - the influence of others; Pain - the user's irritations and uncertainties, and Gain - the user's goals and wishes. An example can be seen in Figure 1.

Figure 1

Empathy Map Template

The EM shows improvements from regular personas by its attempt to uncover underlying thoughts and emotions, but there are still disadvantages. The research by Ferreira et al. (2015) showed that participants experienced the EM to be limited as they indicated that they were constrained to the given information and findings of the population, which influences the thoroughness of the persona. However, even if more contextual information would have been given in the scenario, "the lack of a context field" was also mentioned by the participants, from which we can conclude that the EM does not seem to be able to create the full picture of a persona and the contexts in which this persona could potentially use the product. In conclusion, the tool is still lacking in multiple aspects that are to be explored.

Regardless of its limitations, the same research by Ferreira et al. discovered that the tool is easy to use and perceived as helpful for designing personas. Consequently, it poses as an adequate starting point for more empathic design once its limitations can be overcome, which is needed to fully understand the user and prevent edge cases from being left out. Additionally, improving tools such as the EM to raise empathy levels in designers is important as increased empathy triggers a genuine emotional response that helps them understand that users in stressful situations need their help (Meyer & Wachter-Boettcher, 2016). The emotional response towards users' personal experiences can be seen as an affective component, while understanding this response and the experiences of the users are part of the cognitive component (Kouprie & Sleeswijk Visser, 2009). Both components are needed for designers to step in and out of the world of the user, which allows them to create accurate designs that could result in minimising stress cases. Therefore, this research aims to answer the following question:

How can we add context to empathy maps, and does this increase designers' affective and cognitive empathy towards their target users?

To answer the stated research question, a modified EM prototype will be developed in collaboration with designers, and its influence on empathy will then be tested using experimental design workshops.

Theoretical framework

Empathy

Empathy is a psychological concept that consists of multiple components. The word itself comes from Greek, where *em* means *into* and *pathos* means *feeling*. It is used to describe how we can feel as if we are someone else and understand them and therefore it differs from sympathy, which is merely a way of relating to someone else and not essentially knowing how they feel (Wispé, 1986). Still, authors maintain different definitions for empathy and sympathy that are closely linked to each other. Escalas and Stern (2003) create a distinction by defining sympathy as a primarily cognitive process while empathy is described as a primarily affective process. However, Kouprie and Sleeswijk Visser (2009) state that these affective and cognitive components should not be viewed separately, but rather as "the core mechanism of empathy". In addition, both components are used in our brain in the decision-making process. Therefore, this research will focus on both cognitive and affective components of empathy.

The affective component of empathy is described as "an automatic response to another's emotional state" (Kouprie & Sleeswijk Visser, 2009). It is focused on feeling and identifying with another. In the research by Escalas and Stern (2003) this response is briefly defined as someone's absorption in the emotions of someone else. Your feelings are mixed with the feelings of another, rather than just being aware of how someone feels. For example, if you see someone consuming something extremely sour, an affective response would be that your own mouth would start to water. In some way, you are "becoming" the other through an affective process of perspective taking, and thus barriers between the observer and a person vanish (Lipps, 1903, as cited in Kouprie & Sleeswijk Visser, 2009).

Researchers have argued that there is another way to take someone's perspective where it is not about "becoming" but about "staying aside", which is feeling like one another but with barriers still remaining (Stein, 1917, as cited in Kouprie & Sleeswijk Visser, 2009). This view encompasses the cognitive component of empathy, which is described by Baron-Cohen and Wheelwright (2004) as "the understanding by the observer of the other person's

feelings". The observer takes knowledge of the circumstances of someone else and envisions those circumstances from their own perspective. This cognitive process of perspective taking aids the understanding of how another person experiences certain events.
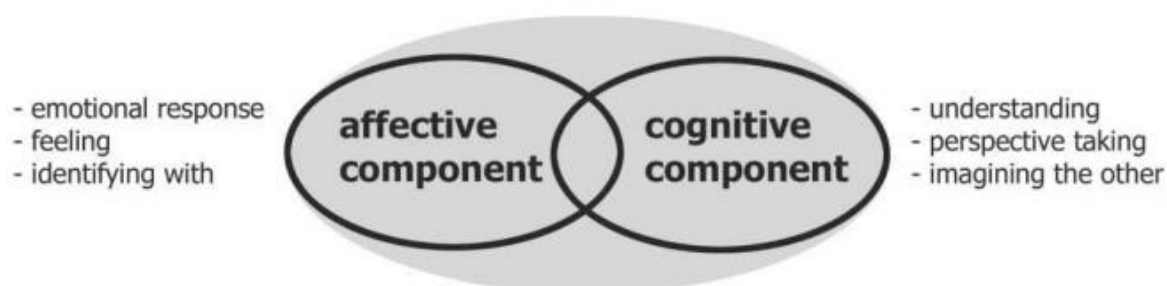
According to Kouprie and Sleeswijk Visser (2009), both manners of perspective taking are relevant in design as different user research methods show different perspectives of the user. For example, observation allows the designer to stay beside the user while roleplaying allows the designer to step into the user's shoes. This also highlights the importance of viewing both cognitive and affective components as an intertwined mechanism, which can also be seen in Figure 2. Especially in the design field, this mechanism allows designers to have an emotional response to the user's mood states and critically think about it through perspective taking. Therefore, the design process and tools that aid the process should take both empathy components into account.

Empathy in the design process

At the end of the 90s, the term "design empathy" was first used to describe that not only the feelings of the user should be considered, but also the feelings of the designer (Battarbee & Koskinen, 2005). Gaining empathy for the user group is critical since it increases the willingness to truly help someone else and understand their frustrations (Reynolds & Scott, 1999). Therefore, the UX design process starts by gaining empathic comprehension of the user's favoured experiences rather than starting product development immediately. Products that come from a solely rational development process lack the

Figure 2

The Affective and Cognitive Components of Empathy

emotional connection that is needed for a user to link with a product or brand and to keep using it (Dandavate et al., 1996).

Accordingly, it can be stated that empathy is a quality of a design process where designers let go of their own views and expertise to immerse themselves in the lives of their users (Battarbee, 2004). This is dependent on the designer's ability and willingness to adopt this view. For example, after a long day of hard work a designer might be less motivated to do so. On the contrary, a designer might be more motivated when they have a personal connection with their user group. This connection can be formed through empathy, which according to Battarbee (2004) helps to "make the leap from knowing to understanding" and is needed to observe contexts of users from which designers can learn about particular user experiences. Thus, the designer's context as well as the contexts of the user have a great influence on the designer's empathy level and process.

The process of implementing empathy in design may vary per designer, but Kouprie and Sleeswijk Visser (2009), propose a process of four phases. It starts with discovery; this is when the designer gets to know their user and their experiences. Second, there is immersion, in which the designer is "pulled into the user's world" and tries to get familiar with them. Next comes connection, which is when the designer evokes their own emotions (affective component) and creates an understanding (cognitive component) through similar experiences. Finally, there is the detachment phase, where the designer steps out of the world of the user with increased knowledge to evaluate. After the last step, the designer can start with creating concepts for their user group.

During this conceptual phase, designers can use various tools to stay close to their user group when generating ideas. These tools serve as an inspiration for the designer and are typically a combination of qualitative, textual and visual information. They aid in envisioning what the experiences, needs, and wishes of the user group are like (Dandavate et al., 1996). The regular persona mentioned in the introduction is an example of a tool that designers use to gain inspiration and summarise insights from a user group. During idea generation, a designer should keep their persona(s) in mind to make sure they fulfil all of

their potential users' needs. However, as stated before, regular personas seem to miss depth and context that could minimise edge cases.

Empathy Map (EM)

The EM template could be viewed as a more in-depth persona. Initially, it was created for fitting new business models to the needs of consumers but soon it was also adopted in other fields, such as design (Gray et al., 2010). The goal of the EM is to increase the empathy of a designer so that they can step into the world of their user, as previously described in the phases of implementing empathy in the design process. Consequently, the designer is presented with insights that are accurate and aid in portraying the experiences of the user (da Silva Melo et al., 2020).

As described in the introduction, the EM consists of six fields. These fields allow the designer to think about what the user's environment, emotions, goals, and frustrations are like so that they can immerse themselves into the life of their target user. Visualising the user's perspective is beneficial for developing the empathy component (Peixoto & Moura, 2020). The more detailed these insights, the better a designer can picture their user's world. Therefore, it is of great importance that context is not forgotten.

According to Maguire (2001), thinking about contexts of use is beneficial to understand the situation in which a product will be used and it aids in identifying problems with the usability of a product. He defines context of use as "the users, tasks and equipment (hardware, software and materials), and the physical and social environments in which a product is used". In addition, in technology design the consequences of this construct are often forgotten as described in the elevator anecdote from the introduction. Awareness of context of use is necessary for the designer to create a suitable design for the real world and will therefore naturally improve a design. However, empathic design approaches and methods do not seem to be optimised for the inclusion of contextual factors.

Previous empirical research highlighted the "the lack of a context field" in the EM template (Ferreira et al., 2015). Context is needed to understand the experiences of the user and to create a fitting design. Furthermore, a more detailed picture of the user's perspective

can increase empathy (cognitive and affective) in designers, which is a quality of the design process. In turn, increased empathy evokes emotions of the designer and creates better understanding of the user which could prevent edge cases. Therefore, the following is hypothesised:

H1: Adding context to empathy maps will increase cognitive and affective empathy of designers towards their target user.

Method

This research consisted of two phases: the development of the EM prototype and experimental design workshops to study the prototype's effect on empathy. This was inspired by the method of creating the Data Ethics Decision Aid (DEDA), a template that aids scientists with making ethical decisions regarding data (Franzke et al., 2021). The DEDA was created from experts' insights and subsequently tested in workshops. Since this research focuses on improving an existing template, a similar approach with multiple phases was used. The phases of this study will be discussed separately to clearly describe the corresponding methods.

Phase I: Developing the EM prototype

Design

To come up with an addition to or change in the EM template, a co-creation session followed by a focus group were conducted. The co-creation session's goal was to include users in a design process, in this case including professional designers in creating an addition to the regular EM template. During the session, participants engaged in multiple exercises that sparked debate, encouraged creative idea generation, and created empathy between them and the researcher (Lupton, 2017).

After this co-creation session was conducted, the researcher gathered the findings to propose a new concept as a modification of the EM. The aim of the following focus group was to let the same participants from the co-creation session evaluate the prototype and critically reflect on whether it fulfilled their needs from the first session.

Participants

Both the co-creation session and the focus group consisted of the same persons gathered through purposive sampling. The only requirement was that they had experience with working in a field of design. There were four female participants from which two work as UX-designers and the other two as UX/UI (user interface) designers. The mean age of the group was 24.75 (*SD* = 1.26) and they all have acquired a bachelor of applied sciences degree in Communication and Multimedia Design.

Materials and procedure

Setup of the co-creation session. Before the co-creation session, participants were asked to prepare an exercise at home. They were provided with information based on findings from the Survey of Health, Ageing and Retirement in Europe (SHARE; Börsch-Supan, 2022) and an empty EM template. The raw dataset contained questions and possible answers from the survey and was used as an inspiration source for a fictional transcript. Therefore, no real data was exposed to the participants as the researcher randomly combined the questions of the SHARE with some of the answer possibilities. The fictional case focused on lonely elderly people that were looking for a digital solution to connect more to others, thus the questions from the SHARE that were chosen were based on subjects as current living situation, connection with family, health issues, and internet usage. With the given information, the participants had to fill in the template and send it to the researcher. The homework exercise can be found in Appendix A (in Dutch).

The co-creation session was held in a physical room around a large table. The participants were welcomed with something to eat and drink and asked to introduce themselves to each other. Consequently, participants were asked to fill in an informed consent form and asked for permission to record the meeting. The homework exercise was shortly discussed and questions regarding the use of the EM template were asked. Afterwards, the researcher shared their knowledge about the EM and its limitations.

The described introduction was followed by two creative exercises. The first exercise was a divergent thinking task where the goal was to generate as many ideas as possible

(Sawyer, 2011a) that propose a solution to the given problem: How can we increase the empathy of designers towards their target users by adding context to the EM? The ideas were written out individually on post-its before they were discussed with the entire group and categorised, since research has shown that brainstorming in such nominal groups is more effective than traditional brainstorming (Sawyer, 2011b).

The second exercise was a convergent thinking task, where the goal was to categorise the ideas and choose one best possible solution (Sawyer, 2011a). This was done using the Centre for the Development of Creative Thinking (COCD) box method that separates the original, feasible, and common ideas (Baillie, 2006). The setup plan of the co-creation can be found in Appendix B (in Dutch).

Setup of the focus group. The researcher developed a first version of the modified EM as a result of the co-creation session and discussed it in an online focus group with the same participants from the first session. The participants were asked for permission to record the meeting. Consequently, the researcher presented the newly proposed tool that was based on their concepts. Additionally, the participants could critically reflect on the execution of the prototype and if it incorporated their needs as designers. The researcher used this feedback to further optimise the prototype for phase II of this study.

Analysis

The audio of the sessions was recorded with permission of the participants. The fragments where participants had to present and explain their choices were transcribed and coded using in vivo coding. With this coding technique, words and phrases from the transcript that were seen as relevant were highlighted and used to code other segments of the transcript (Baarda et al., 2013). The segments of the co-creation can be found in Appendix C and the segments of the focus group can be found in Appendix D.

Phase II: Experimental design workshops

Design

To evaluate the effect of the proposed prototype on the empathy of designers and future designers, six workshops took place. The aim of these workshops was to have (future)

designers work with the (new) EM prototype so they could evaluate it and provide feedback. The independent variable was the EM map template. Three out of the six groups were presented with the regular EM template, while the other three groups were asked to work with the modified EM template. At the end of the workshops, the participants' cognitive and affective empathy, as well as their willingness to use the EM, were measured through an online questionnaire made in Qualtrics.

Participants

The participants were gathered through the Human Subject Pool of Tilburg University and through the network of the researcher. The requirement was that they needed to have some affiliation with design through courses, work, or hobby. In total, there were six workshops consisting of three participants each. There were four male and five female participants in the regular EM condition, the mean age of the group was 24.22 (SD = 2.86). In the modified EM condition, there were two male and seven female participants, the mean age of the group was 24.67 (SD = 2.06). Almost all participants had obtained a bachelor's degree, one of them had a master's degree and one completed secondary school education.

Materials and procedure

The workshops were held at Tilburg University in the Media Design Lab's Creative Space. The participants were welcomed and asked to fill in an informed consent form. Additionally, parts of the sessions were recorded after participants had agreed to the terms of recording. The researcher gave a brief introduction of the problem statement and explained the origins of the EM. In groups, participants were asked to fill in the given EM template with the same information from the SHARE dataset that participants from the co-creation session utilised. The participants of the regular EM condition received the corresponding template and pens, while participants of the modified EM condition also received magazines, post-its, an Emoji sheet, scissors, and glue sticks based on the final prototype from the co-creation which will be explained in the results section. After filling in one of the templates, participants were asked to present their EM and the choices they made to the researcher.

To measure cognitive and affective empathy, the Ad Response Sympathy (ARS) and Ad Response Empathy (ARE) scales were used (Escalas & Stern, 2003). In the research by Escalas and Stern (2003), empathy is defined as the affective component while sympathy entails the cognitive component. The seven-point ARS scale consisted of five items that measured cognitive empathy (e.g., "Based on what was happening in the transcript, I understood what the interviewees were feeling") and had a minimally acceptable reliability, α = .65. The seven-point ARE scale consisted of five items that measured affective empathy (e.g., "While filling in the empathy map, I experienced feeling as if the events were really happening to me") and had had an excellent reliability, α = .92. The full scales can be found in Appendix E.

To statistically explore whether the participants would be willing to use the EM from their workshop, this construct was measured using three items of the Persona Perception Scale (Salminen et al., 2020) on a five-point scale (e.g., "This persona would improve my ability to make decisions about the customers it describes") and had a strong reliability, α = .83. The items from this scale can be found in Appendix F.

The participants completed the items of these scales at the end of the workshop alongside demographic questions.

Analysis

The audio of the workshops was recorded with permission of the participants. The fragments where participants had to present their filled in EM template and explain their choices were transcribed and coded using in vivo coding. The segments of the workshops can be found in Appendix G.

Secondly, to test whether there was a significant difference between the two EM template conditions (regular vs. modified) and their effect on cognitive and affective measured with the ARS and ARE scales, a MANOVA was performed.

Lastly, to statistically explore whether the participants would be willing to use the EM from their workshop, an ANOVA was performed. The data of the workshops was explored and tested in IBM Statistics 27.

Results

In this section, the results of both phase I and II of the research will be discussed separately. Phase I consisted of a co-creation session with a follow-up focus group. Phase II consisted of six workshops and a questionnaire that was filled in by the participants in the workshops.

Phase I: Developing the EM prototype

Results of the co-creation

At the start of the co-creation session, the participants' thoughts about the original EM as a result of the homework exercise were discussed. Overall, participants preferred the EM over a regular persona.

> *"I think it is better than a regular persona. A persona is a summary of your interviews that is focused on best case scenarios, but that is not that realistic." – Participant 1*

They specifically liked the 'Think and Feel', 'Say and Do', and 'See' fields, as they made them think about what this person experiences and how they behave.

What they did not like about the EM, is that some insights seemed to fit into multiple categories. Consequently, one participant failed to put some insights into any of the categories and placed them above the template instead. What stood out as well was that all participants put entire sentences of the transcript in each field instead of short insights, which made the filled in templates lose their ability to provide an overview.

> *"I put in entire sentences of the transcript because I was afraid that I would be making assumptions if I did not." – Participant 4*

After discussing the homework exercise, numerous ideas were generated regarding the inclusion of context in EM templates and these were organised based on their originality

and feasibility. After the first exercise where participants had to generate as many ideas as possible, multiple categories of ideas were formed, which were:

- More specific input from interviews (e.g., asking for more input about 'why' an interviewee answered something)
- Combine with PACT (People, Activities, Contexts, Technologies; Benyon, 2014)
- More visual EM
- Scenarios/consequences
- Include the feelings of the designer
- Highlight differences between interviewees
- Multiple EM templates per use case
- More categories in the template
- Involve target audience in filling in the EM
- Video

'More visual EM' was the biggest category with the most ideas, secondly the use of 'scenarios/consequences', and lastly in a shared third place were categories 'more specific interview input' and 'involve target audience'. The categories can be seen in Figure 3.

Figure 3

Categorised Ideas on Post-its as a Result of the Idea Generation Exercise.

In the second exercise, these categories and ideas were organised using the COCD-box followed by a final recommendation from the participants. The recommendation included a combination of most of the original, feasible ideas and some normal, feasible ideas. From the original ideas they advised using more visuals when filling in the template such as pictures and Emojis.

> *"[…] And then also create a legend with Emojis that you can use to visualise emotions and their meaning." – Participant 4*

Additionally, they recommended adding a field where designers can make up best- and worst-case scenarios when the persona from the EM is using the product they will be designing to brainstorm about possible consequences of use. Lastly, from the normal ideas they recommended adding a name and picture to the EM to make the persona feel more like a human. The final COCD-box can be seen in Figure 4.

Figure 4

The Ideas and Categories from the First Exercise Organised by Originality and Feasibility.

The ideas recommended by the designers have been implemented in a first version of the modified EM template, which can be seen in Figure 5. At the top, instructions were added together with the Emojis that the designer can use and their meaning. In the middle there is a placeholder for a persona picture and a name. In the bottom part, fields for best- and worst-case scenarios were added.

Figure 5.

Modified EM Template Version 1 as a Result of the Co-creation Session

Results of the focus group

The first version of the EM was presented to the participants in an online focus group. Overall, participants agreed that their ideas were implemented in the design. However, they suggested some improvements. The instructions should have structured formatting by using bullet points so that it is immediately clear what information can be added in the EM. Additionally, the emotion range of the Emojis seemed to have a gap between the positive and negative emotions. Thus, adding a 'satisfied' and 'neutral' Emoji was encouraged. They also suggested to remove the 'loves it' Emoji as it does not represent an emotion.

> *"[…] 'Loves it' and 'happy' are on the same level, but 'happy' is an emotion." –*
> *Participant 4*

Lastly, they recommended adding a question that could help the input for the best- and worst-case scenario fields.

One participant admitted that they would have liked to see a more visually attractive EM, but also understood that there should be limits to where the modified EM deviates from the original template. The other participants agreed with this statement.

> *"I personally would like to see more attractive styling. What I had in mind would*
> *deviate from what the empathy map is, but I understand that the template should be*
> *recognisable." – Participant 1*

The feedback has been implemented in the EM template, which can be seen in Figure 6. This template will be used in the workshops from phase II.

Figure 6.

Modified EM Template Version 2 as a Result of the Follow-up Focus Group

Phase II: Experimental design workshops

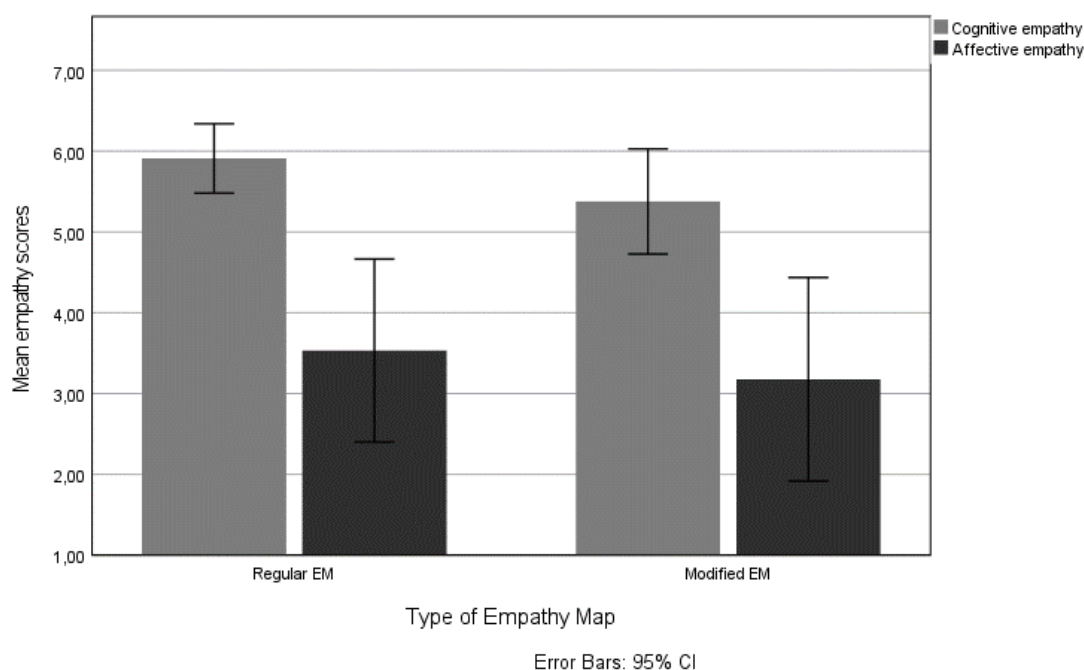On average, participants in the regular EM condition had a mean cognitive empathy score of 5.91 (*SD* = 0.56). For the modified EM condition, the mean cognitive empathy score was 5.38 (*SD* = 0.85). Participants in the regular EM condition had a mean affective empathy score of 3.53 (*SD* = 1.47). For the modified EM condition, the mean affective empathy score was 3.18 (*SD* = 1.64). These differences in means per condition can also be seen in Figure 7, where the regular EM scored higher on both empathy components than the modified EM.

To statistically explore the hypothesis whether adding more context to empathy maps increases cognitive and affective empathy of designers towards their target users, a MANOVA was performed with EM type (regular vs. modified) as the independent variable, mean cognitive empathy score and mean affective empathy score as the dependent variables. All assumptions for normality and Box's Test of Equality of Covariance Matrices were met, but this did not apply for homogeneity assumptions. The full assumptions check can be found in

Figure 7

Bar Chart with Error Bars of Mean Empathy Scores (Cognitive and Affective) Regarding Type of Empathy Map
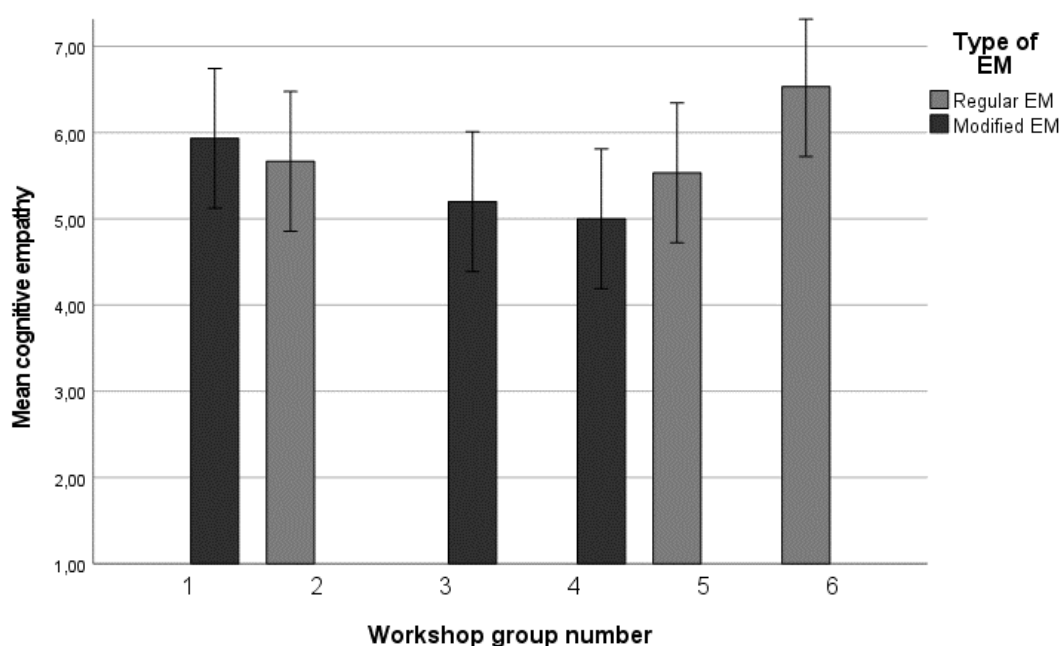
Appendix H. The MANOVA is fairly robust against the violation of homogeneity assumptions, so no bootstrapping will be performed.

The overall MANOVA was not significant, indicating that there is no effect of EM type on cognitive empathy $F(1, 18) = 2.496$, $p = .134$, partial $\eta^2 = .14$, or affective empathy $F(1, 18) = 0.234$, $p = .635$, partial $\eta^2 = .01$. This can also be concluded from the insignificant Wilks' Lambda (Wilk's $\Lambda = .85$, $F(2, 15) = 1.305$, p = .30, partial $\eta^2 = .15$). Thus, the hypothesis *'adding more context to empathy maps increases cognitive and affective empathy of designers towards their target users'* can be rejected.

To further explore group-level differences, bar charts with error bars were plotted for cognitive empathy and affective empathy. The mean cognitive empathy scores per workshop group number and type of EM can be seen in Figure 8. Overall, there are differences in groups for cognitive empathy as we can observe that group 1 scored higher than group 3 and 4 in the modified EM condition. This difference is not as great as the difference between group 6 and the other groups in the regular EM condition.

Figure 8

Bar Chart with Error Bars of Mean Cognitive Empathy Scores per Workshop Group Number and Type of EM
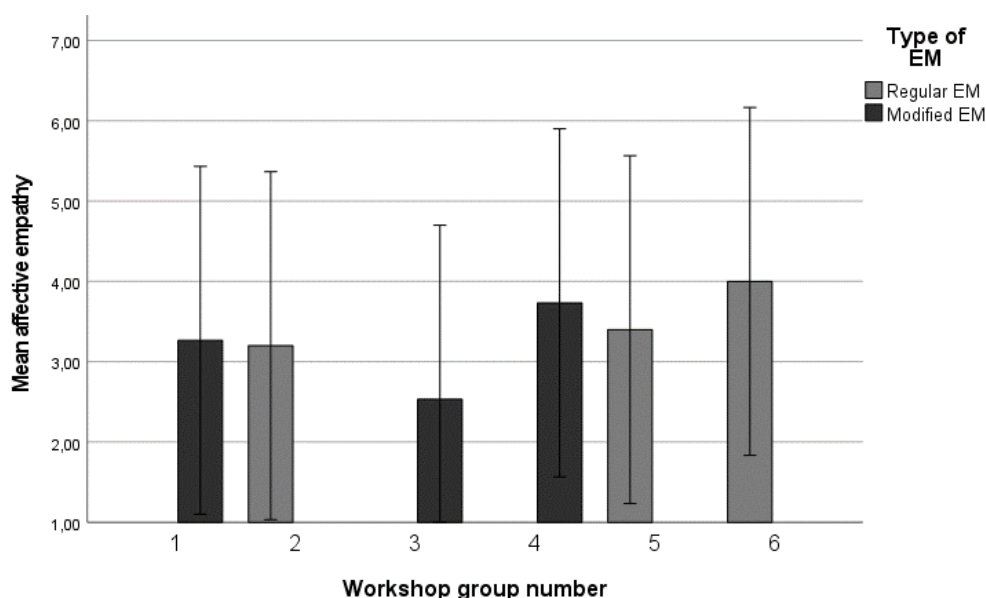
The mean affective empathy scores per workshop group number and type of EM can be seen in Figure 9. As seen before with cognitive empathy, the mean scores of affective empathy differ a lot per group, especially the difference between group 3 and 4 from the modified EM condition. In addition, it is notable that the error bars are large for each workshop group which indicates that the data spreads a lot from the mean.

To statistically explore the differences per workshop group, the file was split based on EM type and a MANOVA with workshop group as a factor was performed. This test found one significant effect of workshop group on cognitive empathy in the regular EM condition $F(2, 9) = 7.370$, $p = .024$, partial $\eta^2 = .71$. This effect can also be seen in Figure 9, where we see that participants from the sixth workshop on average scored higher on cognitive empathy that the other workshop groups from that condition.

No significant effect was found for workshop group on cognitive empathy in the modified EM condition $F(2, 9) = 1.019$, $p = .42$, partial $\eta^2 = .25$. Additionally, no significant effect was found for workshop group on affective empathy in the regular EM condition $F(2, 9) = 0.191$, $p = .83$, partial $\eta^2 = .60$. Furthermore, no significant effect was found for

Figure 9

Bar Chart with Error Bars of Mean Affective Empathy Scores per Workshop Group Number and Type of EM

workshop group on affective empathy in the modified EM condition $F(2, 9) = 0.342$, $p = .72$, partial $\eta^2 = .10$.
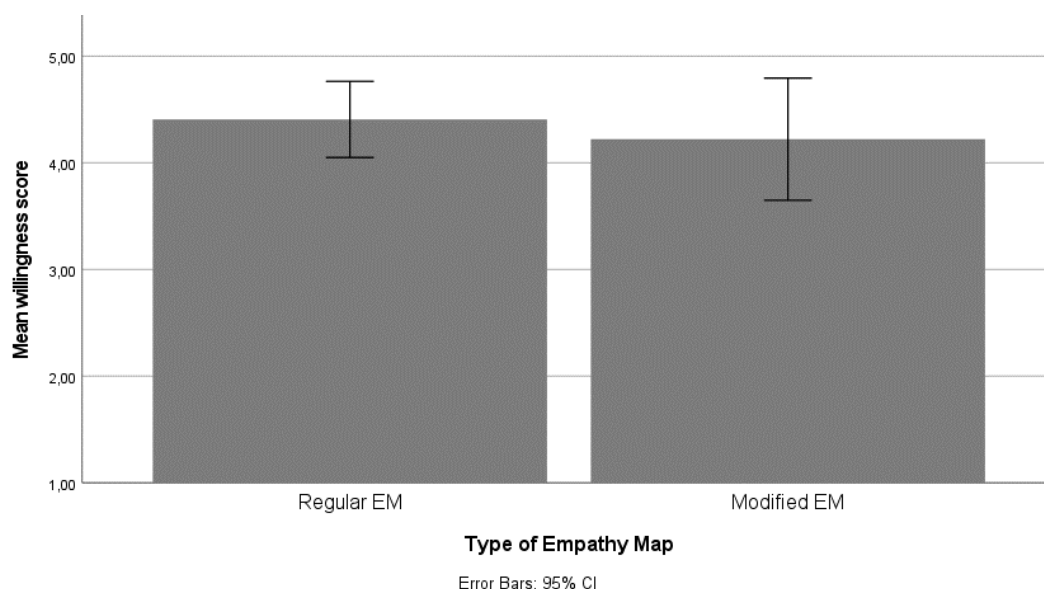
Finally, we will explore whether participants were willing to use the EM template from their workshop using an ANOVA. On average, participants in the regular EM condition had a mean willingness to use score of 4.41 ($SD = 0.45$). For the modified EM condition, the mean willingness to use score was 4.22 ($SD = 0.75$). In Figure 10, we can also see this difference in means.

All assumptions for normality were met, but this did not apply for homogeneity assumptions. The full assumptions check can be found in Appendix I. The ANOVA is fairly robust against the violation of homogeneity assumptions, so no bootstrapping will be performed.

The overall ANOVA was not significant, indicating that there is no effect of EM type on willingness to use $F(1, 18) = 0.400$, $p = .536$, partial $\eta^2 = .02$. Thus, this exploratory test revealed that there is no difference between the regular and modified EM when it comes to the participants' willingness to use it.

Figure 10

Bar Chart with Error Bars of Mean Willingness to Use Score Regarding Type of Empathy Map

Results of the qualitative analysis

All filled in empathy maps can be found in Appendix J. The regular filled in templates contained merely textual insights while the modified templates also included Emojis and visuals. What stood out, was that all participants from the modified EM condition used little to no visuals other than the Emojis even though they were given instructions to use visuals from the magazines. When they were questioned about this, some of them explained that they did not know that it was an option or that it was just easier to work with textual insights since the transcript was also text-based. One participant highlighted the importance of textual insights.

> *"It is also important to have text in there, cause if someone else wants to work with the template, they would understand the written part more." – Participant from workshop 1 (modified EM)*

Overall, the modified EM received more positive feedback than the regular EM. Participants seemed to appreciate the use of Emojis to visualise emotions but also to help read the finished map. Participants also thought that the best- and worst-case scenarios were a good addition.

> *"I really like the best- and worst-case scenarios because it makes me think about what could happen, like futuring." – Participant from workshop 1 (modified EM)*

Participants from the regular EM condition mentioned that the template was easy to use and that it gave a good overview of a textual interview.

Both templates received similar suggestions. Some participants had to ask multiple times what the different fields of the original EM meant. In addition, participants from both EM conditions had trouble with interpreting the 'hear' field.

"The 'hear' and 'see' categories were difficult. Especially 'hear'. I could not quite make out from the transcript what exactly they were hearing or how the environment affected them." – Participant from workshop 6 (regular EM)

Some participants recommended implementing more instructions to always have the elaboration of the fields at hand.

Discussion

This research focused on the following research question: *How can we add context to empathy maps, and does this increase designers' empathy towards their target users?* The first part of the research question, "*How can we add context to empathy maps",* was answered in a co-creation session and follow-up focus group. This resulted in a modified EM template that contained the original fields of the regular EM together with instructions to give their persona a name, find a face for their persona, use visuals to illustrate situations, use Emojis to visualise feelings, and make up best- and worst-case scenarios. Overall, using more visuals was the biggest category of EM changes that could add context, which is no strange finding as designers work in a mainly visual field. Additionally, to successfully develop the empathy component it is important to visualise the perspective of the user (Peixoto & Moura, 2020).

The second part of the research question, *"Does this (the modified EM) increase designers' empathy towards their target user?",* was explored using statistical tests. The results of the MANOVA found no support for the hypothesis 'adding more context to empathy maps increases cognitive and affective empathy of designers towards their target user'. On the contrary, the mean cognitive and affective empathy scores were somewhat higher for the regular EM. This difference was not significant, but was remarkable as it was not hypothesised and the prototype of the modified EM was developed in a co-creation with designers that aimed to improve the template. When further exploring the data, there was a significant effect for workshop group on cognitive empathy in the regular EM condition.

However, cognitive empathy was measured with the ARS scale which had a minimally acceptable reliability score of α = .65. This means that the items from this scale have a mediocre correlation based on the answers of the participants. Another reason for these outcomes could be because of the small number of participants and therefore this research should be regarded as a first step into the improvement of the EM template.

Improving the template is important, as previous research found that it was limited because it lacked a context field among other reasons (Ferreira et al., 2015). The importance of not forgetting context of use is also discussed, since it helps the designer understand situations in which the final product will be used (Maguire, 2001). This understanding is beneficial to the empathic design process, where a designer needs to step in and out of the world of their target user (Kouprie & Sleeswijk Visser, 2009). Viewing situations from the user's perspective allows for a better development of the empathy components (Peixoto & Moura, 2020). Additionally, gaining empathy for the target users is critical since it increases the willingness to help and understand them (Reynolds & Scott, 1999). Thus, increasing empathy could aid designers in actively preventing edge cases and therefore it is needed that methods and tools used in the design process become more accurate and increase designers' empathy.

The EM was originally created to increase the empathy of a designer (Gray et al., 2010) and the modified EM of this study aimed to improve this template with input from industry experts. An insight gained about the new template is that in the field of design there is a preference for visual expression, in this case in the form of Emojis, illustrating situations, and persona profile pictures. For example, visualising emotions with Emojis led to a better overview and readability of the map. Adding context in the form of visuals did not lead to a significant increase of empathy in this research, but the feedback of the modified EM was more positive than feedback of the regular EM. Therefore, this research should be considered a first exploratory step towards an improved EM. In addition, some limitations of this study should be considered and tried to be prevented in future endeavours.

Limitations and future work

  This research comes with a few limitations. The number of workshop participants was too little to be able to draw concrete conclusions about the templates. The modified EM can only be evaluated in a summative way with a larger sample in both conditions. Additionally, there were not enough participants in the Human Subject Pool of Tilburg University, therefore some convenience sampling took place to fill each workshop group with three participants. Most of the participants were students from Tilburg University, which could have influenced their knowledge about the manipulations of the experiment. Another reason for the particular outcome of this study could be that the participants that were sampled out of convenience have a relationship with the researcher and therefore gave socially desired answers. Future research should test whether the new template brings significant improvements from the old template and how the new template is experienced in practice, on an actual design task with a larger sample in both conditions.

  Another limitation could lie in the transcript that participants from the co-creation and workshops had to work with. The transcript was not real and was based on questions and answers of the SHARE dataset. Therefore, the given information was fictional and might not be as empathy evoking as data from a real interview transcript. Participants from the co-creation session also suggested that they would ask more in-depth questions in the interview to be able to fill the EM with more precise insights. It was not possible for this research to perform real interviews for the exercises because of time limitations. It is recommended that in future tests of the template a different transcript is used where participants can gather their insights from.

  Another direction for future research lays in further improving the modified EM template. Participants of this study liked the additions and were willing to use the modified EM, but admitted that they missed clear instructions within each field and would like to see a more visually appealing EM. These could also be factors that influenced the outcome of the empathy scores, since the template itself did not evoke empathy and the participants made little to no use of the visuals from the magazines. This last point could be due to the fact that

the workshops were offline and it is easier to add visuals to a digital template. Participants could then also search for their own visuals instead of having to pick images from a magazine. These suggestions could be implemented into the modified EM to further improve the template and see whether that would enhance the empathy scores.

Conclusion

This research resulted in a proposal for a modified EM template that aimed to increase cognitive and affective empathy in designers. The modified EM was created as a result of a co-creation session and follow-up focus group with designers. It differed from the regular EM because of the instructions to give their persona a name, find a face for their persona, use visuals to illustrate situations, use Emojis to visualise feelings, and come up with best- and worst-case scenarios. In workshops, the old and new templates were tested to see which one would perform better in terms of increasing empathy. No statistically significant difference was found between the two templates on empathy. It is worth mentioning that the regular EM scored better, but this research should be regarded as exploratory since there were not enough participants in the sample. The EM should be further improved and tested in the future, as it forms a solid base to be the empathy-evoking tool that generates a better understanding of the user and thus could aid designers in preventing edge cases.

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Appendix A

Co-creation Homework Assignment (in Dutch)

Co-creatie voorbereidende opdracht
Georganiseerd door Eva Riksen

Voor de co-creatie sessie op zondag 15 mei om 13:00 vraag ik jullie om één opdracht voor te bereiden. We gaan ons tijdens de sessie focussen op de empathy map. Dit is een persona-tool die designers gebruiken in de onderzoeksfase van het designproces. Het template verschilt van een regulier persona template doordat de nadruk gelegd wordt op de gedachten en gevoelens van de doelgroep met als doel meer empathie te creëren.

Om bekend te raken met deze tool, vraag ik je om de volgende informatie goed door te lezen en vervolgens het empathy map template op de laatste pagina in te vullen aan de hand van de gegeven informatie. Succes!

1. Achtergrondinformatie

Bedrijf NotAlone doet onderzoek naar oplossingen voor ouderen die zich eenzaam voelen. Zij hebben onderzoek gedaan door vijf personen te interviewen die de doelgroep representeren. NotAlone vraagt je om het transcript van het onderzoeksteam om te zetten in een empathy map, zodat je deze kan gebruiken tijdens je designproces.

1. Transcript

Lees het volgende transcript van interviews met vijf personen. Let op, de interviews zijn individueel afgenomen, maar voor het gemak zijn de antwoorden van de personen onder elkaar bij de vragen gezet.

T is een man van 74 jaar.

A is een vrouw van 81 jaar.

L is een vrouw van 77 jaar.

M is een man van 71 jaar.

G is een man van 85 jaar.

Vraag 1: Kunt u wat vertellen over uw huidige woonsituatie?

- T: Ik woon alleen in een twee-onder-een-kapwoning. Hier heb ik wel een aantal aanpassingen aan laten doen, zoals een stoeltjeslift plaatsen zodat ik de trap op en af kan. Zo mobiel ben ik namelijk niet meer.
- A: Sinds het overlijden van mijn man woon ik in een verzorgingstehuis in een klein dorpje. Ik probeer sindsdien op mijn geld te letten en besteed daarom niet zoveel aan mijn inrichting. Dit vind ik best jammer want het voelt nu best leeg.
- L: Ik woon in een verzorgingstehuis en dit bevalt prima.
- M: Ik woon nog steeds fijn in mijn eengezinswoning. Ik kan namelijk niet zo goed wennen aan nieuwe situaties, dat is erg lastig voor mij.
- G: Ik woon alleen in een seniorenwoning met een balkon.

Vraag 2: Hoe is uw band met uw familieleden?

- T: Ik ga nog wekelijks bij mijn zoon en zijn familie op bezoek op zondag. Ik kijk daar de rest van de week erg naar uit want verder heb ik niet zoveel te doen.
- A: Ik heb een dochter maar die woont aan de andere kant van het land. Die zie ik daarom maar zelden. We bellen wel af en toe.
- L: Goed, maar ik zou ze allemaal wat meer willen zien. Ik heb twee kinderen die al een eigen gezin hebben en een broer. Die broer spreek ik wat minder.
- M: Ik heb eigenlijk weinig contact met mijn familie en dat vind ik wel jammer. Zij komen wel eens bij mij op bezoek, maar ik kan niet zo vaak naar hen toe. Dat is voor mij een hele opgave.
- G: Kan beter, ik ben namelijk geen beller. Ik vond dat vroeger al niks en ik krijg nog steeds de rillingen als mijn beltoon over gaat. Helaas is het daardoor minder makkelijk om op afstand contact te houden met anderen.

Vraag 3: Hoe zorg u ervoor dat u nieuwe mensen blijft ontmoeten?

- T: Ik ga door de week bij de buren op bezoek en verder spreek ik eigenlijk geen nieuwe mensen. Lopen gaat niet zo goed meer, vooral in de avond als het gaat schemeren en ik de weg niet zo goed meer zie.
- A: Niet... Ik heb contact met de verpleging. Met mijn buren vind ik het wel prima om af en toe een potje te kaarten, maar het zijn niet echt vrienden van mij.
- L: Goede vraag... Dit gebeurt niet zo gauw doordat ik niet goed mee kan doen aan fysieke activiteiten. Ik kan mijn rechterhand namelijk niet goed gebruiken.
- M: Dit doe ik eigenlijk niet. Ik vind het lastig om nieuwe connecties te maken, maar daardoor voel ik mij wel vaker alleen. Mijn beste vriend was mijn buurman, maar die is onlangs overleden.
- G: Ik ga één avond in de week naar de gezamenlijke ruimte in mijn appartement om spelletjes te spelen. Dat is gauw al wel genoeg inspanning voor mij.

Vraag 4: Hoe gebruikt u het internet voor sociale contacten?

- T: Ik speel op mijn tablet een aantal woordspelletjes. Dat speel je dan tegen iemand anders en ik chat soms met mijn vaste tegenspelers. Meestal gaat het wel gewoon over het spel. Ik vind het best lastig om via het internet te praten met vreemden.
- A: Ik snap daar niet zoveel van. Misschien als ik het beter zou begrijpen zou ik meer contact kunnen hebben met mijn dochter. Voor mij zijn de letters vaak klein en in de avond zie ik de kleuren vaak wat minder goed.
- L: Ik kan prima beeldbellen op mijn telefoon met mijn kinderen. Maar als ik ergens anders mee bezig ben dan mis ik wel eens een telefoontje omdat ik het niet zo snel kan bedienen met een hand.
- M: Ik gebruik Facebook om een beetje te zien wat kennissen en familieleden aan het doen zijn. Verder volg ik daar een aantal pagina's die leuke berichten hebben om de tijd mee te doden. Whatsapp gebruik ik om afspraken te maken met familie.
- G: Ik gebruik geen internet want dat vind ik allemaal te druk. Er gebeurt te veel op zo'n klein scherm en dan zit er weer geluid bij. Ik vind TV al genoeg en dat speelt ook wel eens op mijn zenuwen.

Vraag 5: In hoeverre beperkt uw gezondheidssituatie uw contact met anderen?

- T: Mijn gezondheidssituatie beperkt mij vrijwel niet, want ik kan alles nog zelfstandig.
- A: Ik ben best afhankelijk van de verpleging. Daar praat ik eigenlijk de hele dag mee waardoor ik niet gauw nieuwe mensen aanspreek.
- L: Ik kan mijn rechterhand niet goed gebruiken. Dat maakt het toch lastig om mee te doen aan sociale activiteiten zoals kaarten. Ook activiteiten zoals boodschappen doen is voor mij erg lastig. Ik probeer naar de supermarkt te gaan als het rustig is, maar dit lukt niet altijd.

- M: Zoals ik eerder zei vind ik het spannend om buiten mijn huis te gaan. Ik heb regelmatig last van paniekaanvallen, vooral bij tijdsdruk. Helaas moet tegenwoordig alles steeds sneller en daar ben ik niet meer voor gemaakt.
- G: Ik ben mij ervan bewust dat ik snel geprikkeld ben, wat toch wel mijn vriendschappen beperkt. Mensen weten niet zo goed hoe ze ermee om moeten gaan als ik te direct uit de bocht kom.
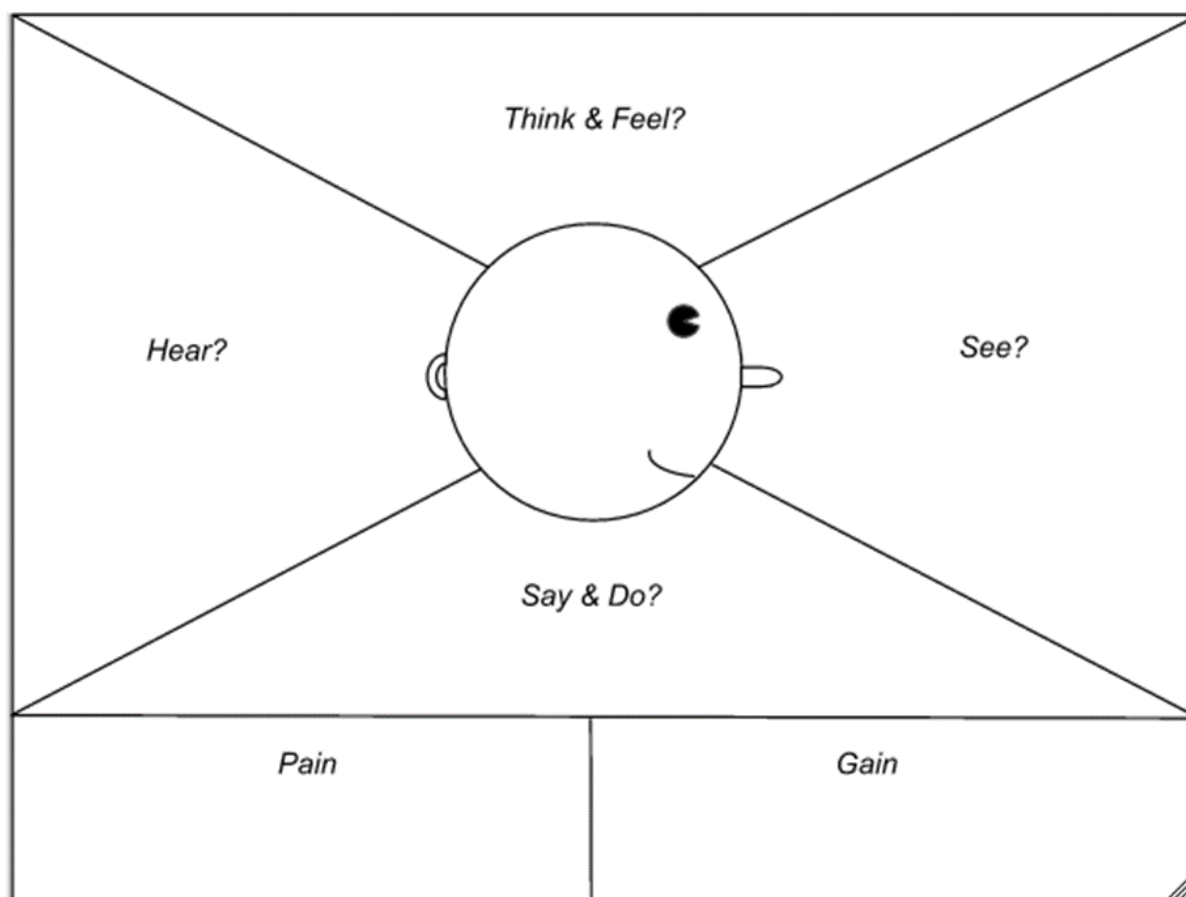
EINDE TRANSCRIPT

1. Empathy map template

Hieronder vind je het empathy map (EM) template. Het bestaat uit zes vlakken:

- See - Hoe ziet de omgeving van de gebruiker eruit?
- Say and Do - Wat is de houding van de gebruiker in het openbaar?
- Think and Feel - Wat denkt en voelt de gebruiker?
- Hear - Welke invloed hebben anderen op de gebruiker?
- Pain - Welke irritaties en onzekerheden heeft de gebruiker?
- Gain - Welke doelen en wensen heeft de gebruiker?

Vul de zes vlakken van de EM in met de informatie uit het transcript. Op de volgende pagina vind je de EM. Stuur je ingevulde EM via Whatsapp of mail: e.m.riksen@tilburguniversity.edu

Appendix B

Setup Plan Co-creation (in Dutch)

Datum

15-05-2022

Locatie

Rotterdam

Sessieleider

Eva Riksen

Participanten

- 2 UX-designers
- 2 UX/UI-designers

Doel van de co-creatie sessie

Hoe kunnen we de empathie van designers voor hun doelgroep verhogen door het toevoegen van meer context aan de empathy map tool?

Materialen

- Post-its
- Pennen
- Huiswerk opdrachten
- COCD-box template

Ruimte

- Rustige open ruimte
- Geen telefoons
- Informele opstelling

PROGRAMMA

Introductie (5 min.)

Hallo! Welkom bij deze co-creatie sessie en bedankt dat jullie hier allemaal zijn. Mijn naam is Eva en ik zal deze sessie leiden. Allereerst vraag ik jullie om het toestemmingsformulier in te vullen. We doen eerst een korte voorstelronde en daarna zullen we beginnen. Hebben jullie er bezwaar tegen dat deze sessie wordt opgenomen?

Bespreken huiswerkopdracht (10 min.)

Alle participanten hebben voor de sessie een leeg EM template ontvangen met een datadocument. Vervolgens worden de opdrachten algemeen besproken. De participanten worden de volgende vragen gesteld:

- Hoe ervaarde je het gebruik van de EM als persona tool?

- In hoeverre vind jij deze tool bruikbaar in het designproces?
  - Gebruik je de tool zelf wel eens?
- Wat zijn de sterke punten van de EM?
- Wat zijn de zwakke punten van de EM?

Kennisdeling – wat weten we? (5 min.)

- Wat viel op aan de voorbereidende opdracht?
  - Contextuele factoren zijn goed meegenomen, maar dat komt doordat volledige zinnen uit het transcript werden gebruikt in het template. Hierdoor is de informatie gedetailleerd, maar wel onoverzichtelijk.
  - Het is bij een enkeling niet gelukt om een inzicht binnen een bepaalde categorie te plaatsen
  - Er zijn teveel verschillende kenmerken waardoor deze "persona" extreem uiteenloopt
  - Het lijkt lastig om de personen van de interviews goed samen te vatten in één persona
- Wanneer er niet goed wordt nagedacht over designs kunnen er gekke en vervelende situaties ontstaan. Neem bijvoorbeeld Facebook's "Year in Review" waarbij hoogtepunten van je afgelopen jaar worden weergegeven in een video. Er worden foto's van je profiel gepakt, zo kan er bijvoorbeeld een foto van een overleden familielid tussen zitten. Designers van het concept houden hier geen rekening mee, doordat de groep die dit overkomt erg klein is. Toch kan het een grote impact hebben op de gebruikservaring van een individu. Deze ontwerpkeuzes die impact hebben op een kleine groep.
- Uit wetenschappelijk onderzoek is gebleken dat de empathy map gelimiteerd is. Dit doordat je alleen maar kan werken met de informatie die je wordt gegeven. Daarnaast hebben contextuele inzichten nog geen concrete plek binnen de emapthy map.
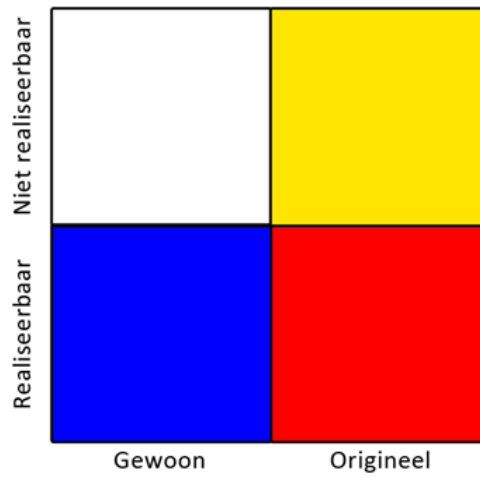
Divergente fase (30 min.)

1. Op een scherm/ vel papier/ whiteboard wordt de volgende vraag opgeschreven: *Hoe kunnen we de empathie van designers voor hun doelgroep verhogen door het toevoegen van meer context aan de empathy map tool?*
2. Elke participant krijgt een pen en een aantal post its. De participanten krijgen maximaal tien minuten om zoveel mogelijk ideeën op de post its te schrijven.
3. Wanneer de tijd om is of iedereen klaar is met het opschrijven van de ideeën worden deze geëvalueerd. De participanten mogen nu om de beurt de ideeën presenteren en hun achterliggende gedachten erbij vertellen. Ideeën die overeenkomen of bij elkaar horen worden door de groep bij elkaar gelegd. Het idee is dat er een discussie ontstaat.
4. Tot slot worden er foto's gemaakt van de categorieën en gaan we verder met de convergerende fase.

PAUZE (5 – 10 min.)

Convergente fase (30 min.)

1. De ideeën uit de divergente fase worden gecategoriseerd door middel van de COCD-box. Deze wordt op tafel gelegd of aan de muur gehangen.
2. Samen bespreken de participanten welke ideeën in welk van de drie kleurvlakken van de box hoort:
   - Blauw vak: Gewone ideeën die realiseerbaar zijn.
   - Rood vak: Innovatieve, originele ideeën.
   - Geel vak: Originele ideeën, maar (nog) niet realiseerbaar.

1. De ideeën die het meest origineel zijn volgens de groep en ook nog realiseerbaar zijn, winnen het van de andere ideeën.

Appendix C

Co-creation Coded Transcript

Table 1

Co-creation in Vivo Coding Table with Quotes

Coded term	Participant quotes
Willingness to use EM	P1: I think it is better than a regular persona. A persona is a summary of your interviews that is focused on best case scenarios, but that is not that realistic. P4: I try to use it at work, but I do not have a specific target audience that I can interview, so I mostly have to use available data and make assumptions.
Advantages of EM	P3: I thought 'Think and Feel' was a good area because you really started looking at how that person feels about something and then you also came to conclusions. P4: With the part 'Say and Do' you could also describe the behaviour really well. P2: I liked 'See' because it gives you an idea of what the person is seeing.
Disadvantages of EM	P1: I thought the 'Hear' part was the least clear, cause the insights you could put there could also fit in 'Think and feel' and 'Say and do'. P4: I put in entire sentences of the transcript because I was afraid that I would be making assumptions if I did not. ALL: Some insights fit into multiple fields. P4: I also noticed that I was trying to come up with solutions in between. I really got stuck, because one person finds something difficult and the other does not find it difficult. So I had to stop coming up with ideas of my own.
Recommended original ideas	P4: The most original, feasible idea is to use more visuals per subject. So basically, a new template design with a special box for images and photos of the target group per box. P4: And then also create a legend with Emojis that you can use to visualise emotions and their meaning.

	P4: The next idea is to emphasize best- and worst-case scenarios. So you can brainstorm about your edge cases.
Recommended normal ideas	P4: Also under 'normal' ideas you can add name and face so that the empathy map becomes a bit more human.
Non-feasible ideas	P4: Then at 'non feasible' and 'normal' we have 'more depth in the interviews'. This is of course not possible if you have a separate research team and you do not conduct the interviews yourself. P4: In this block we also put the idea of involving the target group in the creation of the empathy map, which would take too much time. P4: At 'original' and 'non feasible' we have an idea of making a film of the person and drawing the life of your target group. P1: The ideas are not feasible because they cost more time and money.

Appendix D

Focus Group Coded Transcript

Table 2

Focus Group in Vivo Coding Table with Quotes

Coded term	Participant quotes
Emoji feedback	P4: I like the Emojis. P4: 'Loves it' and 'happy', what is the difference in level between them. They are both very positive. Is there also one that is medium positive? Maybe add a 'satisfied' Emoji. P3: Maybe include a neutral Emoji, as there can be situations that are relevant to your concept but have a neutral emotion. P4: I'm a bit sceptical about 'loves it'. All the others are really emotions and this is a thought or feeling. 'Loves it' and 'happy' are on the same level, but 'happy' is an emotion. P2: I like that you made a legend with those Emojis.
Scenario feedback	P2: I think it is good that you put the worst- and best-case scenario under the pain and the gain since they are similar. P4: Maybe there should be an example with each case field. [...] My first thought here was: Wait a minute, what am I designing? Do I already know what I am designing here? But I think you mean worst case scenario as in that they have no knowledge of the internet among seniors, for example. Otherwise, you are going to think too much about what you are designing. P4: Add a sentence such as "Which user traits could limit the design process or solution?" or something similar.
Styling feedback	P4: I like it. I had the template horizontal in my mind, haha. But this is fine. It is not a must because this is the same idea but vertically. P1: I personally would like to see more attractive styling. What I had in mind would deviate from what the empathy map is, but I understand that the template should be recognisable.

Instruction feedback	P4: I like the way it is, but the descriptive text above it... I had to read it three times before I read that it was also about photos.
	P3: I think I would work with bullet points, because now you quickly read over it and then you think: "Oh yes, I can use Emojis." And you don't read the rest.

Appendix E

Ad Response Sympathy (ARS) and Ad Response Empathy (ARE) Scale Items

The following instructions were used for these statements: "For the empathy map you just filled in, please rate how descriptive each of the following statements is of how you personally reacted to this activity," measured on a seven-point scale (1 = Not at all descriptive/ 7 = Very descriptive).

ARS items:

1. Based on what was happening in the transcript, I understood what the interviewees were feeling.

2. Based on what was happening in the transcript, I understood what was bothering the interviewees.

3. While filling in the empathy map, I tried to understand the events as they occurred.

4. While filling in the empathy map, I tried to understand the interviewees' motivation.

5. I was able to recognize the problems that the interviewees in the transcript had.

ARE items:

1. While filling in the empathy map, I experienced feeling as if the events were really happening to me.

2. While filling in the empathy map, I felt as though I were one of the interviewees.

3. While filling in the empathy map, I felt as though the events from the transcript were happening to me.

4. While filling in the empathy map, I experienced many of the same feelings that the interviewees portrayed.

5. While filling in the empathy map, I felt as if the interviewees' feelings were my own.

Appendix F

Willingness to Use the EM Persona Scale Items

The following instructions were used for these statements: "Please indicate how much you agree with the following statements about the willingness to use the empathy map persona template" measured on a five-point scale (1 = Strongly disagree/ 7 = Strongly agree).

1. I would make use of this persona in my task of designing a product.

2. I can imagine ways to make use of the persona information in my task of designing a product.

3. This persona would improve my ability to make decisions about the customers it describes.

Appendix G

Coded Transcript of the Workshops

W1 = Workshop 1 (modified EM)

W2 = Workshop 2 (regular EM)

W3 = Workshop 3 (modified EM)

W4 = Workshop 4 (modified EM)

W5 = Workshop 5 (regular EM)

W6 = Workshop 6 (regular EM)

Table 3

Workshop in vivo coding table with quotes

Coded term	Participant quotes
Modified EM positive feedback	W1: The first part is more about explicit needs that you get from the transcript and the latter part is more about implicit needs that needs more elaboration from us. W1: On the latter part of the template, we started with pain and we tried to actively remember what they were going through. W1: The template is very nice and I like that it gives you room to think more about what is behind things. W1: I really like the best- and worst-case scenarios because it makes me think about what could happen, like futuring. W3: We did not only include the things they literally said but also found things in between the lines and tried to include that as well. W3: I think the Emojis help with understanding and reading the map. W4: I find the worst-case scenario the most interesting. W4: The best- and worst-case scenarios are very interconnected; if we do not reach the positive with our solution, we will definitely reach the negative scenario.
Modified EM suggestions	W3: 'Hear' was a tough one cause the transcript did not directly tell us what they hear. I could kind of imagine what it could be.

Regular EM positive feedback	W2: The template was easy to use. W6: The empathy map gives a good overview of a textual interview.
Regular EM suggestions	W2: 'Hear' was difficult. There was nothing specific in the interviews about what the interviewees hear. They had little contact, so not many outside influences. W2: You miss the digital aspect in the template because you are looking for a digital solution. I think there could be another field with how they use your solution and what technology they use. W5: The template missed some instructions. I had to ask what the fields meant multiple times. W6: The 'hear' and 'see' categories were difficult. Especially 'hear'. Couldn't quite make out from the transcript what exactly they were hearing or how the environment affected them. W6: An extra legend would have been nice to explain exactly what all categories meant, maybe with some examples.
Reasons for not using pictures in modified EM	W1: I did not know that this was possible, maybe mention it more explicitly. W1: The reason that we did not use a lot of visuals was because we got the information from a text so it is easy to write down what you read. When we were coming up with concepts ourselves in the latter part it was easier to try to visualise them. W1: It is also important to have text in there, cause if someone else wants to work with the template, they would understand the written part more. W3: We focused mainly on faces in the magazines to find a face for our persona, but we did not think of any other visuals to include. W3: Most insights we put in were about emotions and how people feel and that is kind of hard to visualise. We mostly used the Emojis for that.

Appendix H

Assumption Checks for MANOVA (Cognitive and Affective Empathy per EM Type)

On average, participants in the regular EM condition had a mean cognitive empathy score of 5.91 (SD = 0.56), the z-score for skewness was 0.39 and the z-score for kurtosis was -0.99. The mean cognitive empathy score of participants from the modified EM condition was 5.38 (SD = 0.85), the z-score for skewness was 0.09 and the z-score for kurtosis was -0.88. The VR-test was 2.30, so the assumption of homogeneity is not met, but a MANOVA is fairly robust against the violation of this assumption.

On average, participants in the regular EM condition had a mean affective empathy score of 3.53 (SD = 1.47), the z-score for skewness was 0.05 and the z-score for kurtosis was – 0.17. The mean affective empathy score of participants from the modified EM condition was 3.18 (SD = 1.64), the z-score for skewness was 0.24 and the z-score for kurtosis was -1.61. The VR-test was 1.24, so the assumption of homogeneity is met.

The final assumption check for a MANOVA, Box's Test of Equality of Covariance Matrices, did not show a significant value, Box's M = 1.79, $F(3, 46080)$ = .514, p = .672. Therefore, this assumption was also met and we will use Wilk's Lambda in the analysis.

Appendix I

Assumption Checks for ANOVA (Willingness to Use per EM Type)

On average, participants in the regular EM condition had a mean willingness to use score of 4.41 (*SD* = 0.45) and the z-score for skewness was -0.20 and the z-score for kurtosis was -0.76. For the modified EM condition, the mean willingness to use score was 4.22 (*SD* = 0.75) and the z-score for skewness was -1.54 and the z-score for kurtosis was 0.93. The assumptions for normality were met. The VR-test was 2.57, thus the assumption of homogeneity is not met. The ANOVA is fairly robust against the violation of this assumption.

Appendix J

Filled in Empathy Map Templates from the Workshops

Figure 11

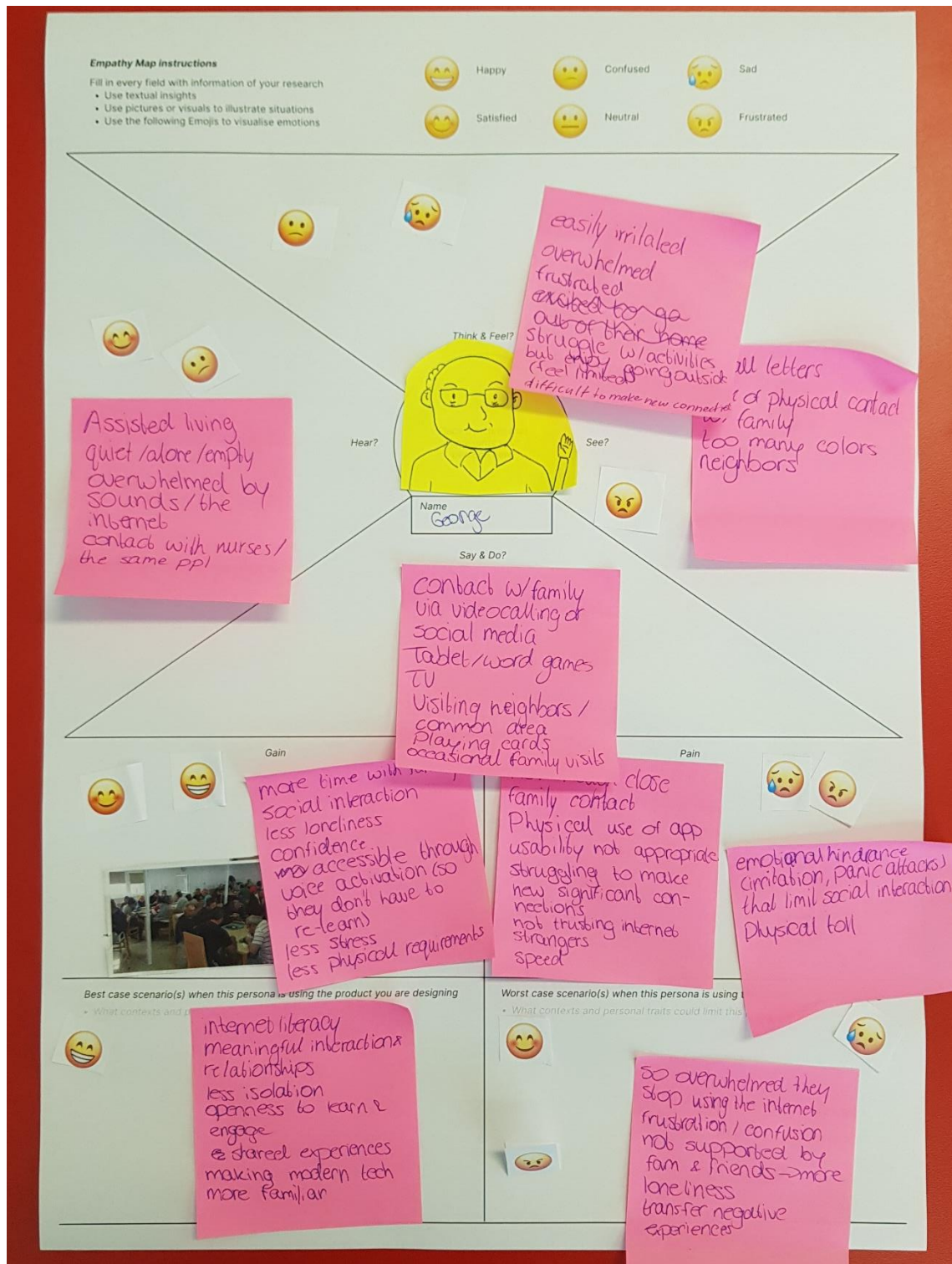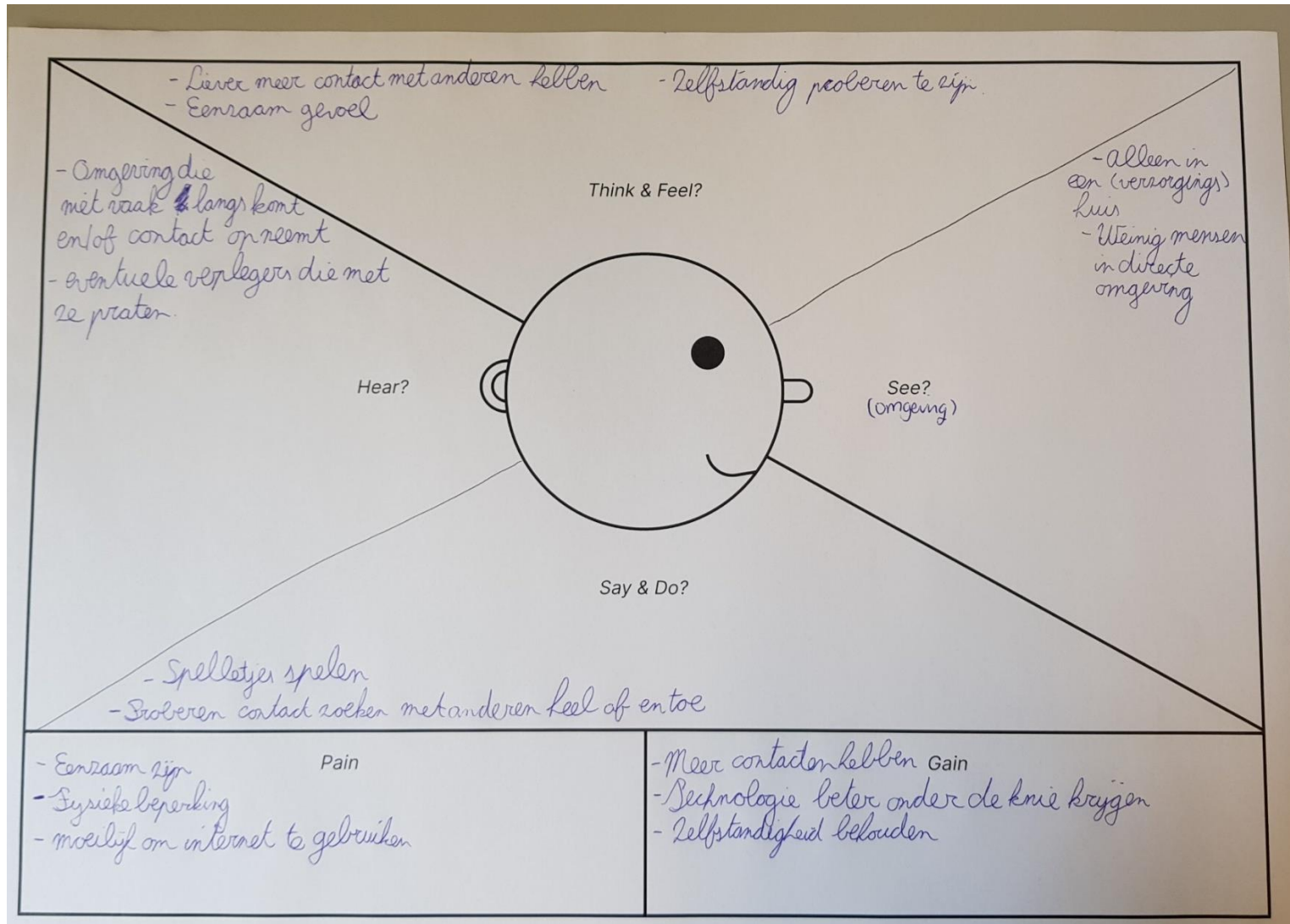*Modified Empathy Map from Workshop 1*
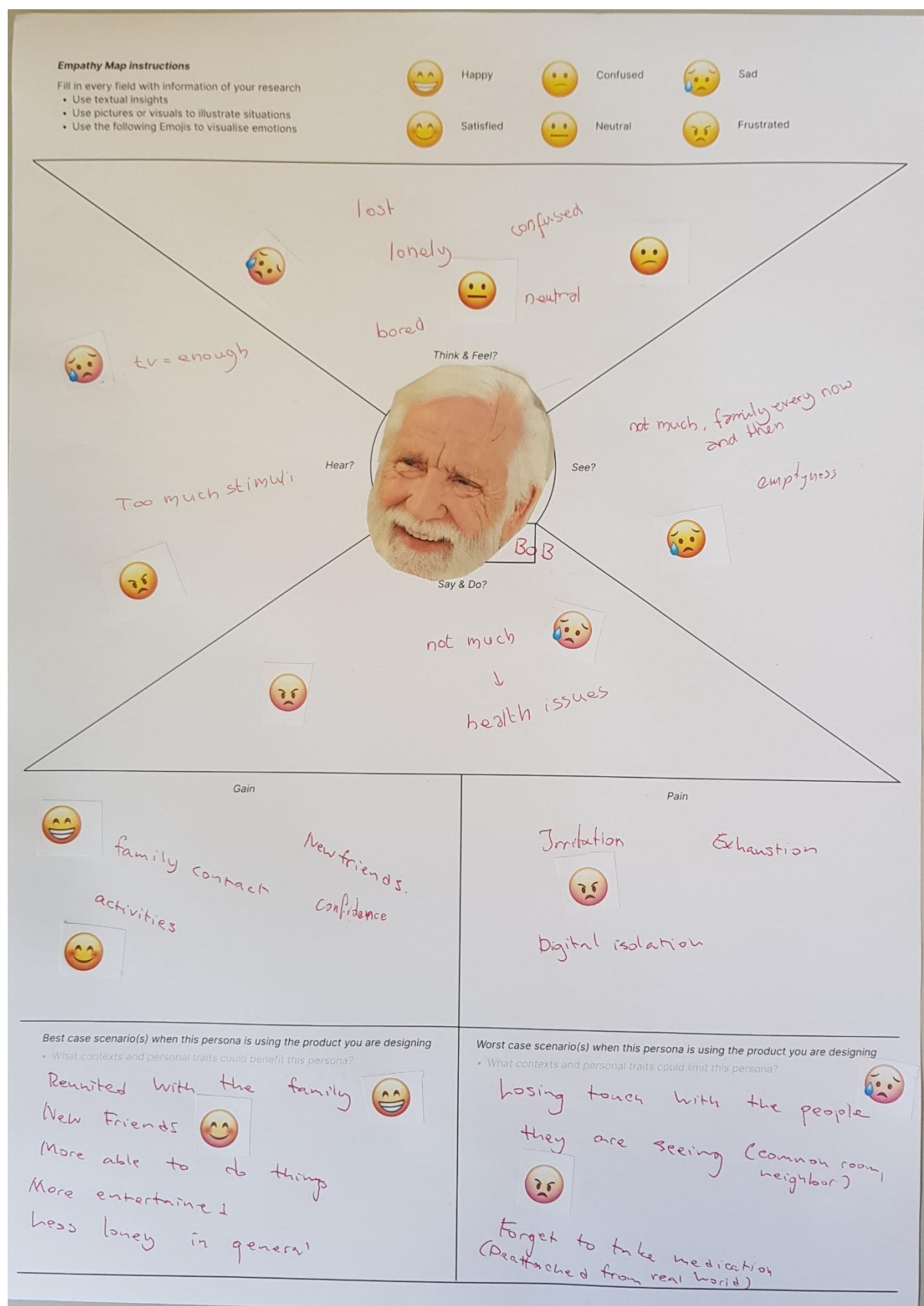
Figure 12

Regular Empathy Map from Workshop 2

Figure 13

Modified Empathy Map from Workshop 3

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Figure 14

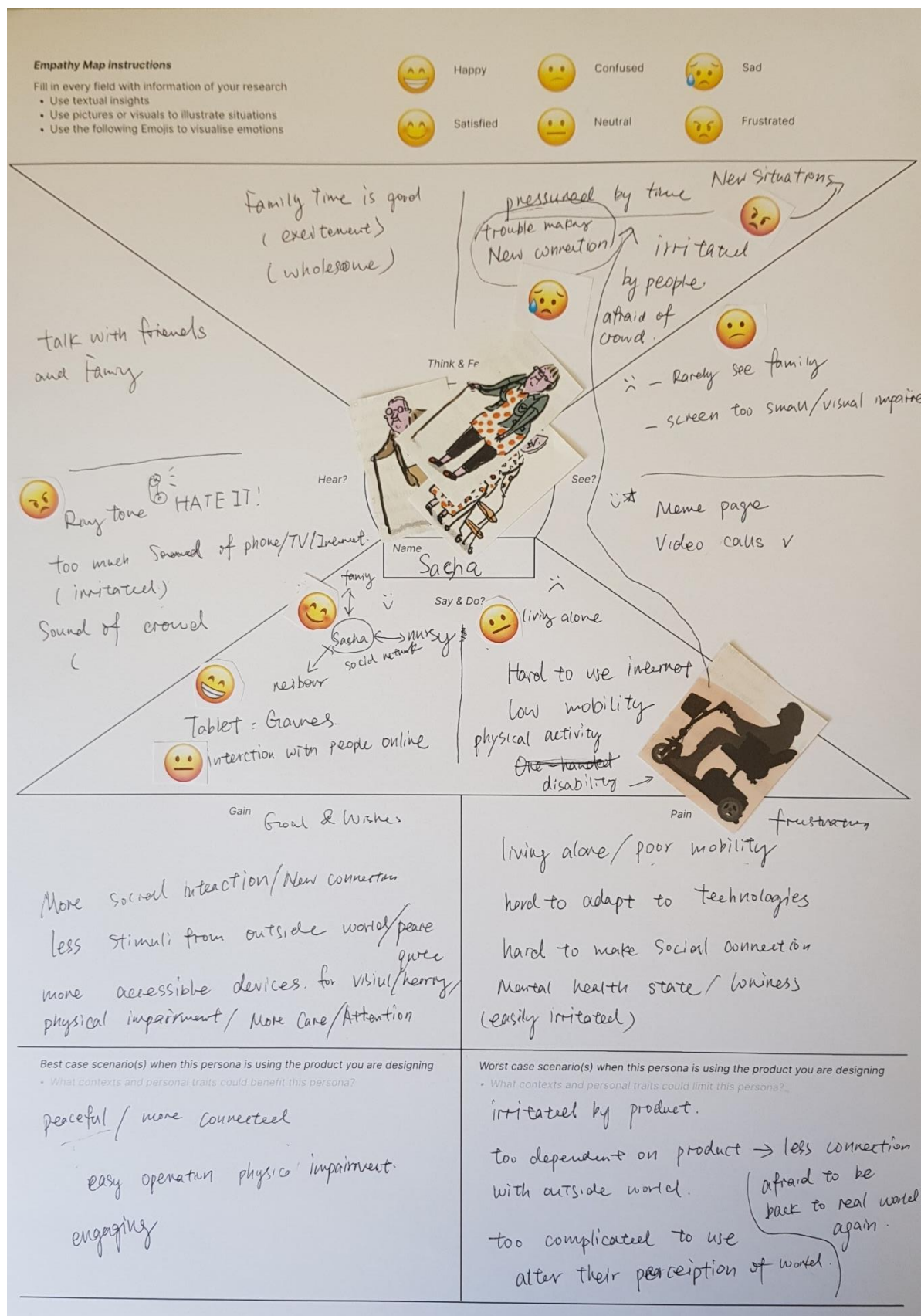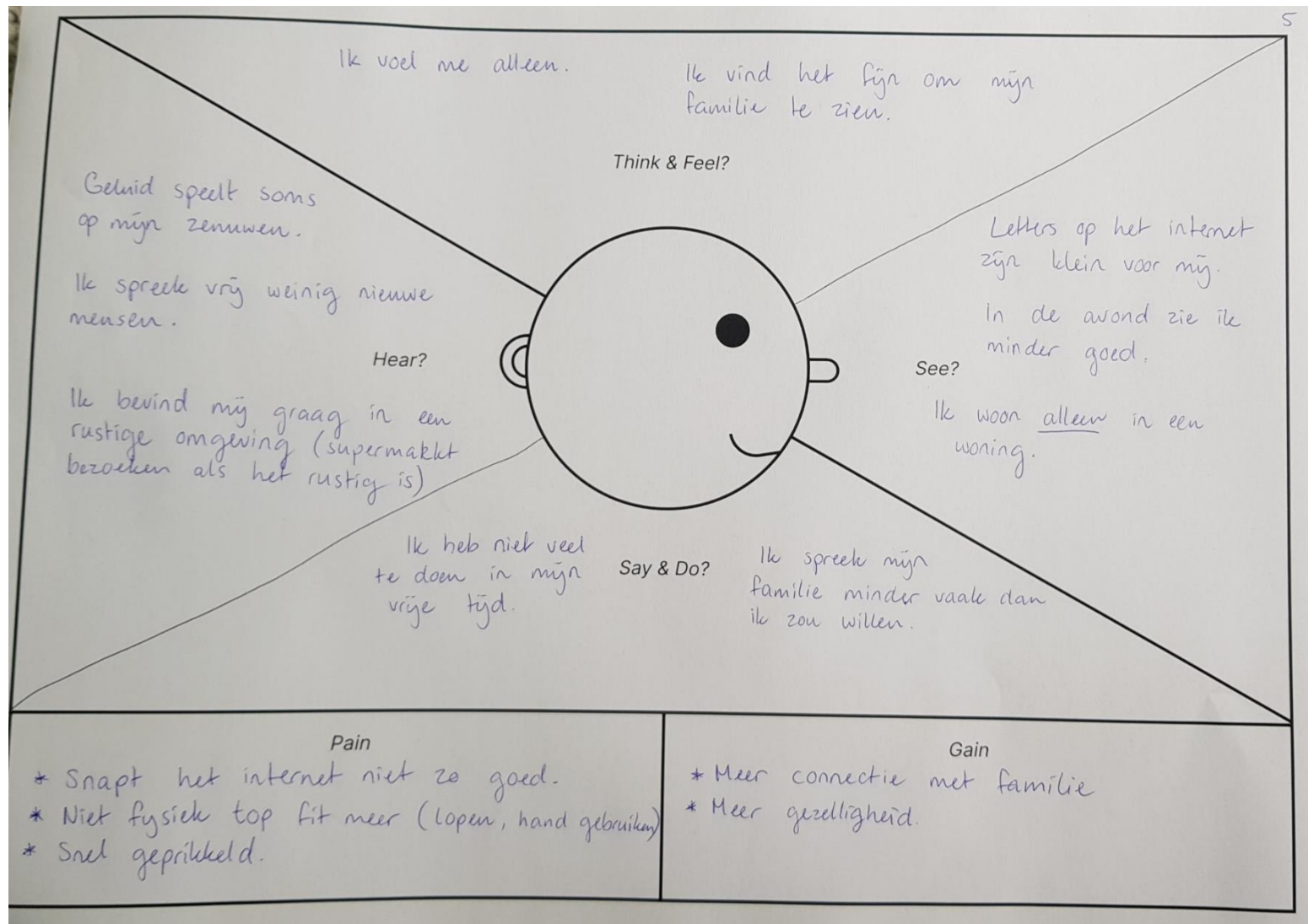*Modified Empathy Map from Workshop 4*

Figure 15

Regular Empathy Map from Workshop 5

Figure 16

Regular Empathy Map from Workshop 6