

FBP report

A report for the final bachelor project of Simon de Vries (1317237).
Handed in on: 27-02-2022; Coach: Yaliang Chuang; Squad: Artifice.
Word count: 11000

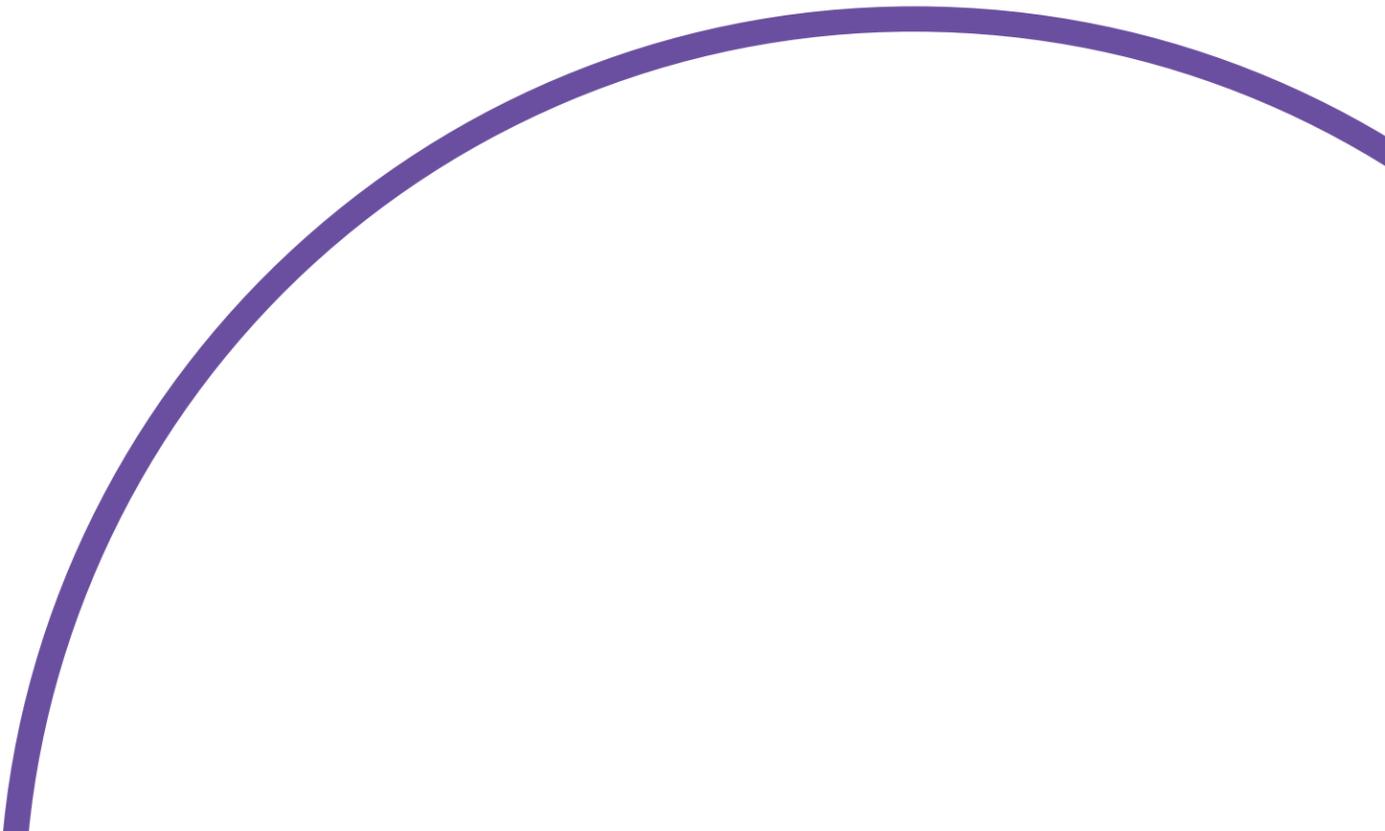


Table of Contents

A. Welcome	3
1. Executive Summary	<u>1</u>
2. Prologue	<u>2</u>
B. Introduction	4
1. Theoretical Background	<u>5</u>
2. Orientation	<u>6</u>
3. Related Works	<u>7</u>
C. Process	9
1. Problem Discovery	<u>10</u>
1.1 AI type for social use	<u>10</u>
1.2 Missing social aspect	<u>10</u>
1.3 General issue to address	<u>12</u>
Conclusion	<u>13</u>
2. Problem Definition	<u>14</u>
2.1 Prototyping	<u>14</u>
2.2 User testing	<u>15</u>
2.3 How to improve sleep	<u>16</u>
2.4 Evaluation of sleep as application	<u>16</u>
Conclusion	<u>16</u>
3. Solution Discovery	<u>17</u>
3.1 New use	<u>17</u>
3.2 How to increase resilience?	<u>17</u>
3.3 What is ACT?	<u>18</u>
3.4 speech protocol for ACT	<u>18</u>
3.5 Agreeableness expression in speech	<u>19</u>
3.6 Modeling the speech protocol	<u>19</u>

3.7 Associations with agreeableness	<u>22</u>
3.8 Physical prototyping	<u>25</u>
Conclusion	<u>27</u>
4. Concept Validation	<u>28</u>
4.1 Test prototype	<u>28</u>
4.2 New prototype	<u>30</u>
4.3 Final test	<u>31</u>
Conclusion	<u>31</u>
D. Results	32
1.1 In short	<u>33</u>
1.2 Design question	<u>33</u>
1.3 Design description	<u>33</u>
1. Final Design	<u>33</u>
1.4 Conversation design	<u>34</u>
1.5 Business	<u>35</u>
2. Evaluation.	<u>36</u>
3. Discussion	<u>37</u>
4. Recommendations	<u>38</u>
5. Conclusion	<u>39</u>
5.1 Growth in PIV	<u>40</u>
6. Personal Growth	<u>40</u>
5.1 Creativity and Aesthetics	<u>41</u>
5.2 Technology and Realization	<u>42</u>
5.3 User and Society	<u>43</u>
5.4 Business and Entrepreneurship	<u>44</u>
6. Personal Growth	<u>45</u>
5.5 Math, Data and Computing	<u>45</u>
References	<u>46</u>

Appendices	47
-------------------	-----------

A. Welcome

Figure 1: the final prototype.



1. Executive Summary

The social implications of future relationships between humans and artificial intelligence (AI) are an urgent topic. However, most work to provoke thought about it is based on speculations on far-future developments in technology. Proceedings in human-computer interaction (HCI) provide guidelines for ethical and usable AI, but don't provide ways to reimagine the way we use AI today.

This project answers the design question: "How might we design a conversational agent with different personalities in agreeableness to provoke thought on the social implications of human-AI relationships in the near future?" The project's goal was to provide an experience that allows people to realistically think about future possibilities for social AI. These thoughts can spark realistic discussion to guide developments in AI.

The design question has been explored in a design process that followed Zendesk's triple diamond. The process consists of four stages: problem discovery, problem definition, solution finding and concept validation. Practices of discursive design and participatory design were used to make the design debatable, human-centered and experiential. Through user studies and expert interviews, a validated design was reached.

The result of the project is Deary: a conversational AI that guides students through Acceptance and Commitment Therapy (ACT). The prototype has a physical embodiment and provides a way to tune the personality of the conversational agent.

Deary is shown to provide an experience on which thoughts on future personal AI products can be based. In future work, it can be better defined whether the product will be a consumer product or a research tool. Through expert opinions or the launch of the product as a minimum viable product, the product can be further developed accordingly.

2. Prologue

A designer should know a little bit about a broad field of knowledge. This knowledge is used to provide solutions that are valuable for society on diverse challenges. It is also used to communicate and connect experts to make the design real.

This exploratory and social role of a designer is what sparked my interest in design. It suits me, as I love exploring. The Artifice squad provided me with the opportunity to explore a highly technical field, to create a human-centered application.

As a designer I want to create quality of life. I believe quality of life comes from being content and seeing aesthetics in your personal situation. This project explores how people can find value in the technology of Artificial Intelligence, whose speculated future developments are often perceived as daunting.

I am grateful for the opportunity to revise this report. It gave me the opportunity to transform deliverables I felt unsatisfied with into a convincing story that I can be proud of. That being said, I wish you a good time reading.

i



Figure 2: the logo of Deary, the end product of this FBP.

B. Introduction

Problem statement

Intimate relationships between robots and human beings may begin to form in the near future. Relationships between artificial intelligence (AI) and humans have many ethical implications that need investigation (Borenstein & Arkin, 2019). For example: how might intimate human-AI relationships influence human-human social contact? The topic is actively being discussed and speculated about in academia and popular media. However, popular media often focuses on the far future and its outcomes are very ambiguous. Meanwhile, proceedings of Human-Computer Interaction (HCI) are grounded in current possibilities and limitations of AI, but lack room for imagination.

Therefore, there is a gap in design research: making human-AI relationships in the near-future discussable. Experiences based on realistic speculation can provoke thought (Auger, 2013). These thoughts can guide discussions towards considerate technological developments. The initial design question for this final bachelor project was: "How might we create a design to provoke thought on social implications of human-AI relationships in the near future?"

Methods

To answer this question, a triple diamond design process (Chen, 2021) was followed. Among other methods, practices from discursive design and participatory design were applied. A futures cone, cocreation and cultural probes in particular. This way, a discursive and experiential prototype is reached that fits into the lives of participants.

Results

The result is Deary: a conversational AI that guides its users through Acceptance and Commitment Therapy (ACT). The product features three personality settings varying in agreeableness, enabled with a simple interaction. This setting influences the use of language and the pitch and pace of speech of the conversational agent. Via a cultural probe, it has been shown that the personalization aspect of Deary provokes thoughts on the subject of human-AI relationships.

Contribution

This project provides:

1. Exploration of the design space of discursive design about near-future human-AI relationships.
2. An artefact that provides realistic thought in the discussion about the social impact of near-future AI developments.

Discussion

The project has limitations in diversity of the population sample. Design decisions could have been made more thoughtfully. The intention of the product needs to be reconsidered to choose methods for further works.

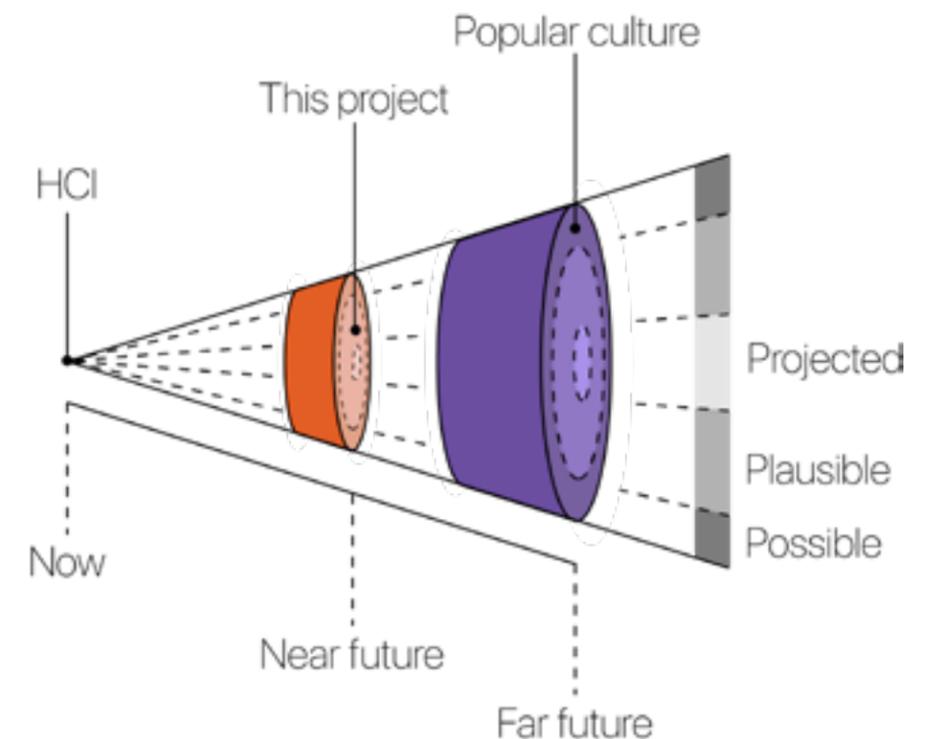


Figure 3: A futures cone (Voros, 2003) demonstrating the research gap filled by this final bachelor project.

1. Theoretical Background

Borenstein and Arkin (2019), scholars on AI and ethics, demonstrate the need to constructively investigate the ethical and social implications of intimate human-AI relationships in the near future. One way of investigating is to design speculative futures to provoke thought and discussion (Auger, 2013).

Popular culture

Speculations about the future of AI are abundant in popular culture. These works portray the field of AI and robotics as "a kind of sublime spectacle of inevitability that does little to offer lay citizens the sense that they can be actively involved in shaping its future." (Goode, 2018). This causes irrational fear on the one hand (Liang & Lee, 2017) and a religion-like belief in the developments of technology on the other (VPRO, 2020).

For a more realistic image, a distinction needs to be made between general AI and narrow AI. Narrow AI "is trained to perform one task well, but cannot adapt and generalize beyond that", while general AI is "a hypothetical machine that can understand and learn any intellectual task a human being can." (Notter et al., 2021) In other words, while current technology enables AI to excel in specific tasks, even the possibility of a general AI is up for debate (Boucher, 2019).

Design practice and HCI

Design practice and academia on human-computer interaction (HCI) have procured several guidelines for designing AI in the present.

Starting with design practice, Justin Baker (2019), posed that designers should →treat AI as a capability for specific applications. E.g. to use an AI trained for visual purposes to add an augmented reality function to a product. Josh Lovejoy (2018), UX manager at Google, exemplified the importance of making AI-enabled products trustworthy and ensuring human control.

In HCI, an extensive literature analysis by Abdul et al. (2018) reinforced the importance for trust, transparency and explainability to empower users with AI. Secondly, an analysis of AI-enabled consumer products by Amershi et al. (2019) produced 18 guidelines for human-centered AI design. Many of these guidelines revolve around putting the user in control. Lastly, Yang et al. (2019) exemplified the importance of designing AI unremarkably to support rather than replace human decision making.

The European Commission (2021) has created seven requirements for trustworthy AI. Similarly to the discussed findings, these are: human oversight and agency; technical robustness and safety; privacy and data governance; transparency; diversity, non-discrimination and fairness; societal and environmental well-being; and accountability.

Conclusion

Popular culture on AI to provoke thought causes magical thinking about future technological advancements. Design practice and the field of HCI provide clear guidelines to design human-centered AI, which is reflected in requirements from the European Commission.

The theoretical background shows the unrealistic yet thought-provoking far-future scenarios provided by popular culture on the one hand and the clear present-focused yet unimagined proceedings in design practice and academia on the other. Between the two, there is a gap to fill for a near-future, probable and experienceable design artefact that challenges the relationship between humans and AI.

2. Orientation

Process

To reach a thought-provoking end product, an iterative design process was followed: Zendesk's triple diamond process (Chen, 2021). Zendesk's process is based on the double diamond design process (UK Design Council, 2019). It renaming the stages to "Problem Discovery; Problem Definition; Solution Discovery; and Concept Validation". Furthermore, a third diamond was added to develop the design for rollout (see figure 4). This project followed the process until and including concept validation (see figure 5).

Applied methodologies

Firstly, practices of critical design were applied. My project had a similar goal to critical design: opposing the typical 'affirmative design' (Tharp & Tharp, 2015). Whereas critical design is often focused on the far future to produce a very provocative design (Gonsler, n.d.), my project is focused on the near future, to provide an alternative experience within the here and now.

Secondly, Experience prototyping was used as a technique, as it makes people "gain first-hand appreciation of existing or future conditions through active engagement with prototypes." (Buchenau & Suri, 2000)

Lastly, participatory design practices were used. Participatory design views participants as subject matter experts, providing an understanding of how designs fit in their lives holistically (Elizavora & Dowd, 2017). This was beneficial to my project, as the design question explores social relations between my product and users. The application of this practice meant that all user research was done with the same population sample.

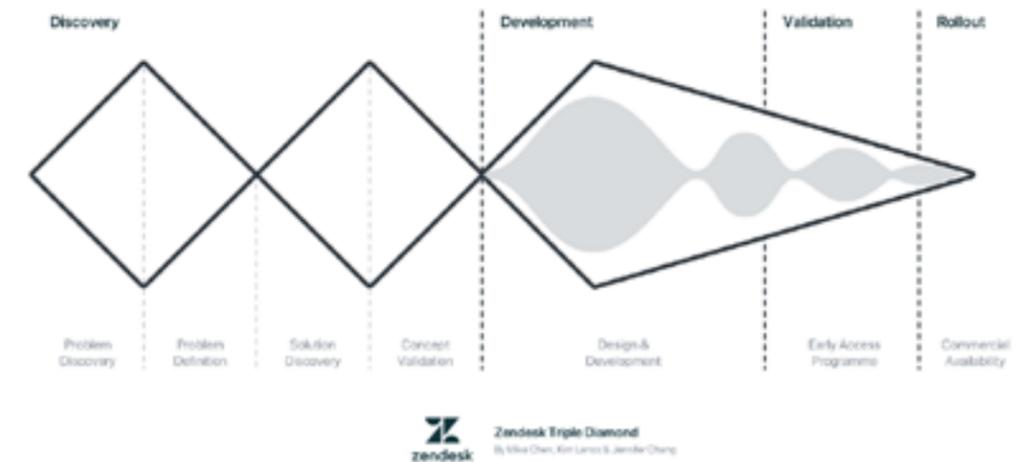


Figure 4: the Zendesk Triple Diamond design process (Chen, 2021).

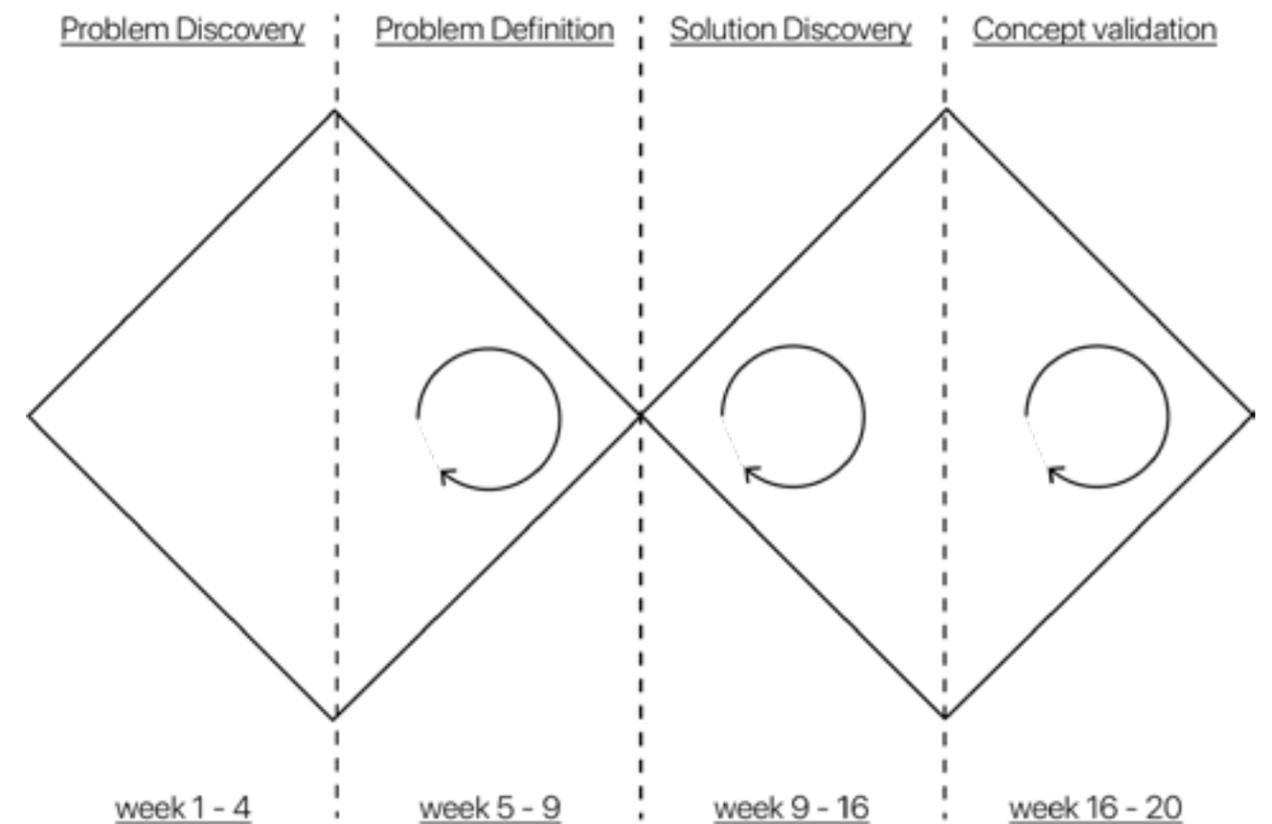


Figure 5: a graphical representation of the design process of Deary. The symbols inside the diamonds symbolize iterations on the prototype.

3. Related Works

Many works exist that speculate relationships between humans and robots/ AI. The following is a selection of work that inspired my project.

Art and popular culture

Her (Ellison et al, 2013) is a film about a man falling into a romantic relationship with an operating system (OS) with conversational user interface (CUI). When the OS mentions she is in love with hundreds of people, they dramatically break up. Ultimately, the experience makes the protagonist appreciate human to human interaction more.

Robots in Captivity (Buitenplaats Doornburgh, 2021) was an exhibition that explored the relationship between humans and technology. Human- or animal-like personalities were attributed to robots, imagining how they would live in our biosystem. Examples include "The Mad King", an aggressive assembly robot that is locked up to prevent harm to humans.

Robot Love (Robot Love, 2018) was an exhibition about possible technological advancements towards intimate human-robot relationships. It interactively explored the border of what is uniquely human and what can be shared with computers. Examples include sex robots and a humanoid robot clone to prevent loneliness.



Figure 6: Still from Her (Ellison et al, 2013).



Figure 7: The poster of Robot Love (Robot Love, 2018).

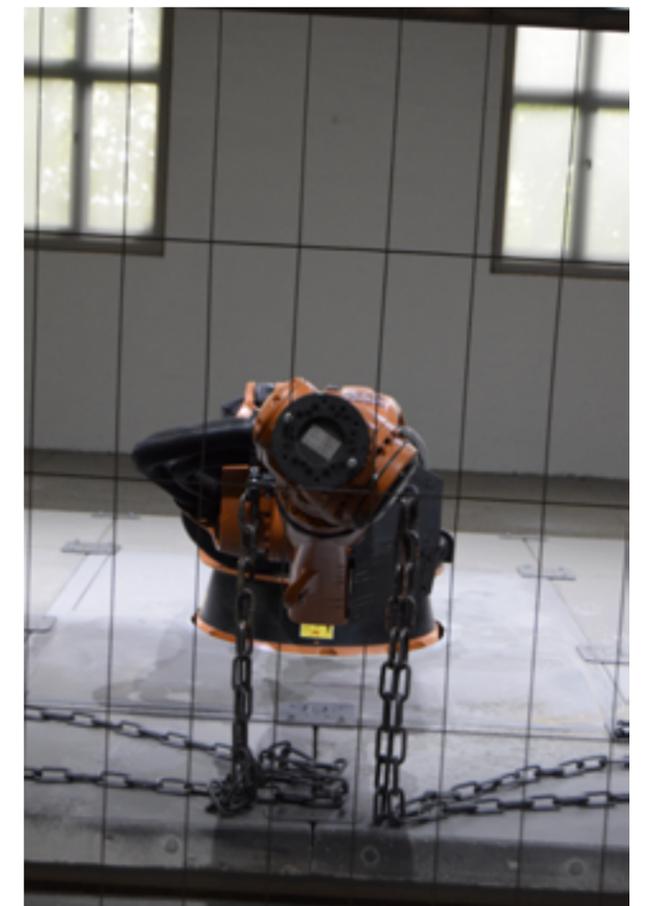


Figure 8: "The Mad King", a robot featured in robots in captivity.

3. Related Works

Academic work

Parviainen & Søndergaard (2020) used research through design to explore experiential qualities of whispering to a voice assistant. Through a cultural probe study, this way of interacting with our products was shown to evoke values of creepiness, intimacy and trust. A short film that portrays a use scenario was made based on the findings.

Our friends Electric (Rogers et al., 2019) presents a set of three speculative voice-enabled smart assistants. Through short films, their use and social role are shown. First, Eddi is a voice assistant that grows with the user from scratch. Whereas Eddi's nescience is infuriating at first, its later thorough understanding of the user proves useful. Next, Karma is a voice assistant whose personality can be tuned on six axis. This allows for automatic talk, even with extreme moods. Lastly, Sig is a programmable smart speaker. Sig can be tuned exactly to the user's wishes. However, it ends up selling things to the user, revealing its intended purpose.

The relation to my project

The related works range from near-future to far-future and from plausible to impossible. What is missing in these speculative works, is a way to experience the speculation in the user's own environment. My work provides subtle shift in relationships between humans and computers. My aim was to make an experiential prototype that can be developed in the near future, which novelty can guide realistic speculation.

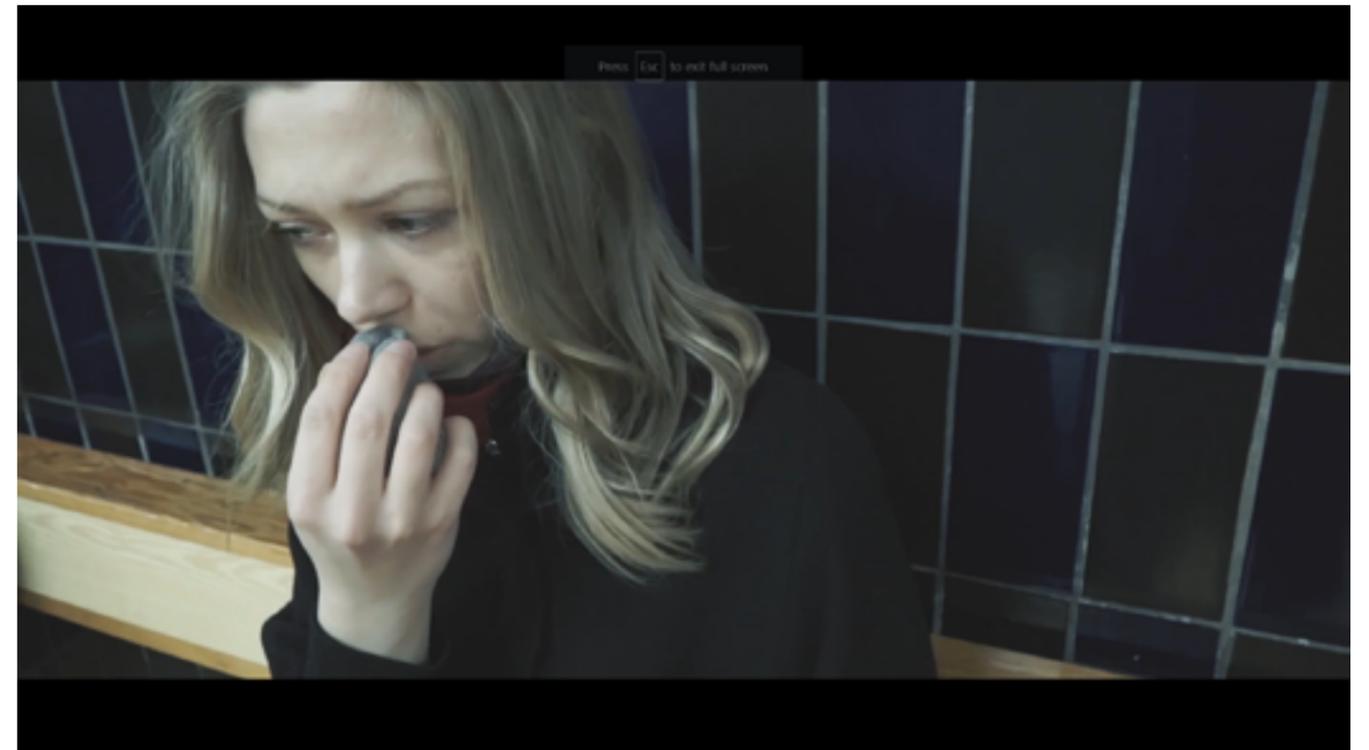


Figure 9: Still from *One*, the short film of Parviainen & Søndergaard (2020).



Figure 10: The three smart assistants from *Our Friends Electric* (Rogers et al., 2019). From left to right: Karma, Eddi and Sig.

C. Process

The sidebars on coming pages display which part of the process is discussed and which expertise areas were implemented.

1. Problem Discovery

The process began with the initial design question: "How might we create a design that lets people reimagine the human-AI relationship in the near future?" To narrow this question down, the project needed a way to make a personal bond with AI experienceable.

The questions answered in this phase are:

1. What type of AI can best be applied for social use?
2. What social aspect is missing in current AI?
3. What general issue can be addressed with the product to make it applicable in people's lives?

1.1 AI type for social use

Method:

literary research

Results:

The article by Baker (2019) was used to choose an application of AI. The interactive category featured direct human-AI interaction, while other categories featured more back-end applications. Also, most related works feature a conversational AI, so that application was already associated with speculation. For this reason, conversational AI was chosen as the application of AI for this project.

1.2 Missing social aspect

Method:

Literary research

Results:

For the social aspect, personality was chosen. Conversational agents nowadays are mostly used as helpful assistants in customer service (Völkel et al., 2020; Gnewuch et al., 2017). This narrow range of applications causes little diversity in the personalities of conversational agents.

To describe personality, MBTI or the Big Five Personality model could be used. The Big Five Personality model is the most widely accepted model to describe personality. It describes personality in five dimensions subdivided in multiple facets (see table 1 on page 11; Lim, 2020; NEO Facets Table, n.d.). MBTI measures personality on four binary traits (see table 2 on page 11). These traits result in 16 unique four-letter combinations to describe personality (Boyle, 1995). The personalities resulting from MBTI are easily distinguishable, but the binary limitation makes it much less informative than the Big Five Personality model (Celli & Lepri, 2018). Thus, the Big Five Personality model was chosen.

Conscientiousness or agreeableness could be used as the variable personality dimension for the product. Common present conversational AI's are modeled for customer satisfaction. Conscientiousness and agreeableness yield the highest customer satisfaction (Castillo, 2017). Völkel et al. (2020) investigated dimensions to describe personality in current conversational agents and found that agreeableness plays a key role in most of them.

US

MDC

10



US

Traits	Neuroticism	Extraversion	Oppenness to experience	Agreeableness	Conscientiousness
Facets	Anxiety	Warmth	Fantasy	Trust	Competence
	Angry Hostility	Gregariousness	Aesthetics	Straightforwardness	Order
	Depression	Assertiveness	Feelings	Altruism	Dutifulness
	Self-consciousness	Activity	Actions	Compliance	Achievement Striving
	Impulsiveness	Excitement-Seeking	Ideas	Modesty	Self-Discipline
	Vulnerability	Positive Emotions	Values	Tender-mindedness	Deliberation

Table 1 - Traits and facets of the Big Five Personality model (NEO Facets Table, n.d.).

Are you outwardly or inwardly focused?	How do you prefer to take in information?	How do you prefer to make decisions?	How do you prefer to have your outer life?
Extraversion (E)	Sensing (S)	Thinking (T)	Judging (J)
Introversion (I)	Intuition (N)	Feeling (F)	Perceiving (P)

Table 2 - The four traits of MBTI (Boyle, 1995). The questions are based on a Wikipedia infographic (Beech, 2022).

1.2 Missing social aspect

Furthermore, I speculated that taking away conscientiousness would result in a less immersive user experience as the conversational agent would do less. A not working conversational agent would be perceived as non-functional, as a flawed design. A disagreeable agent, on the other hand, would provide a novel user experience by having the product intentionally be unfriendly. For this reason, agreeableness was chosen.

To fit the variable personality setting into an interaction, it was decided to let the user choose the conversational AI's personality. The influence of personality choice on use of language based on the facets of agreeableness is shown in table 3.

Conclusion

personality was chosen as a social aspect to add to my product. The user would be able to change the agreeableness of the conversational agent, as described by the Big Five Personalities model.

	Agreeable	Neutral	Disagreeable
Trust	<i>Trusting</i>	<i>Helpful and objective</i>	<i>Cynical</i>
Straightforwardness	<i>Honest and direct in explanation</i>	<i>Concise explanation</i>	<i>Undirect in explanation, Manipulative</i>
Altruism	<i>Concerned towards the user</i>	<i>Task-oriented</i>	<i>Focused on itself.</i>
Compliance	<i>Helpful</i>	<i>Task-oriented</i>	<i>Aggressive</i>
Modesty	<i>Focused on the user</i>	<i>Task-oriented</i>	<i>Narcissistic</i>
Tender-mindedness	<i>Allowing of emotions of user</i>	<i>Easy-going but not focused on emotion</i>	<i>Tough-minded; disregarding emotions of the user.</i>

Table 3 - Implications of agreeableness setting on user interaction, inspired by the wikipedia page on agreeableness (Wikipedia contributors, 2021).

1.3 General issue to address

Method:

A poster (figure 11) was spread through Stratum to recruit participants locally. This poster featured a questionnaire (appendix A) with, among other questions, a magic wand question (e.g. Wells & McCaig, 2016): "If I could magically change or add something to my life or environment, I would do this:". With the broad theme emergent from the magic wand question, a more defined direction was found through small talk.

Figure 11: the recruitment poster.



US

12



1.3 General issue to address

Results:

20 people responded to the questionnaire. Figure 12 shows a thematic analysis of the results from the magic wand question. One of the three most mentioned themes was social behaviour. As the direction of my project was about the social aspect of AI, Social Behaviour fitted the theme well. Sociality could be captured by letting the product help users in a personal manner.

By talking about to friends, a more defined purpose was found: helping with building a sleep rhythm by reducing screen time at night. The dutch mental health institute confirms that non-healthy sleep habits is a big problem within the Netherlands (Hersenstichting, 2020) . Evening exposure to LED screens, affect sleep and cognitive performance (Cajochen et al., 2011).

Conclusion

In this phase, the purpose of the product and the design question were narrowed down. The resulting design question is: "How might we design a conversational agent with different personalities in agreeableness to provoke thought on the social implications of human-AI relationships in the near future?" The practical use of the product was defined as building healthy sleeping rhythms.

Text	Theme	N
Beter klimaatbeleid :)	Systemic change	6
Woningen		
Voorkomen van fabeltjesfuik		
Oplossing voor de grootste ziektes		
Geld minder belangrijk maken		
Financieel onafhankelijk zijn	Climate	4
Beter klimaatbeleid :)		
Iets waardoor iedereen een beetje meer zijn/haar best zou doen om de wereld een mooiere (milieubewust en voor elkaar) plek te maken		
Rommel/vervuiling natuur en stad opruimen/blijven opruimen		
Ik zou m'n alles rondom mijn huis veranderen van stad naar natuur	Social Behaviour	4
Iets waardoor iedereen een beetje meer zijn/haar best zou doen om de wereld een mooiere (milieubewust en voor elkaar) plek te maken		
Meer begrip en liefde voor elkaar		
Begrip voor elkaar (en dat m'n huishouden zichzelf draait, schoon en opruimen)		
Iemand/iets die mij altijd een goede dag wenst en complimentjes geeft	Household automation	3
Begrip voor elkaar (en dat m'n huishouden zichzelf draait, schoon en opruimen)		
Een robot huishoudster toevoegen (zoals AX400 in detroit become human)		
Vloerverwarming in mijn huis	Superpowers	3
Kunnen vliegen of transporteren zou cool zijn		
Teleportatie		
Mijn brein uploaden naar een computer	Medical Technology	2
Oplossing voor de grootste ziektes		
Medische hulpmiddelen om duidelijker te identificeren waar mijn gezondheidsproblemen zitten	Efficiency	1
Iets om efficiënter mijn werk te kunnen doen		
Extreem veel feesten	Partying	1

Figure 12: Thematic analysis magic wand question.

2. Problem Definition

After finding a more defined direction, a prototype needed to be made that expressed a changeable personality on agreeableness. This prototype needed to help build healthy sleep rhythms. The prototype needed to be validated by users as well as an expert.

2.1 Prototyping

Method:

The physical design was first lo-fi prototyped and then transferred into a 3D print. The conversational part was programmed for a wizard-of-oz scenario.

Results:

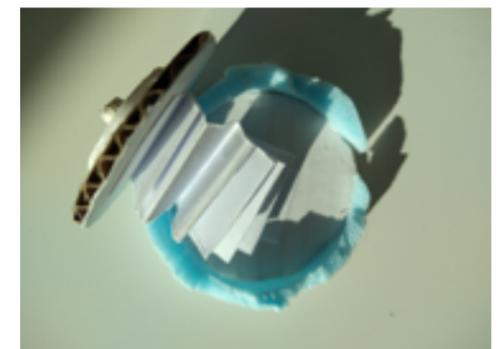
Through lo-fi prototyping (figures 13 - 18), a rotating or sliding interaction to change agreeableness was found to feel natural. The prototype of figure 18 featured a shape that resembled a smiley. It was used to define a higher fidelity prototype (process: figures 19 & 20). The final 3D printed prototype can be seen on figure 21.

The product was envisioned to measure the users' sleeping rhythm for two weeks. After these two weeks, the product would wake up and urge the user to sleep on a schedule based on its data. This was inspired by Hershner & Shaik (2020), who showed the importance of a consistent rhythm for good sleep. The product featured five agreeableness settings that influenced how it talked. A controllable animation that can be viewed via [this link](#) (De Vries, 2022, February) including speech was made with Processing, to demonstrate the function of the product.

A translation of the speech in the animation can be found in appendix B, along with the code used to create the animation.



Left top: figure 13; a lo-fi prototype of a bracelet with personality slider.



Left bottom: figure 14 and Right bottom: figure 15; a lo-fi prototype of a turnable personality slider with a push button to start conversation.



Top left: figure 16 and Top right: figure 17; a lo-fi prototype with turning interaction and a slap to express unwanted behaviour.

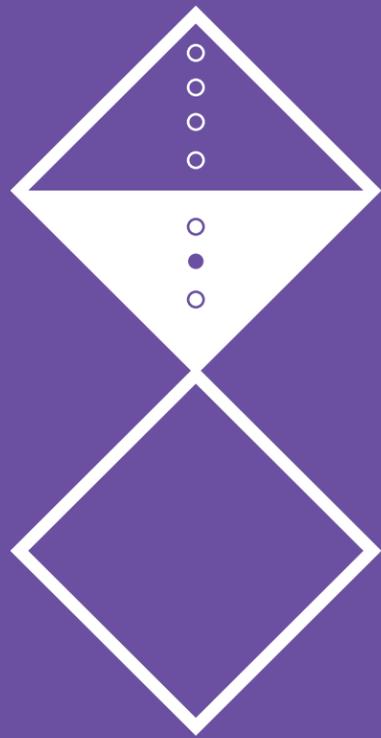


Left bottom: figure 18; a lo-fi prototype of rotating to set personality accurately. Shape resembles a smiley.

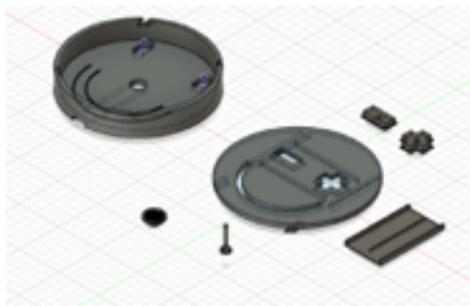
TR

CA

14



Left top: figure 19; Sketch and cardboard prototype. The prototype was tried and failed to be made into a sensor.



Left bottom: figure 20; 3D models.



Right bottom: figure 21; final prototype.

2.2 User testing

Method:

The sample group consisted of 6 participants (50% male, 50% female, all 16-30 y/o) The test was done in 3 groups, with 1, 2 and 3 participants. A user test was done to answer the questions: "How do people experience using the product?" and "Does the product make people think about the human-AI relationship?" Remarks from the pulmonologist interviewed in this phase (M, 31 – 45 y/o) are also included in the results.

Table 4 on page 16 shows the setup of this test.

Results:

The analyzed results from the product evaluation phase can be seen in table 5. Appendix C shows the full setup, results and thematic analysis of this user test.

How do people experience the product?

The product evaluation phase showed that the product was experienced positively.

The product was found to look good and its simplicity made it very usable.

Stage	Explanation
Experience	Participant experienced a simulated four-day use of the prototype in a lab setting (figure 21). This experience was guided by the animation with prerecorded speech. When participants answered outside of the capabilities of the pre-recorded speech, I answered as if I were the prototype.
Product evaluation	Participants were asked to describe their experiences with Microsoft product reaction cards (Benedek & Miner, 2001) , a geneva emotion wheel (Kujala et al., 2011) and a UX curve (Sacharin et al., 2012).
Interview	A semi-structured interview was performed to discuss the evaluations. After the interview, there was the possibility for unstructured discussion about the human-AI relationship.

Table 4 - The research setup of user test 1.

"You immediately see what you need to do when you see it." – pulmonologist

The learning behaviour of the product was experienced as personal. Whether it be through compliant thinking from the product in an agreeable setting or manipulative behaviour in a disagreeable setting, the participants were positive that the product would help with building a sleeping rhythm.

"It feels bad to constantly ask if you can have some more time out of bed. Because it is AI, it will learn about your laziness."- P4

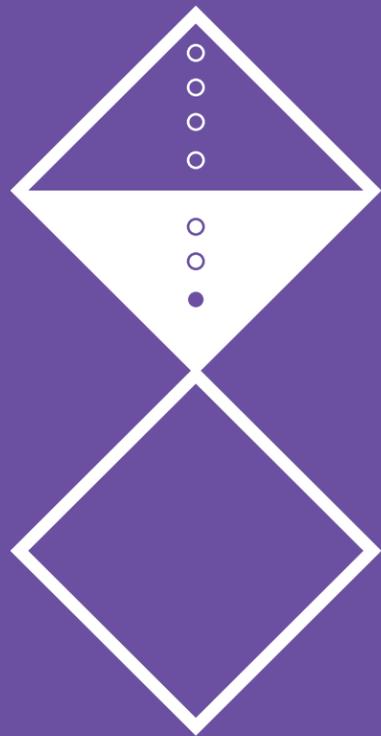
Does the product make people think about the human-AI relationship?

Although the product was experienced as personal, not much thoughts arose about future relationships between humans and AI .

"I am still quite neutral in the whole matter [of personal AI]" – P6.



Figure 21: the lab setting for user test 1. With a sleeping mat and sleeping bag, the room was transformed into a bedroom. The animation was projected on the wall.



Method	Results
Experience	<i>Most people changed the personality once or twice over the two days. There was not much conversation with the product. Mostly it was just one reaction to what the product said and the conversation mostly stayed within the realm of going to sleep or getting up.</i>
MS product reaction cards	<i>The reactions were mostly positive. The three top-rated cards, all with 2 people picking them, were friendly, fun, easy to use and simplistic.</i>
Geneva emotion wheel	<i>the mean response to positive emotions was 2 points higher than to negative emotions. The participants on average rated the negative emotions with no control higher than the emotions with control. For the positive emotions, no control was rated lower on average than emotions with control.</i>
UX Curve	<i>Most UX curves showed a line that rose from the beginning until the end, as expectations were medium at first but the experience turned out to be fun. Most participants expected the UX curve to stay high when using for a longer time.</i>

Table 5 - Analyzed results of the first user test.

2.3 How to improve sleep

Method:

A pulmonologist, i.e. lung doctor, from Veldhoven MMC was interviewed. The expert's expertise was lung-related sleep issues, but he also treated more general sleep issues. The interview was preceded with the wizard-of-oz experience of using the product, without the bed. The interview was semi-structured and featured questions about what factors influence sleep, to see how the product could help. Appendix D shows the set up of the interview alongside a transcription and thematic analysis.

Results:

The pulmonologist liked the concept and thought it had potential.

"It is good that it thinks with you about the sleeping times"

However, many factors outside of building a schedule were named to be important for healthy sleep.

"I think it is good to do more around the sleep. So it could give tips earlier on in the evening, for example in terms of sleeping hygiene and sleeping rhythm".

2.4 Evaluation of sleep as application

Related works on AI-guided help with healthy sleep based on side factors was inspected (e.g., Nguyen et al., 2020 & Liu et al., 2020). Based on this and the comments from the sleep expert, I decided to find another practical use for the product. The problem is dependent on many variables for the scope of this project and my contribution would be minute.

Conclusion

This phase saw the making of a first prototype. This prototype was tested positively on usability and user experience. However, it did not provoke much thought about the social implications of coming developments in AI. Improving sleep was proven to be too broad of a subject for this FBP. Another practical use of the product needed to be sought.

3. Solution Discovery

The project needed to be reframed towards a new practical use of the product. Research on this new use needed to be done to reach a new prototype. Next to that, research into associations with agreeableness could be done to base the physical form of the product on.

3.1 New use

Method:

Literary research focused on mental health issues was done, inspired by this comment from the pulmonologist: "[Psychology and cognitive behavioral therapy] are expensive and intensive treatments. Those can be tackled through things such as this."

Results:

Schoemaker et al. (2019) concluded that Dutch students increasingly experience performance pressure. The report recommended to increase resilience, to cope with 'normal' stressors. Resilience is defined as: "the ability to maintain or regain mental health, despite experiencing adversity" (Herrman et al, 2011). It combats negative feelings such as somberness and loneliness (Woudenberg et al., 2020), which have increased in Dutch students due to the COVID-19 epidemic (NOS, 2021).

Conclusion:

A new user group is defined as students struggling with negative feelings. The new use for the product is to conversationally increase resilience.

3.2 How to increase resilience?

Problem statement:

A method needed to be found to conversationally increase resilience through.

Method:

A semi-structured interview was done with two mental health practitioners (official Dutch title: POH-GGZ) Appendix E shows the set up of the interview and notes taken during the interview.

Results:

The way to increase resilience was described generally as "learning how to detect and handle stress and learning how to relax". Several therapeutic methods were mentioned, but the practitioners were convinced that Acceptance and Commitment Therapy (ACT) suited my project most. ACT was described to me as "about accepting feelings. Don't put them away. Living to your values."

No clear guidelines on building a conversation were reached, as the goal of a conversation in therapy "is different for everyone." The practitioners saw use in my tool as "an introduction to improve your resilience. If you don't dare talk to anyone about it, you might feel bad about that and a downward spiral gets made."

Conclusion:

ACT was chosen as the method to increase resilience. The product would be an introduction to increasing resilience.

3.3 What is ACT?

Problem statement:

I was introduced to ACT and now needed to find a speech protocol. First step: knowing what ACT is.

Method:

I followed an online module on ACT aimed at patients of POH-GGZ's, to experience ACT from a first-person perspective.

Results:

ACT is a form of cognitive behavior therapy that uses mindfulness and acceptance to achieve mental flexibility (i.e. resilience) (Hayes et al., 2006). The module explained the goal and methods of each step using metaphors. Acceptance is about being content in the here and now. Commitment is about finding what you find valuable in life and starting to live accordingly. Acceptance and commitment were divided up in six stages as shown in figure 23. A patient should eventually be able to go through the stages iteratively on their own.

3.4 Speech protocol for ACT

Problem statement:

I knew what ACT was, but not how a conversation could be built to talk users through it.

Method:

A speech protocol was found through roleplay. I played the device (without agreeableness setting) and tried to stick to a speech protocol. Another person played the user. The definition of a speech protocol took place in three stages:

1. Enacting the whole of ACT with one person. The device would explain what ACT was and give choice to the user on what part of ACT they wanted to do.
2. Enacting a defusion exercise with multiple peers on the semi-final demo day. The device explained what defusion was and took users through a meditative exercise of watching your thoughts as if they were leaves falling on a river.
3. Choosing another exercise and writing an initial protocol.

Results:

Stage 1

Stage 1 did not produce a fluent conversation. Firstly, Explaining all the stages of ACT was too much information for the user. Secondly, using words such as 'defusion', 'acceptance' and 'values' was intimidating to the user. An introductory round with questions like "how are you?" and an explanation of the product's function made the conversation start more smoothly.

Stage 2

In stage 2, a narrower use was chosen to model a conversation: a defusion exercise called "leaves on a stream" (Therapist Aid, 2021). Taking a healthy distance from thoughts is a calming activity that people would not do normally.

Stage 2 resulted in smoother conversations as the goal was better defined. However, the exercise did not ask for much verbal response from users and it ended ambiguously. This made users hesitant to start the conversation or quit halfway, and it complicated creating a speech protocol for the product.

Stage 3

For the final speech protocol, I chose another defusion exercise: "just noticing" (Rodriguez, 2020). The exercise features finding a non-helping thought, prepending it with "I notice I am having the thought of" and literally taking steps back. The exercise provides a clear conversation progression and asks the user to speak. The initial protocol that emerged is shown in figure 24.



Figure 23: the 6 stages of ACT.



Figure 24: the initial speech protocol.

3.5 Agreeableness expression in speech

Problem definition:

Next to the effect of agreeableness on use of language, the effect on pitch and speed of speech could be researched.

Methods:

Literary research

Results:

Polzehl (2015) mentions that a high speech-to-pause rate is perceived as agreeable: relatively fast and elaborate talk is perceived as agreeable. Jung et al (2018) and mcGehee (1944) show that male low-pitched voices are perceived as more agreeable than male high-pitch voices. Table 6 shows what implications agreeableness has on the speech of my product, based on my findings.

3.6 Modeling the speech protocol

Problem definition:

The speech protocol and implications of agreeableness needed to be programmed.

Method:

Dialogflow, Google's platform for creating conversational user interfaces (CUI's), was used to model the conversation.

Results:

Three conversational agents, for three personality settings, all follow the initial protocol (figure 24). The Dialogflow agents use contexts to follow the conversation progression. Through fallback intents, the agents respond to unforeseen user responses by rephrasing what user input the product is looking for. Additionally, the user can always quit the conversation.

You can talk to the agents online in Dutch via [this link](#) (De Vries, 2022). The following pages show figure 25: the conversational flow of the product (Deary) as a decision tree. Appendix F shows the picture again alongside screenshots of the Dialogflow console.

Agreeableness	Use of language	Speed and pitch of voice
Agreeable	<i>Relatively long sentences, reacting to user input, a bit of non-cynical humor.</i>	<i>Fast and low</i>
Neutral	<i>Humanly kind, to the point, acknowledges user input</i>	<i>In the middle</i>
Disagreeable	<i>Small sentences that do not clearly explain the intentions of the product. Ignores user inputs or makes cynical remarks,</i>	<i>Slow and high</i>

Table 6 - Influence of agreeableness on use of language and speed and pitch of voice.

TR

MDC

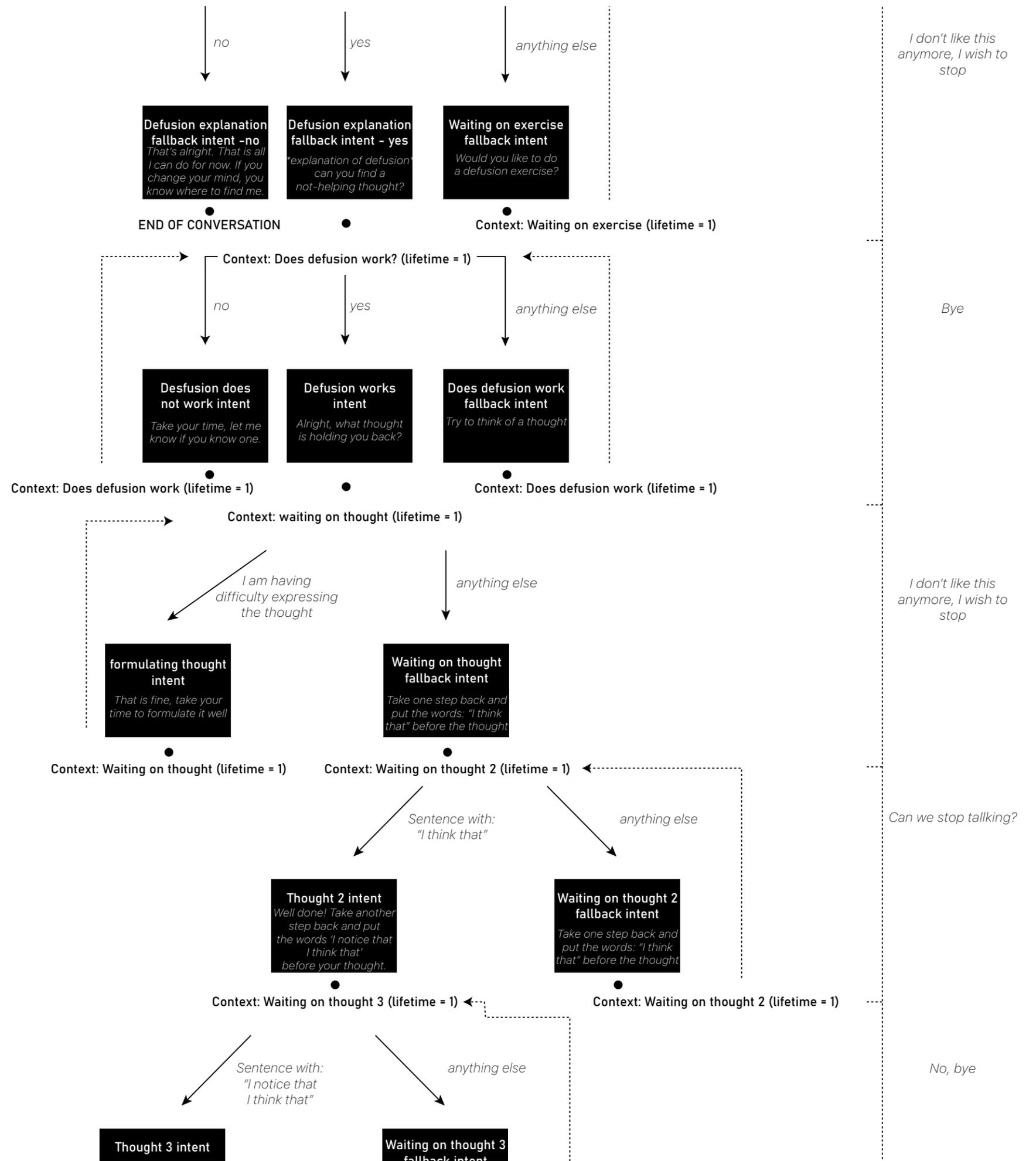
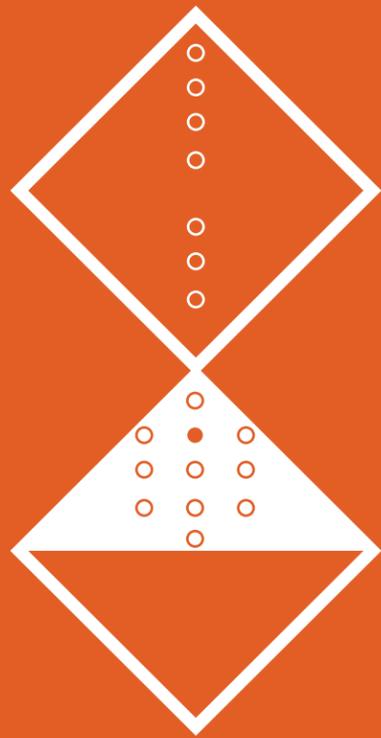
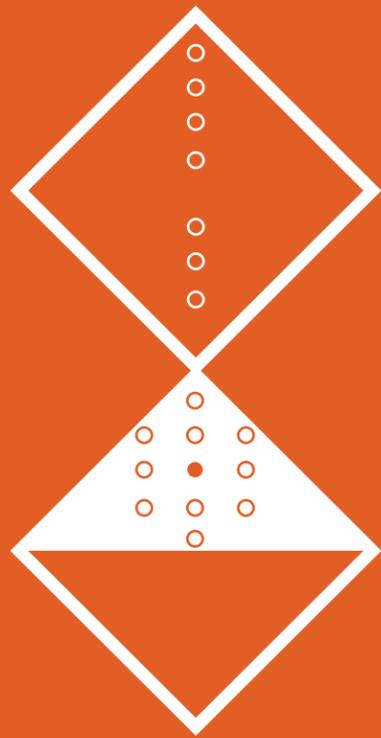


Figure 25: the speech protocol of Deary.



US

CA

22

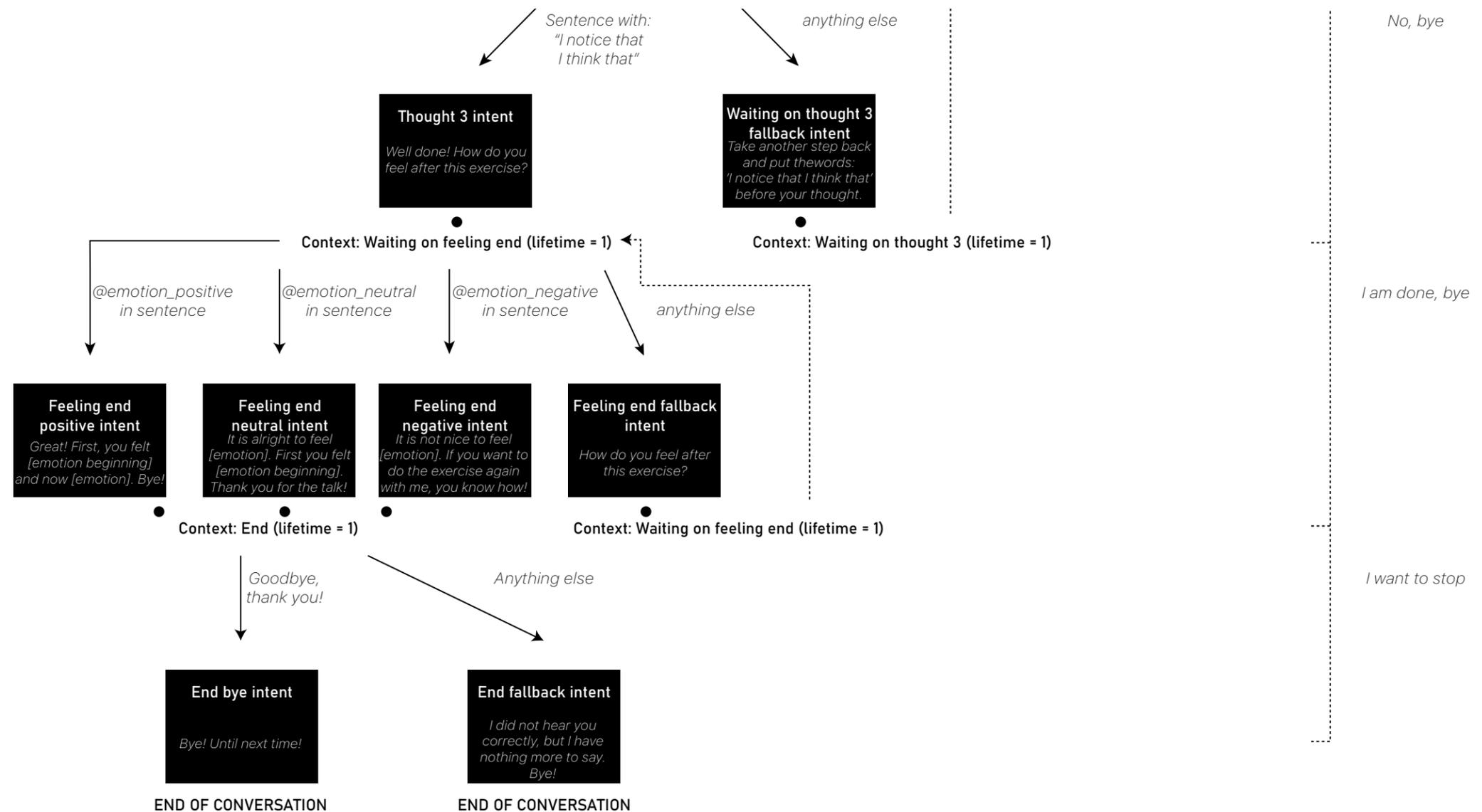


Figure 25: the speech protocol of Deary.

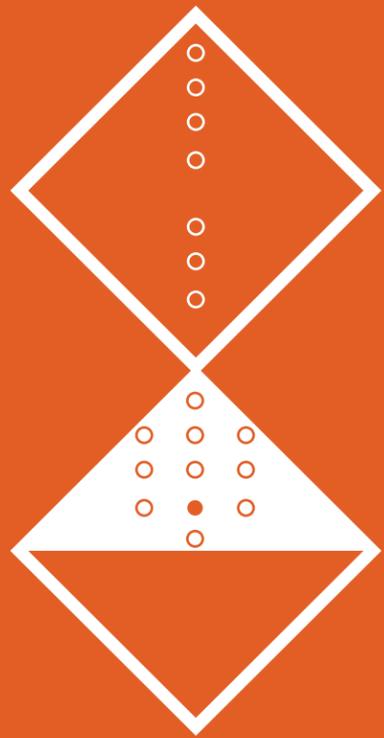
3.7 Associations with agreeableness

Problem definition:

The look and feel of the previous prototype were based on personal associations with agreeableness. To reach a more informed physical prototype, it could be researched how participants associated materials, shapes and interactions with agreeableness, disagreeableness and therapy.

Method:

A cocreation session (IDEO, n.d.) was done with four participants (75% male, 25% female, all 16-30 y/o). The participants were first asked to collaboratively order 12 wooden shapes on a scale from agreeable – disagreeable. These shapes varied in combinations of three dimensions: pointiness, regularity and number of sides. Then, the participants were asked to do the same with 11 materials with various textures. Thirdly, the participants were asked to craft lo-fi prototypes of an interactive product individually. Lastly, lo-fi prototypes were created collaboratively in a 3-6-5 method (Woudenberger et al., n.d.) fashion.



Results:

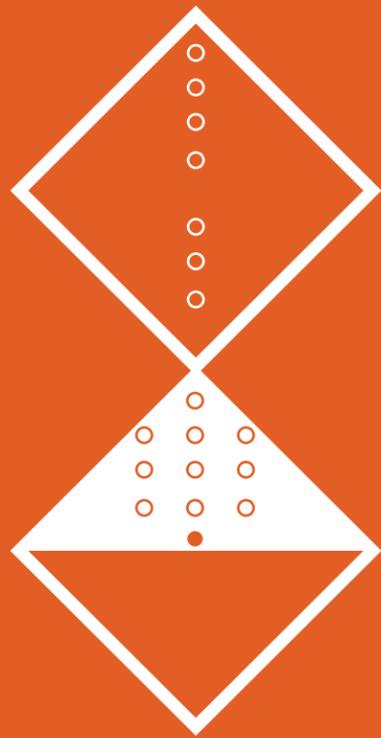
figure 26 shows the ranking of the materials and shapes on a scale from disagreeableness – agreeableness. Table 7 (page 24) shows an analysis of properties associated with with the three agreeableness settings.

Figures 27 and 28 feature individually created lo-fi prototypes. Figures 29 and 30 feature collaboratively created prototypes. All prototypes can be seen in appendix G. Common themes of the prototypes were: shape change, material expression, allowing for exploration of textures and turn to set agreeableness.

Agreeableness (1 = disagreeable, 13 = agreeable)	Shape	Material
1		
2		
3		
4		
5		
6		

7		
8		
9		
10		
11		
12		

Figure 26: Ranking of materials and shapes from disagreeable - agreeable.



	Agreeable	Disagreeable	Remarks
Shapes	<i>Irregular, non-pointy shapes with many sides</i>	<i>Irregular, pointy shapes with little sides</i>	<i>Regular shapes were ranked between neutral and disagreeable.</i>
Materials	<i>soft materials and materials with a medium - small but distinct structure</i>	<i>materials with an unpleasant texture (e.g. plant pot associated with a school board) or with a low heat capacity</i>	

Table 7 - Associations of agreeableness on material and shape properties.



Figure 27 (left) and figure 28 (right): lo-fi prototypes made individually by the participants.

The prototype in figure 27 allowed users to put explore the material both on the inside and on the outside of the prototype. The textures were envisioned to be calming while talking about personal matters.

The prototype in figure 28 could be pushed in smoothly because of a spring. It was envisioned to be placed down anywhere, so the user can walk around when talking.

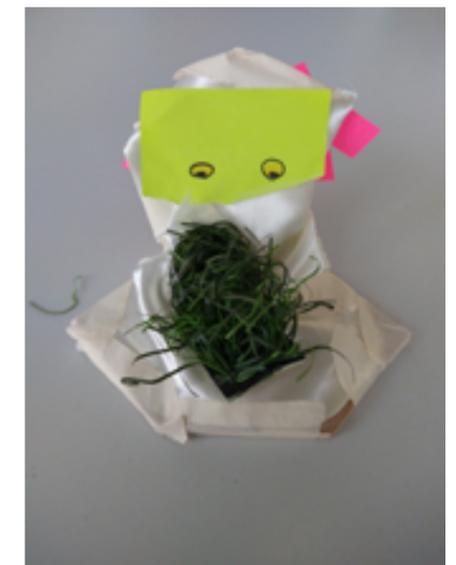
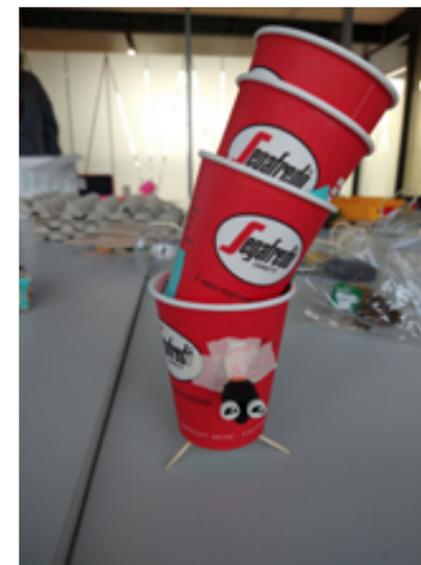
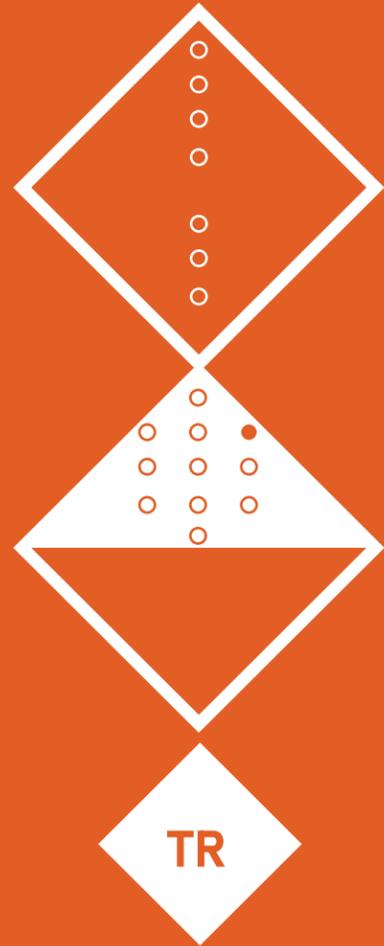


Figure 29 (left) and figure 30 (right): lo-fi prototypes made collaboratively by the participants.

The prototype in figure 29 would walk around. It could be whispered into when expanding the cups. The eyes could be turned to show happiness or anger, showing the agreeableness.

The prototype in figure 30 would open up like a clam to allow conversation. The fake grass, a disagreeable material, represents its personality setting. It could be pulled out or retracted



3.8 Physical prototyping

Problem statement:

A new physical prototype needed to be made to accompany the new use of the product.

Method:

The new prototype took inspiration from the results of the cocreation session.

Results:

A shape-changing interaction was envisioned, sketched (figure 31 & figure 32), lo-fi prototyped (figures 33 and 34) and translated into a 3D model (figure 35). The 3D printed parts that the user interacted with were used to create a mould cast plaster (figure 36). The shape-change was inspired by the shapes explored in the cocreation session. Having the product change shape according to associations of agreeableness – disagreeableness would make for an associatively intuitive interaction. The materials of the product associatively showed the agreeable - disagreeable dualism, based on findings of the cocreation session: the casing was made of a textured fabric, and the bottom and top were made of plaster to resemble the feel of the plant pot.

Because there were issues creating the mechanics, the end product (figure 37) did not look as expected and it did not feature shape change. The electronic part of the prototype was programmed on a raspberry pi (see figure 38 and appendix H for wiring and the code used). To allow for some more functional feedforward of the personality setting, an RGB LED and servo indicated the option that was selected, as shown on figure 39.

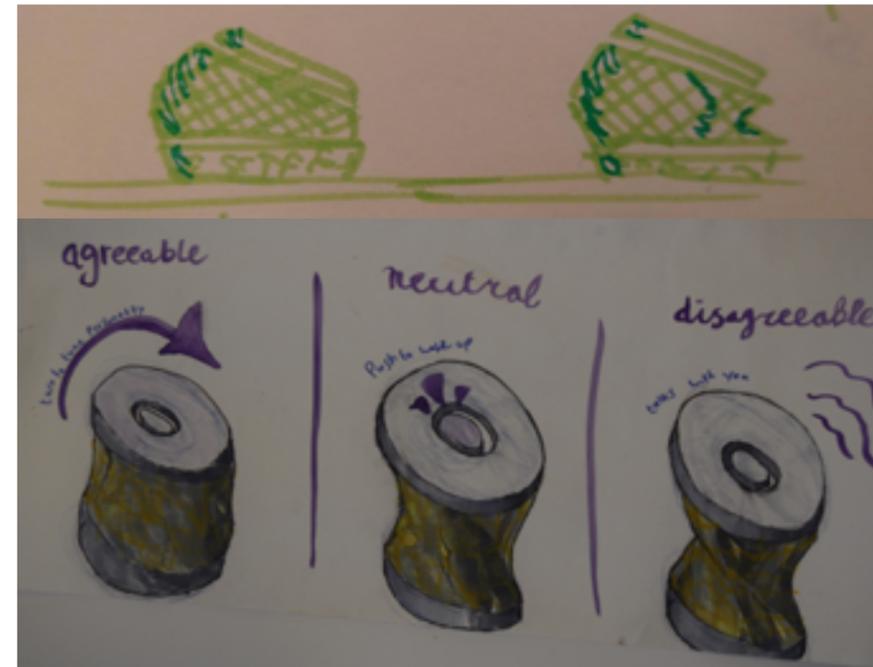


Figure 31 (top left) and figure 32 (bottom left): sketches for the new prototype.



Upper row right; figure 33: an aperture made to explore shape-changing interaction.

Upper row left: figure 34: prototype for mechanical exploration
Middle: figure 35: 3D model
Bottom: figure 36: 3D printed parts and alginate moulds.

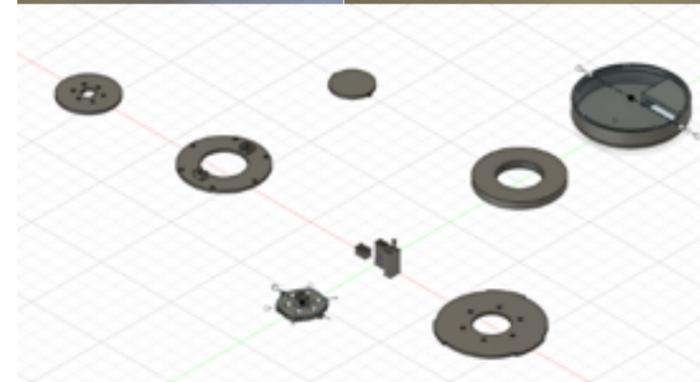


figure 37 (below): the semi-final prototype.



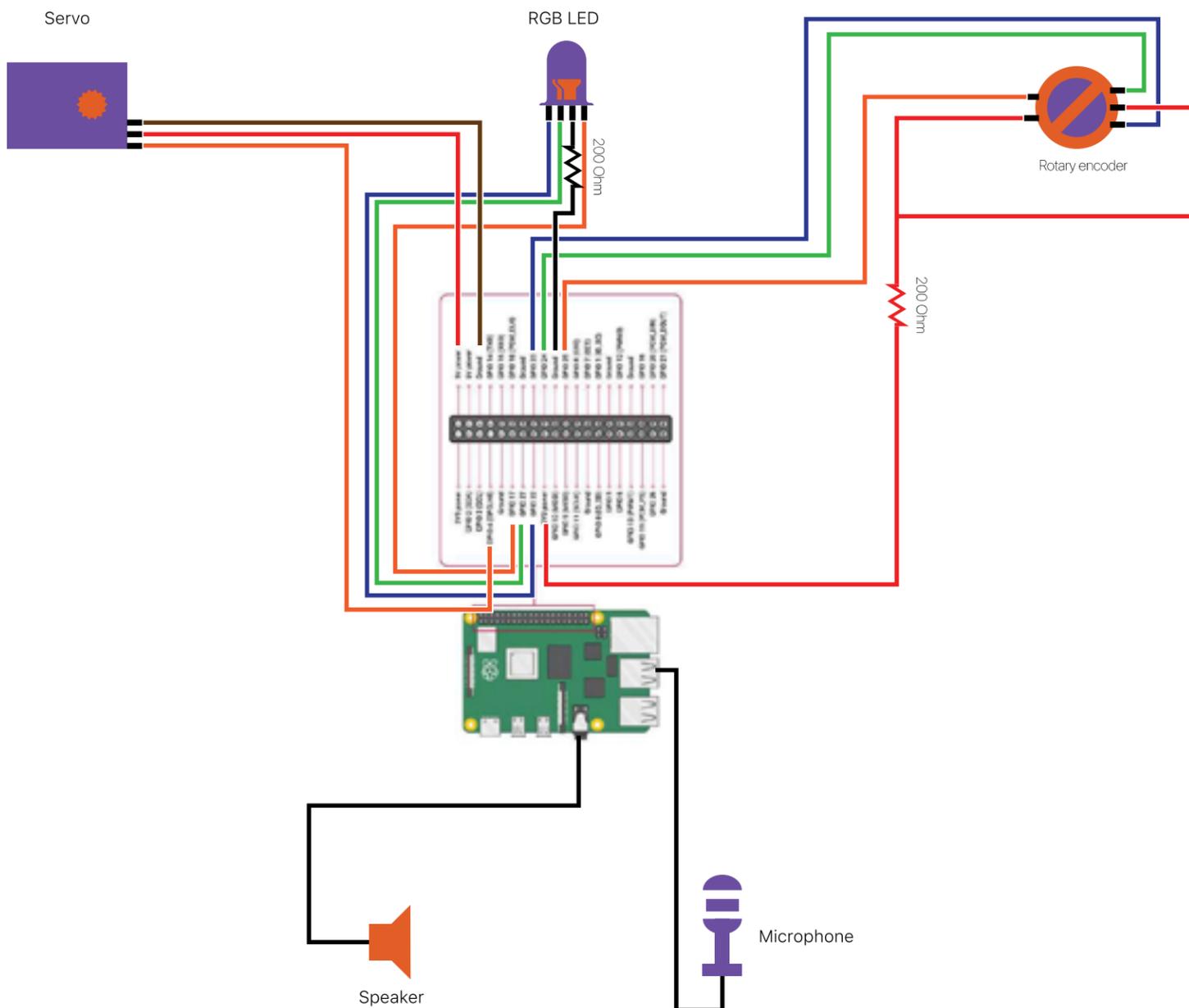
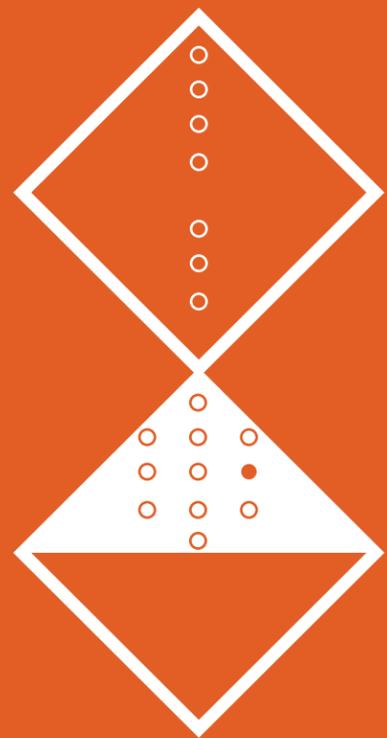


Figure 38: wiring of the new prototype.

Disagreeable

Neutral

Agreeable

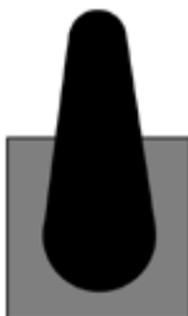
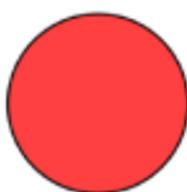


Figure 39: augmented feedforward of personality setting by RGB LED and servo.

MDC

26



Conclusion

This stage saw the reframing of the project to a new purpose. The reframing led to a new prototype and a programmed conversation. The new prototype conversationally leads users through a defusion exercise, which is part of Acceptance and Commitment Therapy (ACT). The prototype allows for the selection between an agreeable, neutral and disagreeable conversational agent through a physical embodiment whose materials reflect the agreeableness – disagreeableness dualism.

4. Concept Validation

The new prototype needed to be tested to see if it provokes thought on the social implications of near-future AI products. Next to that, improvements could be made to the prototype to better reflect the results gathered throughout the process.

4.1 Test prototype

Method:

A cultural probe study (Celikoglu et al., 2017) was done with one participant (male, 16-30 y/o). The cultural probe featured the latest prototype and a booklet with instructions and questions (figure 40; appendix I). The participant was asked to use the product once a day for four days. Day 1, the product was set to agreeable. Day 2, it was set to neutral. Day 3, it was set to disagreeable. Day 4, the participant could choose the personality setting. The questions for each day were: "How pleasant was the conversation?", "Will your day be valuable? Why?" and "Make a drawing of what best symbolizes your day".

The questions were meant to gather information on usability as well as to create involvement in using the product. After the four days, an unstructured interview was held to answer the questions: "How was the product experienced?", "What influence does personality aspect of the product have on user experience and ethical implications?" and "Does using Deary let users reimagine the human-AI relationship in the near future?" The last question was answered not only with the answers in the interview but also with the user involvement and duration of the interview.

To measure whether the product increases resilience, a validated questionnaire was used (RS-NL; appendix J; retrieved from Turan, 2013). The questionnaire features 25 questions answered on a 5-point Likert scale, where a high score represents a high level of resilience, except for one negative question. By taking the mean of the answers before and after the cultural probe, the influence of the probe on resilience could be tested. It was hypothesized that the resilience after the test would be greater than before the test.

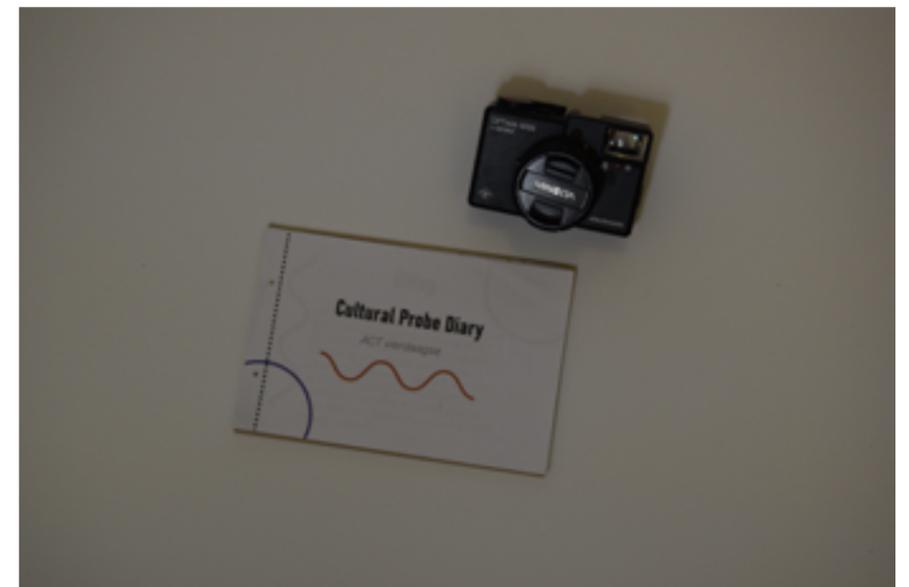
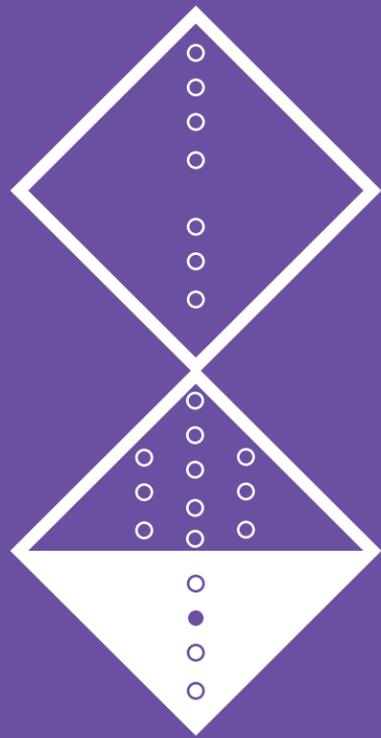


Figure 40: The cultural probe Diary.

US



Results:

Appendix K shows a transcription of this interview alongside a thematic analysis (in combination with the final evaluation)

How was the product experienced?

The product took some getting used to and there were a few technical difficulties.

"Deary couldn't hear me well. I needed to reiterate everything a few times."

However, The product was experienced as something new and fun. The conversation was humanlike and the content was good.

"I liked it, it was new for me. ... It felt more like an actual conversation than with other conversational AI tools."

There was a transparency issue.

"Because I could decide [the personality] myself, it felt like I was in control. But it still was some leap afterwards: you don't know how the conversation was going to go. I did trust, however, that Deary would guide me well."

Influence of personality aspect on UX and ethical implications

The use and personality settings of the product provided a human-like interaction. The participant even mirrored the personality of the product.

"because Deary was disagreeable, I wanted to be disagreeable myself too and said no to the assignment. I expected that Deary would do it anyway, but he just said 'bye' and was gone (haha)"

The disagreeable setting made the participant feel like he needed to "initiate and guide the conversation" and the agreeable setting was found to be "a bit too patronizing". In the end, neutral provided the best user experience:

"my favorite one was neutral. It was the nicest"

Reimagining human-Ai relationships in the future

The conversation lasted 42 minutes and 42 seconds, which was 12 minutes longer than expected. the participant was engaged as he enthusiastically answered the questions and even brought up a point of discussion about whether he would want to buy the product without being asked.

When asked, the participant imagined he could form an emotional bond with Deary on a longer use basis.

"I think [if I used Deary for a longer time,] I would compare it to an adult version of a teddy bear. You form this emotional bond of which you feel that it is reciprocal, but deep down you know that it is not real".

When asked if humanness in AI is beneficial, he brought up a point for ethical discussion.

"Where is the divide between humans and AI? Should we break it? AI is useful, but shouldn't feel like a human conversation. That would not be true"

Resilience

There was a slight drop in resilience, but it was smaller than the standard deviation. The product has no significant impact on resilience. (figure 42).

Conclusion:

The product offered a novel experience that could be used as a basis to reimagine human-AI relations. However, there were transparency and usability issues.

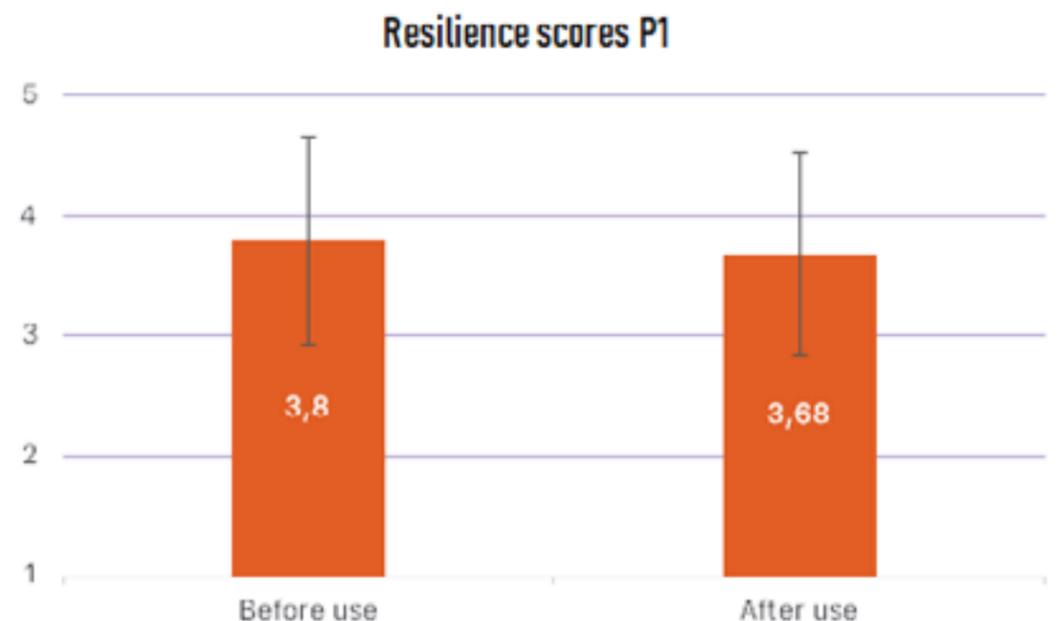
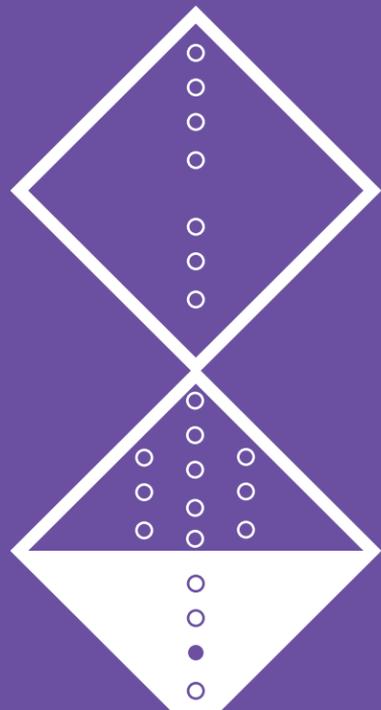


Figure 41: The mean of the answers of the participant to RS-NL before and after the test.



TR

MDC

CA

30

4.2 New prototype

Problem statement:

Although the general question of this project was answered with the last prototype, the physical form could be improved to reflect the previously gathered outcomes. Next to that, the transparency issue could be resolved.

Method:

The prototype was inspired by the first user test, the cocreation session and the cultural probe. To resolve the trust issue, a user manual booklet was made that explains how to use the product and how it deals with data.

Results:

The prototype can be seen on figure 42. The interface resembles the prototype made in phase two, as the simplicity and associative values of the smiley created a good user experience. Because the interface already gives functional feedforward to the personality setting, a servo was no longer needed. However, LED lights still show the personality setting. The new wiring and code can be seen on figure 43 and appendix L. The shape and materials drew inspiration from the cocreation session. A diamond was shown to be a neutral shape. The materials reflect the agreeable – disagreeable dualism, with a textured fabric on top and chalk paint on the bottom, resembling the feel of the plant pot material. The booklet can be seen in figure 44 and appendix K.

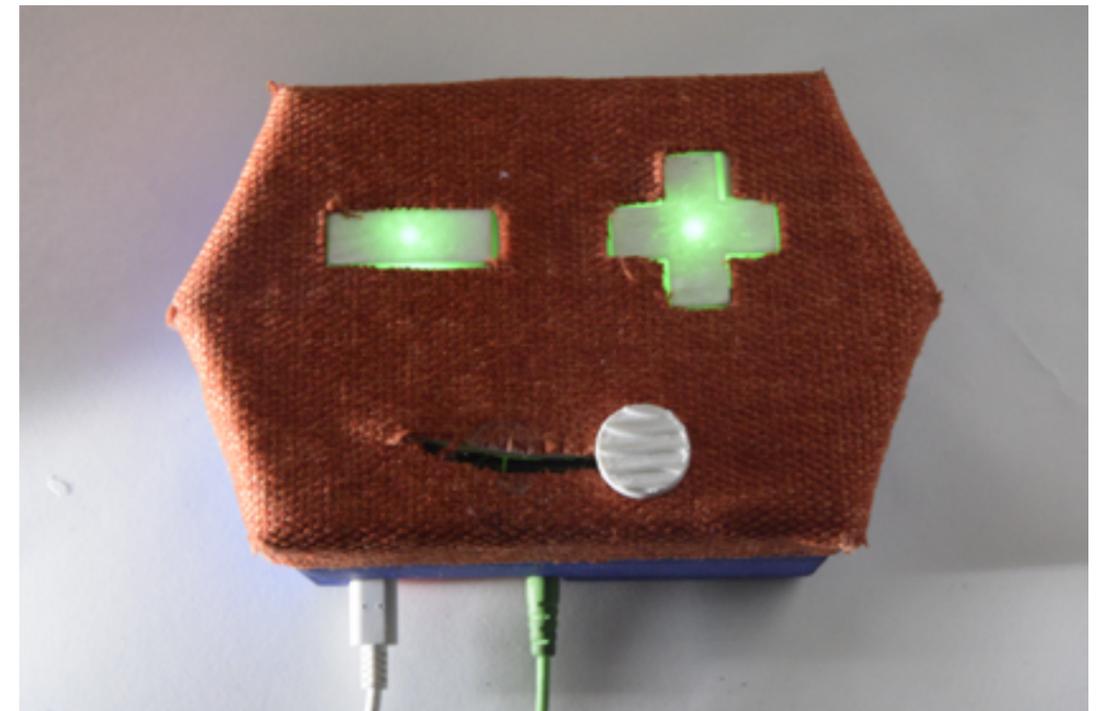


Figure 42: The final prototype of this project.

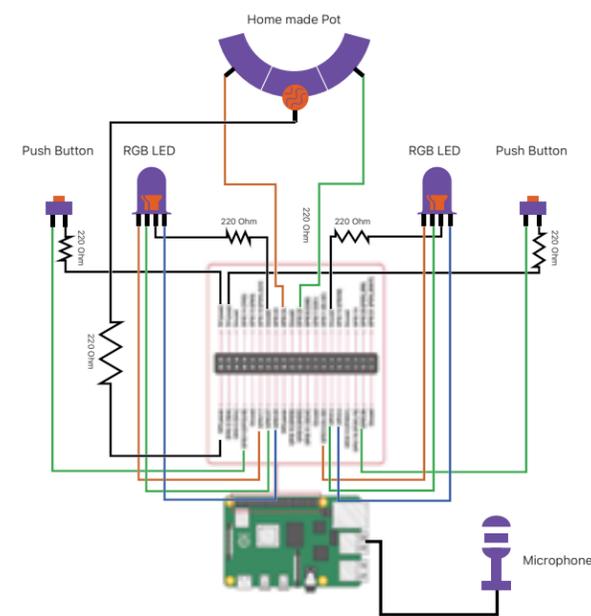


Figure 43 (Left): Wiring of the final prototype.



Deary
User Manual

This is the back side. Please flip me over.

How to use

1. Plug in power and audio
2. Push to wake Deary up
3. Slide to select agreeableness
4. Push again to confirm
5. Say something like "ho!" Start the conversation (in Dutch)

What it does

Deary talks you through Acceptance and Commitment Therapy (ACT). This is a form of cognitive behavioral therapy that encourages people to embrace thoughts and feelings, rather than fighting them or feeling guilty for them.

One part of ACT is cognitive defusion. Cognitive defusion involves creating space between yourself and your thoughts and feelings so that they have less of a hold over you. In this way it helps to cope with uncomfortable or unhelpful thoughts.

Deary conversationally leads you through one defusion exercise, in which you are asked to find an unhelpful thought and to step away from it, literally creating distance.

How your data is used

Why this text is here

The product and the development team of Deary follow the European Commission's guidelines for ethical AI. This page aims to give you transparency on the use of your data and how the AI in Deary works. Aside from sticking to regulations, we also provide you with this information to improve your user experience. After all, trusting a product increases your enjoyment.

How Deary gathers your data

Deary only registers your voice inputs and the use of the physical sensors. It records your voice and interprets it to match a voice output (intent). The latest voice input is stored exclusively on the physical device. The use of physical sensors is not stored and is only used to control Deary at the moment of interaction.

The device does store your voice inputs online, even when a conversation is not totally completed. This data is stored alongside the time and date of the input and Deary's response.

The process of interpreting voice input is called Natural Language Processing (NLP).

Why Deary exists

Deary is a near-future, probable critical design. It is a product that can be developed within mere years. It aims to offer a user experience that differs from the functional use that AI currently (2022) is generally used for. By using AI for a very personal purpose and with the option to customize, it aims to make the user think about our near-future relationship with AI, as AI gets more incorporated in our society.

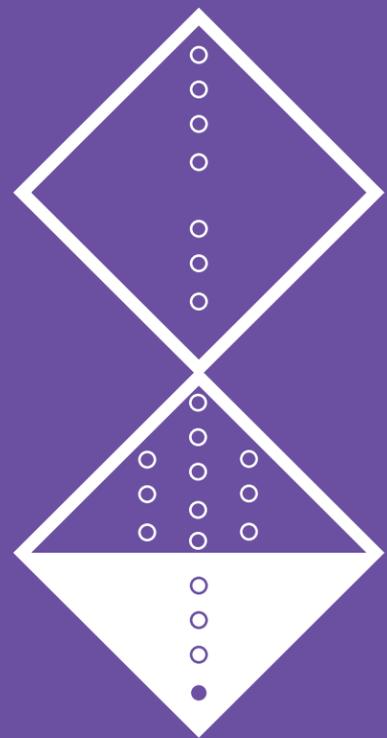
How Deary uses your data

The only AI aspect of Deary is NLP and intent matching, i.e. interpreting your voice inputs and matching it to an output. Or put simply: having a conversation.

The conversations with Deary will not change over time. Deary does not 'get to know' you. However, you will see that Deary can understand some words and will use those words to create unique sentences.

The data stored online is stored on the personal Google account of the researcher. The data thereby is exclusively available to the researcher, the researcher's university coach and Google. The online data is not used automatically for any purpose.

Figure 44 (Below): The user manual. Pages are rotated for readability.



4.3 Final test

Problem statement:

The user experience, influence of personality and thought-provokingness of the new prototype needed to be evaluated.

Method:

A cultural probe study was done with another participant (male, 16 – 30 y/o). The method of this test are the same as the cultural probe done earlier in this phase. The cultural probe booklet changed slightly without affecting the content. The interview questions were also altered (see appendix K).

Results:

The interview lasted 33 minutes and 22 seconds, which is 3 minutes and 22 seconds longer than expected. The participant seemed mediocrely engaged, as he responded to questions normally and provided elaborate answers.

The new physical form of the prototype was received positively.

"[Deary] looks nice. I liked how it came in a little compact box with some texture and I was interested."; "it is nice that [Deary] had a smiley face on it. That already hints to that you have a friendly conversation with it."

The changeable personality was experienced as empowering.

"I think it is a really interesting concept that you are physically able to change it with an easy, rudimentary switch thing. It gives you some sort of power over the computer, which might be really good because after all it is a computer and there are a lot of thoughts about 'AI is going to take over the world' and stuff"

The changeable personality also made for an interesting experience and a certain switch of roles.

"The jabbing [made the conversation interesting]. It was kind of making fun of you, instead of you just making fun, like 'haha, dumb computer'."

Roles of social AI in the future were reimagined.

"what I would hope is to get an AI that is a bit more personal to you. Maybe it would have some random personality when you first get it, or it could grow with you."

Lastly, there were more technical difficulties, creating a bad user experience

"I stepped back and then it just said again "take a step back". So in the end I was up against the wall"

There was no significant impact on resilience from the use of the product (figure 46).

Further findings will be discussed in the evaluation section of this report.

Conclusion

The prototype from phase 3 was tested. Based on test results, a new prototype was made. This prototype features the intuitive interaction of the prototype tested with user test 1 and uses material and shape expression to show the agreeableness-disagreeableness dualism. This prototype was tested as well. The prototype and evaluation will be discussed in more detail in the following sections.



Figure 45: The mean of the answers of the participant to RS-NL before and after the test.

D. Results

1. Final Design

1.1 In short

The final product of this project is Deary, shown on figure 46. Deary is a conversational AI that guides students through a defusion exercise, in which they have to step away from a non-helping thought. This exercise from Acceptance and Commitment Therapy (ACT) is meant to increase resilience. The conversational agent can have three personalities on a scale from agreeable – disagreeable. The personality of the conversational agent can be chosen by the user. The physical embodiment of the product associatively represents the social use and agreeable – disagreeable dualism. Deary also features a user manual that creates transparency by explaining how the product works and how it uses user data.

1.2 Design question

The initial design question “How might we create a design to provoke thought on the social implications of human-AI relationships in the near future?”.

The application of AI was chosen to be a conversational agent (CA), as it provides a direct human – machine interaction. Personality was chosen as a changeable factor within the design, because personality varies very little within current CA’s. Conscientiousness and agreeableness are the two character traits most commonly attributed to CA’s. Between the two, agreeableness was chosen as the variable. It was presumed that a less agreeable CA would provide a novel, interesting experience while a less conscientious CA would be experienced as faulty.

The resulting design question that this project answers is: “How might we design a conversational agent with different personalities in agreeableness to provoke thought on the social implications of human-AI relationships in the near future?”.

1.3 Design description

The use case of ACT provides a relevant social use that allowed for experiential prototyping. Deary is plug-and-play: users only need to connect power and a sound cable to start using the product. The physical product’s top-view portrays a diamond, a neutral shape. The physical interface resembles a smiley, to associatively show the social use and the ability to set its personality. The 3D printed product is coated with a textured fabric and chalk paint, to highlight the agreeable-disagreeable dualism.

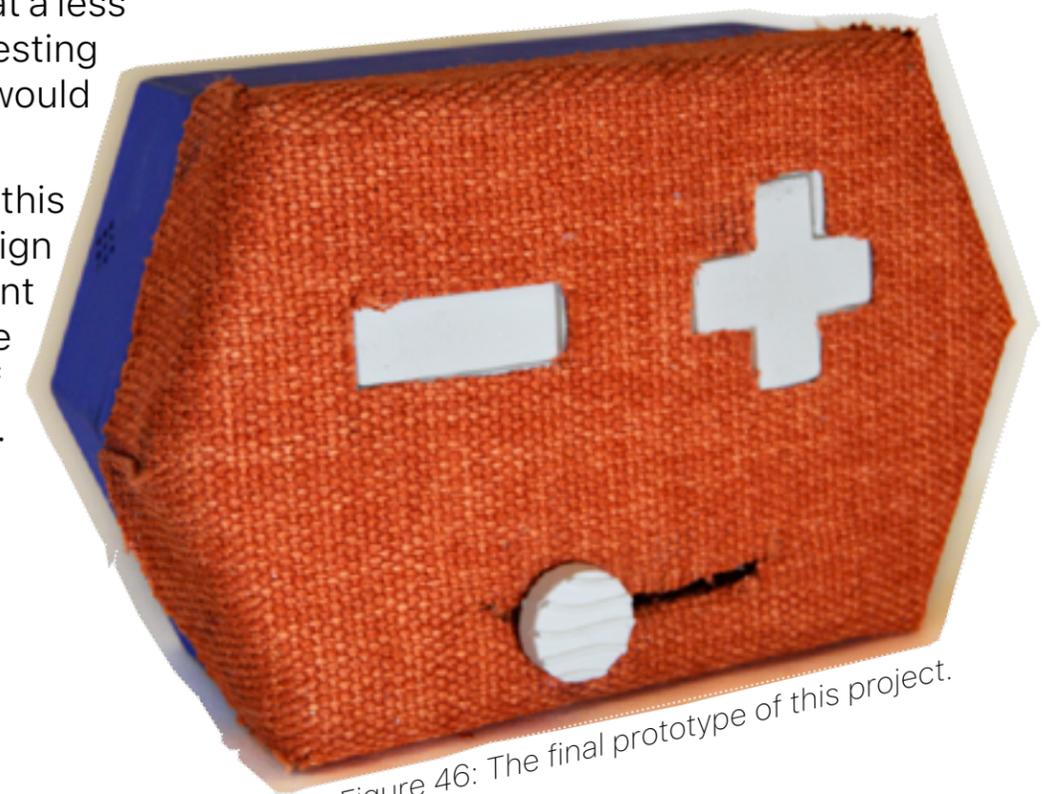


Figure 46: The final prototype of this project.

1. Final Design

1.4 Conversation design

Deary's exercise lets users literally step away from a non-helping thought. The overall conversational flow is shown in figure 47. The three personality types (agreeable, neutral and disagreeable) are represented by three Dialogflow agents that all follow the same conversational flow. The agents differ from each other in use of language, pitch of voice and speed of speech (see table 8).

As an example of the changeable use of language, imagine a user saying that they are feeling happy when asked by Deary at the beginning of the conversation. The agreeable agent would say "Good to hear that you feel happy! What are you going to do today?", while the neutral agent would say "Happy, alright. What are you going to do today?" and the disagreeable agent would say "And I guess you have a busy day today?".

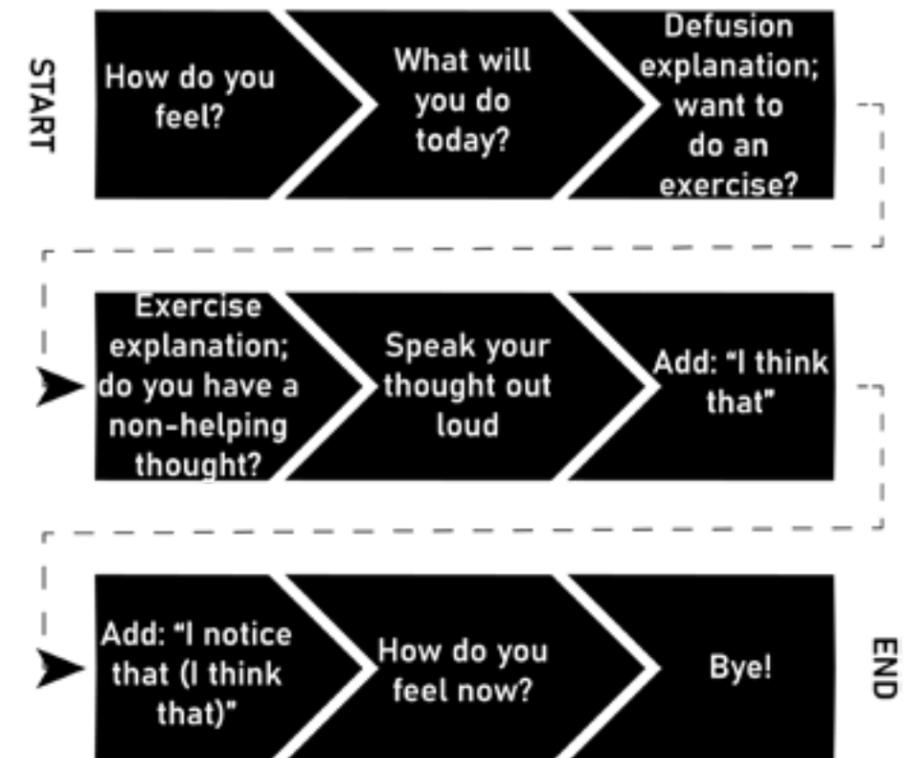


Figure 47: The conversation flow of Deary.

Agreeableness	Use of language	Speed and pitch of voice
Agreeable	<i>Relatively long sentences, reacting to user input, a bit of non-cynical humor.</i>	<i>Fast and low</i>
Neutral	<i>Humanly kind, to the point, acknowledges user input</i>	<i>In the middle</i>
Disagreeable	<i>Small sentences that do not clearly explain the intentions of the product. Ignores user inputs or makes cynical remarks,</i>	<i>Slow and high</i>

Table 8 - Influence of agreeableness on use of language and speed and pitch of voice.

2. Evaluation

Introduction

The final conversational user interface was evaluated two times with a cultural probe. The second test featured the final physical form.

Usability

The look and feel of the final physical product were experienced as pleasant and provided functional feedback.

"it is nice that [Deary] had a smiley face on it. That already hints to that you have a friendly conversation with it." – P2

However, the product had issues with hearing the user, partially because it was not clear when to speak to the device. The content of the conversation was experienced as pleasant and human-like, because of the conversational goal.

"Within its niche, [Deary] is better in terms of conversation [than Siri or Google Mini]" – P1

A user manual was created to fix transparency issues. The booklet cleared up the use, functionality and data use of the device.

"[The user manual] told me how to start up the device. That is the main thing. For the rest not that much. Maybe that I took it out of the power also because I knew it had a microphone and a connection to the cloud. But [it had] not too much [influence on my user experience], I think." – P2

How was changing personality experienced?

The disagreeable setting resulted in a novel and fun user experience that caused a switch of the typical human-computer role. The neutral setting was found most pleasant to use. The agreeable version felt a bit too patronizing. The social aspect of personality was found to increase humanness and engagement.

"Social aspect gives humanness, which causes engagement" – P1

Influence on resilience

The product had no significant impact on the user's resilience.

Does the product make users think about the social implications of human-AI relationships in the near future?

Yes. Both participants could envision how products like Deary could form a relation with its user in the future. Using the product served as a good basis to start a conversation on social use of AI in the future.

"I think [if I used Deary for a longer time,] I would compare it to an adult version of a teddy bear. You form this emotional bond of which you feel that it is reciprocal, but deep down you know that it is not real" – P1

"[A world where personal AI guides people would be] not that much different. I think people might have a short talk when they go to bed or when they wake up, something like that." – P2

Thoughts were generated on how products like Deary can fulfill social functions in current-day society.

"I think [therapy with a robot] as a supplement, it can be. Or as a first thing. But it shouldn't mean that human therapy would disappear. Or should" – P2

Speculations about learning or changing behaviour were also done.

"I think it is very human to change and to grow during your life. ... Maybe [if Deary changes its personality automatically, it] would use a certain type of language or some words that it likes to use." – P2

Lastly, limitations of current AI were considered. This shows that Deary puts speculation about AI in a realistic context

"[Deary] can't have any own initiative, as that is really hard to program. If you were to program freedom, you would need to program an infinite amount of rigid options." – P1

Conclusion

Deary could be used intuitively but featured issues in hearing, partially because the functional feedback of the product was unclear. The varying personality settings created feelings of humanness and novelty. Deary was not shown to increase resilience in its users. The use of the product was shown to provoke realistic thought on coming developments in social AI.

3. Discussion

Although an answer to the design question is given through the process of making Deary, there are some flaws and possibilities for future works.

Limitations

The final cultural probe tests were done with design students from the TU/e who were familiar with my project. Next to that, the method of an unstructured interview gave me the opportunity to guide the discussion. Therefore, the evaluation does not demonstrate that the use of the product provokes thought on the subject of human-AI relationships on its own. Next to that, it does not reflect how the product would be experienced by people unfamiliar to the product and proceedings in AI.

The recruitment poster of phase one was spread to provide a broad, local population sample. Nevertheless, the respondents that participated in user tests were mostly design students of the TU/e aged of 16-30. Only three participants followed another study. These three all participated in the user test of phase 2. One of these participants, who followed another study at TU/e participated in the cocreation session of phase 3. Different, more generalizable, results might have occurred if the population sample was more diverse and bigger.

During the process of finding and designing a use case for the end product, the design question and therewith goal of the project was disregarded. If the design question was followed more closely, a design that more effectively provokes thought

on the social implications of future human-Ai relationships might be reached.

What I would do differently if I restarted the project

The subject of ethics of AI was something I was unfamiliar with at the beginning of the project. Nevertheless, a direction was chosen fairly quickly. This resulted in performing design activities without a clear goal. In a next design project with a large and ambiguous theme, I will allow myself more time to define a clear design challenge and theoretical background to guide me.

Next to this, I noticed that the pace of an individual design project is much slower than a team project. This caused me to get a sense of haste and to perform many design activities. Not everything I did was directly useful to the project (e.g. an interview with a student in AI, shown in appendix N). Furthermore, it resulted in taking design decisions based on hasty interpretations of results. In a next individual project, I will allow myself more time to review results and to formulate new design activities. This will result in a project that is focused on quality rather than quantity of design activities.

To reach a more thought-provoking design, the product could have been designed more radically. For example, the agreeable version could have stayed completely silent because it does not care at all about the user while the agreeable version could have shown self-deprecating altruism or signs of toxic positivity.

Future works

To continue work on Deary, first the use and target group of the device needs to be more clearly defined. Will it be a commercial product for personal use with the added benefit of letting people rethink our relationship to technology? Or will it be a tool that can be used by researchers to inspire future developments in AI? The product as it is now can be developed usefully in both ways, with different design and production implications.

The cultural probe studies point out that it is desirable to make the product change over time, either by making it learn from the input of users or by letting it develop its own personality individually. This would make for a more interesting user experience, possibly leading to more valuable insights. To create this, similar work like Ahmad et al. (2020) can offer inspiration.

Usability issues occurred in the final test. The conversation was "a bit robotic" and "not thorough-going" and the physical product provided unclear feedforward and feedback resulting in difficulties being understood. The conversational protocol can be adapted to have more diverse conversations based on the user input and it can be expanded to feature more of ACT. The physical product and booklet can be adapted to provide clearer feedforward and feedback and to allow the product to hear the user better

If the product would be developed to provide users with therapy, expert opinions should be gathered to make the product effective. User feedback could be gathered to guide development as well. This could be done by launching the product as a minimum viable product.

4. Recommendations

For those who try to do the same as me

If you want to make the ethics and social implications of coming AI developments discussable by offering a realistic experience with social AI

Or if you want to do a project on ethics and AI in general

I can recommend a few things based on my experience in this project.

1. Define clearly what you want to discuss.

What I wrote down in the introduction was in my head from the beginning of the project to the end. But I did not clearly write down what I wanted to discuss and why. This made me forget what I even was working on when I needed to redefine my project.

Define the aspect of AI you want to discuss (e.g. unrealistic image portrayed by pop culture) and what you want to do with it (e.g. criticize / offer an alternative) and how you are going to do that (e.g. creating a social AI that makes having a human-like relationship with technology experienceable).

I have the feeling that even in this report, there is unclarity about what exactly I have done and for what purpose. This could have been avoided.

2. Stay on target.

You will encounter difficulty explaining that your design has a practical layer (e.g. therapy) and a critical layer (e.g. making social AI experienceable for thought). This critical layer will also be more difficult to explain.

This difficulty of explaining made me doubt whether the critical layer was good enough to sufficiently finish my project. It made me put the practical use above the critical in presentations. That weakened my design.

Know that your goal is to provoke thought and not to satisfy. This brings me to:

3. Dare to be critical.

The more outside of the ordinary your design is, the more thought-provoking it will be. This will also make it easier to explain your design. It's show don't tell: people will get it if you show it.

This is where my design and project lacks. Because I did not dare to go beyond human-centered design, my design puts function over thought.

5. Conclusion

This project provides an answer to the question: "How might we design a conversational agent with different personalities in agreeableness to provoke thought on the social implications of human-AI relationships in the near future?"

The answer comes in the form of Deary. Deary is a conversational user interface with a physical embodiment. The product's practical use is to guide students through Acceptance and Commitment Therapy to increase their resilience. The product empowers users to choose the personality of the product in three settings: agreeable, neutral or disagreeable. The personality setting influences the use of language and speed and pitch of the speech. The physical embodiment associatively represents the agreeableness – disagreeableness dualism and the social use of the product.

Through two interviews, it is shown that the product was perceived as human-like and that it provided a novel experience. The experience of using the product allowed for informed speculation on the social use of near-future AI products. These speculations can be used to discuss the near future of social AI. With these discussions, future developments in AI can be guided with attention to ethical and social implications

6. Personal Growth

6.1 Growth in PIV

This project showed that I am very interested in the intersection of technology, sociology and psychology. It showed me that I want to use design to give agency to people, to enable people to find value in things that feel sublime. The practical use of Deary as a therapy bot and the critical use of Deary as a basis for imagination on social AI both are a good example of what I find important as a designer: human-centered design aimed at finding value in your own situation.

The things I learned during this project made me a designer competent in all expertise areas, with User and Society (US) and Creativity and Aesthetics (CA) as focus areas (see figure 50). The fields of Technology and Realization (TR) and Math, Data and Computing (MDC) needed extra attention, which was given through this project. Competencies gained in US and CA allow me to research and prototype personal associative values. Competencies gained in TR and MDC allow me to realize designs guided by these values.

All goals described in this section of the report can be found in my PDP (appendix O), alongside my professional identity and vision and explanation of previous developments.

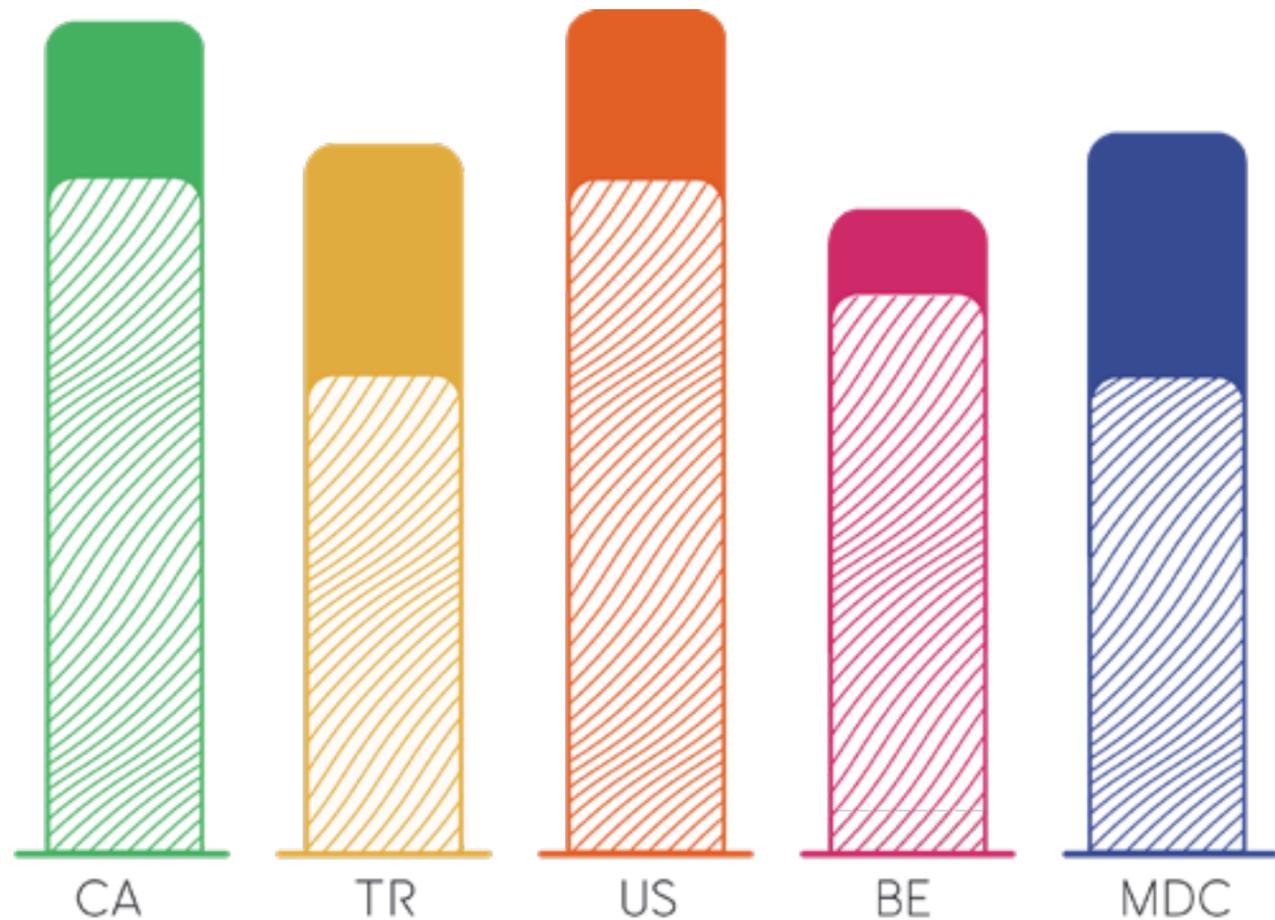


Figure 49: My growth in all expertise areas.

The textured part shows my development before the final bachelor project. My goal was to level everything out with CA and US rising above a little bit.

6. Personal Growth

6.2 Creativity and Aesthetics

Goal

I did not define a goal for this expertise area in my PDP, as I focus on Creativity and Aesthetics (CA) quite automatically. This section will discuss my Design and Research Processes goal of implementing critical design practices. It involved the CA skill of implementing multiple viewpoints in the project.

Activities

CA was employed by designing through associative values. Pre-existing speculative work was used to choose for the application of a tuneable conversational AI. The materials and look of the final design were based on associations between shapes and materials and the agreeable – disagreeable dualism.

In the end, critical design was mostly used to frame the position of the project in relation of similar works. It helped in deciding to go for a near-future and probable scenario. Additionally, it helped me think about the project in terms of conversational value rather than user experience and feasibility.

I also did some illustrating and animating. I created an interactive animation to support user test 1. Next to that, I developed the visual style of Deary, which is reflected in all deliverables and materials supporting the cultural probe.

Competencies gained

The application of critical design thinking led to a prototype that was novel for users but still usable and contemporary. This was mostly because the futures cone, which made it easy to structure speculative works in time and probability. This structure could then be used to point out a research/design gap and expectations of future developments as presented by popular work. I can now use the futures cone in a similar way in coming projects to create interesting experiences, leading to a possible unique selling point.

Evaluation of goal

Although critical design was not implemented exactly as I envisioned in my goal, my goal is reached. The way I implemented critical design practices led to an interesting and realistic prototype.

6. Personal Growth

6.3 Technology and Realization

Goal

My goal for Technology and Realization (TR) was to use 3D printing in at least one prototype.

Activities

I created multiple prototypes that used 3D printing. One of these 3D printed prototypes was used to create an alginate mould to cast plaster. For my final prototype, I also created a simple custom sensor with the use of conductive paint.

Competencies gained

I learned that to effectively 3D print, it is good practice to first sketch the prototype, then make a lo-fi full scale version and then make a 3D model. Before printing, it is good to review all the parts with a person who has experience in mechanical engineering and/or 3D printing. The prototype created in phase 3 went straight from a sketch to a 3D print and failed consequently. For my final prototype, I used the process described above to reach a working prototype.

I learned how to make an alginate mould and to cast plaster. Not all details are transferred perfectly to plaster and parts with surfaces disconnected from the ground are hard to cast. It also is quite an expensive and long process, which makes it unviable for rapid prototyping.

Evaluation of goal

Although I still struggle with moving parts, I can proudly say that my goal is reached and that I can now use 3D printing in a design process.

6. Personal Growth

6.4 User and Society

Goal

I did not define a goal for this expertise area, in my PDP as I focus on User and Society (US) quite automatically.

Activities

The process featured research with potential users and experts. Many of the research methods used were unfamiliar to me before this project. Table 9 shows which research methods were new to me.

The project also introduced me to participatory design. I tried to implement it in my project by involving the same participants in all user research. However, it was not the optimal form of participatory design as the design was not directly beneficial to the participants and all user research except for the cultural probe took place in a lab setting. I would like to perform a more traditional participatory design process in the future to find out how active user involvement in a project can lead to personal design insights.

Competencies gained

I gained experience in using the research methods that were unfamiliar to me. The user evaluation methods I tried provided unambiguous insights. That is because the methods were validated and the ways to analyse the data were predefined. The personal research methods provided inspiration through a realistic context. They give a unique insight on how users think and feel. With the experience gained in this project, I can more effectively apply research methods in coming projects.

Phase	Methods
2 - Problem Definition	<i>Simulating a long-term experience via animation-guided wizard of oz; MS product cards; Geneva emotion wheel; UX curve</i>
3 - Solution Discovery	<i>Co-creation session</i>
4 - Concept Validation	<i>Cultural Probe</i>

Table 9 - Research methods I applied, with which I was unfamiliar before the project.

6. Personal Growth

6.5 Business and Entrepreneurship

Goal

My goal for Business and Entrepreneurship (BE) was to use business related tools and canvases throughout the project to steer the project in a realistic, market-worthy direction.

Activities

I tried to use business canvases throughout the project (appendix P shows an example). However, it was soon noticed that using tools and canvases throughout a project was not helpful when there was not a clear scoping or solution. It was also not good in combination with the goal to use critical design, which is focused on designing for the future and not on creating a realistic business. When writing the first version of the report, some business-related canvases were filled in (see appendix Q) and an idealistic business model was created, as discussed in the final design description.

Competencies gained

No competencies were gained in business and entrepreneurship. I might redo the goal in a future project to learn how to realistically use the BE tools I learned throughout my bachelor. When I do, I will define specific points in the project to use the tools. These tools will then be used as an evaluation on how realistic my design is.

Evaluation of goal

The goal was not reached.

6. Personal Growth

6.6 Math, Data and Computing

Goal

My goal for Math Data and Computing (MDC) was to learn how to design user-centeredly with AI. The goal was reached once I created a transparent AI system that learns from the user.

Activities

I learned about the types of AI, the processes behind it, how AI is used and how it is perceived in everyday life. I learned that it is a long process to train an AI yourself, but there are tools to use to quickly create prototypes. I learned how to create conversational user interfaces with Boost.ai (see appendix R for certificates) and used that knowledge to create the conversational part of my prototype in Dialogflow.

Next to that, I learned how to use Raspberry Pi. The creation of the featured prototype featured my first experience with programming in python for interactive use (see appendix . for wiring and coding of the final prototype). The prototype also featured my first self-made sensor.

Competencies gained

The insight gained in AI through this project allow me to use AI in future projects. I am able to use tools based on models trained by other people to make lo-fi prototypes. With a little more research, I will be able to create a simple neural network to use machine learning.

I will be able to use Raspberry Pi in future projects where more versatility and computing power than Arduino is needed. The same materials that I used for my self-made sensor can be used to create potentiometer-like sensors in all shapes in the future.

Evaluation of goal

The prototype I made uses natural language processing (NLP) but does not learn from the user. I let the product express its limitations and provided a booklet to make the product more transparent. My goal is not officially reached because a quick iterative process does not allow for the creation of a model trained on user data. However, I gathered valuable knowledge that can be used in future projects.

References

Abdul, A., Vermeulen, J., Wang, D., Lim, B. Y., & Kankanhalli, M. (2018, April). Trends and trajectories for explainable, accountable and intelligent systems: An hci research agenda. In Proceedings of the 2018 CHI conference on human factors in computing systems (pp. 1-18).

Ahmad, R., Siemon, D., Fernau, D., & Robra-Bissantz, S. (2020). Introducing "Raffi": A Personality Adaptive Conversational Agent. In PACIS (p. 28).

Amershi, S., Weld, D., Vorvoreanu, M., Fournay, A., Nushi, B., Collisson, P., ... & Horvitz, E. (2019, May). Guidelines for human-AI interaction. In Proceedings of the 2019 chi conference on human factors in computing systems (pp. 1-13).

Auger, J. (2013). Speculative design: crafting the speculation. *Digital Creativity*, 24(1), 11-35.

Baker, J. (2019, September 3). The Designer's Guide to AI-Driven UX - Muzli - Design Inspiration. Medium. Retrieved 9 January 2022, from <https://medium.muz.li/the-designers-guide-to-ai-driven-uxafbebded1be3>

Benedek, J., & Miner, T. (2002). Product reaction cards. *Microsoft*, July, 29.

Borenstein, J., & Arkin, R. (2019). Robots, ethics, and intimacy: the need for scientific research. In *On the cognitive, ethical, and scientific dimensions of artificial intelligence* (pp. 299-309). Springer, Cham.

Boucher, P. (2019, March). How artificial intelligence works. European Parliamentary Research Service. <https://www.europarl.europa.eu/at-your-service/files/be-heard/religious-and-non-confessional-dialogue/events/en-20190319-how-artificial-intelligence-works.pdf>

Boyle, G. J. (1995). Myers-Briggs type indicator (MBTI): some psychometric limitations. *Australian Psychologist*, 30(1), 71-74.

Buchenau, M., & Suri, J. F. (2000, August). Experience prototyping. In Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques (pp. 424-433).

Buitenplaats Doornburgh. (2021). Robots in Captivity. Retrieved 16 February 2022, from <https://www.buitenplaatsdoornburgh.nl/binnenkort-robots-in-captivity/>

Cajochen, C., Frey, S., Anders, D., Späti, J., Bues, M., Pross, A., ... & Stefani, O. (2011). Evening exposure to a light-emitting diodes (LED)-backlit computer screen affects circadian physiology and cognitive performance. *Journal of applied physiology*, 110(5), 1432-1438.

Castillo, J. (2017). The relationship between big five personality traits, customer empowerment and customer satisfaction in the retail industry. *Journal of Business and Retail Management Research (JBRMR)*, 11(2).

Celikoglu, O. M., Ogut, S. T., & Krippendorff, K. (2017). How do user stories inspire design? A study of cultural probes. *Design Issues*, 33(2), 84-98.

Celli, F., & Lepri, B. (2018, December). Is Big Five Better than MBTI? A Personality Computing Challenge Using Twitter Data. In *CLIC-it*.

Chen, M. (2021, December 15). The Zendesk Triple Diamond – Zendesk Design. Medium. Retrieved 9 January 2022, from <https://medium.com/zendesk-creative-blog/the-zendesk-triple-diamond-processfd857a11c179>

De Vries, S., (2022). Deary. *Srqdesign*. Retrieved 22 February 2022, from <https://srqdesign.nl/Deary>

De Vries, S., (2022, February). User test 1 animation and sound [Video]. *Vimeo*. Retrieved 21 February, from <https://vimeo.com/680185952>

Elizarova, O., & Dowd, K. (2017, December 14). Participatory Design in Practice. *UX Magazine*. Retrieved 16 February 2022, from <https://uxmag.com/articles/participatory-design-in-practice>

Ellison, M. (Producer), Jonze, S. (Producer), Landay, V. (Producer) & Jonze, S. (Director). (2013). *Her* [Film]. Warner Bros. Pictures.

European Commission. (2021, March 5). Ethics Guidelines for Trustworthy AI. *FUTURIUM – European Commission*. Retrieved 14 February 2022, from <https://ec.europa.eu/futurium/en/ai-alliance-consultation.1.html>

Gnewuch, U., Morana, S., & Maedche, A. (2017, December). Towards Designing Cooperative and Social Conversational Agents for Customer Service. In *ICIS*.

Goode, L. (2018). Life, but not as we know it: AI and the popular imagination. *Culture Unbound*, 10(2), 185-207.

Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour research and therapy*, 44(1), 1-25.

Herrman, H., Stewart, D. E., Diaz-Granados, N., Berger, E. L., Jackson, B., & Yuen, T. (2011). What is resilience?. *The Canadian Journal of Psychiatry*, 56(5), 258-265.

Hersenstichting. (2020, March 6). Hoe slaapt Nederland? Retrieved 21 February 2022, from <https://www.hersenstichting.nl/slaap-cijfers/>

Hershner, S., & Shaikh, I. (2020, August). Healthy Sleep Habits. *Sleep Education*. Retrieved 10 January 2022, from <https://sleepeducation.org/healthy-sleep/healthy-sleep-habits/>

IDEO. (n.d.). Design Kit. Design Kit. Retrieved 11 January 2022, from <https://www.designkit.org/methods/co-creation-session>

Jung, T. Y., Seo, Y. J., & Hu, S. H. (2018). Effects of Vocal Rate and Pitch on Perception of Personality Traits: With the Normally Sighted and the Blind. *Journal of Digital Contents Society*, 19(11), 2085-2092.

Kujala, S., Roto, V., Väänänen-Vainio-Mattila, K., Karapanos, E., & Sinelä, A. (2011). UX Curve: A method for evaluating long-term user experience. *Interacting with computers*, 23(5), 473-483.

Liang, Y., & Lee, S. A. (2017). Fear of autonomous robots and artificial intelligence: Evidence from national representative data with probability sampling. *International Journal of Social Robotics*, 9(3), 379-384.

Lim, A. G. Y. (2020). Big Five Personality Traits | Simply Psychology. *Simply Psychology*. Retrieved 9 January 2022, from <https://www.simplypsychology.org/big-five-personality.html>

Liu, Y., Kim, D. J., Miao, T., & Chuang, Y. (2020, October). SlumberBot: An Interactive Agent for Helping Users Investigate Disturbance Factors of Sleep Quality. In Proceedings of the 11th Nordic Conference on Human-Computer Interaction: Shaping Experiences, Shaping Society (pp. 1-4).

Lovejoy, J. (2018, January 25). The UX of AI - Library. *Google Design*. Retrieved 9 January 2022, from <https://design.google/library/ux-ai/>

McGehee, F. (1944). An experimental study of voice recognition. *The Journal of General Psychology*, 31(1), 53-65.

NEO Facets Table. (n.d.). International Personality Item Pool. Retrieved 21 February 2022, from https://ipip.ori.org/newNEO_FacetsTable.htm

Nguyen, S. S., Kim, D. J., Miao, T., & Chuang, Y. (2020, October). Designing for Triggering Self-Investigations and Reflections on Factors Related to Sleep Health. In Proceedings of the 11th Nordic Conference on Human-Computer Interaction: Shaping Experiences, Shaping Society (pp. 1-4).

NOS. (2021, November 11). Studenten kampen met mentale problemen: 'Docent kon mij niet helpen'. Retrieved 12 January 2022, from <https://nos.nl/artikel/2405264-studenten-kampen-met-mentale-problemen-docent>

Notter, M., Luebbe, C., Miribel, A., & EPFL Extension School. (2021). AI - Two Letters, Many Meanings. *That's AI*. Retrieved 13 February 2022, from <https://www.thats-ai.org/en-GB/units/ai-two-letters-many-meanings>

Parviainen, E., & Søndergaard, M. L. J. (2020, April). Experiential qualities of whispering with voice assistants. In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (pp. 1-13).

Polzehl, T. (2015). Personality in speech. *Assessment and automatic classification*.

Robot Love. (2018, December 4). Homepage Retrieved 16 February 2022, from <https://robotlove.nl/>

Rogers, J., Clarke, L., Skelly, M., Taylor, N., Thomas, P., Thorne, M., ... & von Grafenstein, M. (2019, May). Our friends electric: Reflections on advocacy and design research for the voice enabled internet. In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (pp. 1-13).

Sacharin, V., Schlegel, K., & Scherer, K. R. (2012). Geneva emotion wheel rating study.

Schoemaker, C., Kleinjan, M., Van der Borg, W., Busch, M., Muntinga, M., Nuijen, J., & Dedding, C. (2019). Mentale gezondheid van jongeren: enkele cijfers en ervaringen.

Tharp, B., & Tharp, S. (2015, December 9). What is Discursive Design? *Core77*. Retrieved 16 February 2022, from <https://www.core77.com/posts/41991/What-is-Discursive-Design>

Therapist Aid. (2021). Leaves on a Stream (Worksheet). Retrieved 10 January 2022, from <https://www.therapistaid.com/therapy-worksheet/leaves-on-a-stream-worksheet>

Turan, S. (2013). Onderzoek naar de psychometrische eigenschappen van de Resilience Scale-Nederlandse Versie bij mensen met een lage sociaaleconomische status en verschillende etnische achtergronden (Bachelor's thesis, University of Twente).

UK Design Council. (2019, september 10). What is the framework for innovation? Design Council's evolved Double Diamond. Retrieved 9 January 2022, from <https://www.designcouncil.org.uk/news-opinion/whatframework-innovation-design-councils-evolved-double-diamond>

Völkel, S. T., Schödel, R., Buschek, D., Stachl, C., Winterhalter, V., Bühner, M., & Hussmann, H. (2020, April). Developing a personality model for speech-based conversational agents using the psycholexical approach. In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (pp. 1-14).

Voros, J. (2003). A generic foresight process framework. *foresight*.

VPRO. (2020, August 4). Technologie als religie - VPRO Tegenlicht. Retrieved 9 January 2022, from <https://www.vpro.nl/programmas/tegenlicht/kijk/afleveringen/2020-2021/technologie-als-religie.html>

Weissenberger, C., Nutsi, A., Friedrich, P., Lubkowitz, M. (n.d.). 6-3-5 Method. Retrieved 26 November 2021, from <https://www.design-thinkingmethods.com/en/3Ideenfindung/6-3-5.html>

Wells, K., & McCaig, M. (2016). The magic wand question and recovery focused practice in child and adolescent mental health services. *Journal of Child and Adolescent Psychiatric Nursing*, 29(4), 164-170

Wikipedia contributors. (2021, November 24). Agreeableness. *Wikipedia*. Retrieved 21 February 2022, from <https://en.wikipedia.org/wiki/Agreeableness>

Woudenberg, S., van der Scheun, M., Ihle, A., StudentWeetRaad, C., & van der Steen, I. (2020). Wat zijn de factoren die bijdragen aan de mentale gezondheid van studenten in de leeftijd van 17-25 jaar?.

Yang, Q., Steinfeld, A., & Zimmerman, J. (2019, May). Unremarkable ai: Fitting intelligent decision support into critical, clinical decision-making processes. In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (pp. 1-11).

E. Appendices

Table of Contents

<u>A: Recruitment poster questionnaire</u>	<u>i</u>	<u>Q: Final business canvases</u>	<u>cxix</u>
<u>B: Translation and coding animation phase 2</u>	<u>vii</u>	<u>R: Boost-AI certificates</u>	<u>cxxiv</u>
<u>C: User test 1 protocol + result + analysis</u>	<u>xiv</u>	<u>S: ERB form</u>	<u>cxxvii</u>
<u>D: Expert 1 interview setup and results</u>	<u>xxix</u>	<u>T: Deliverables midterm demo day</u>	<u>cxxxvi</u>
<u>E: Expert 2 interview setup + notes taken</u>	<u>xxxvi</u>	<u>U: Deliverables final demo day</u>	<u>cxxxviii</u>
<u>F: Decision tree + screenshots Dialogflow</u>	<u>xl</u>		
<u>G: Results cocreation</u>	<u>lxxii</u>		
<u>H: Wiring + code semifinal prototype</u>	<u>lxxiii</u>		
<u>I: Cultural probe booklet 1</u>	<u>lxxviii</u>		
<u>J: RS-NL Questionnaire</u>	<u>lxxxiv</u>		
<u>K: Transcriptions + themes cultural probe</u>	<u>lxxxviii</u>		
<u>L: Wiring + code final prototype</u>	<u>ciii</u>		
<u>M: Files final user test</u>	<u>cvii</u>		
<u>N: Written interview AI student</u>	<u>cxii</u>		
<u>O: Personal Development Plan</u>	<u>cxiv</u>		
<u>P: value proposition canvas phase 1</u>	<u>cxviii</u>		

A: Recruitment poster questionnaire

1/10/22, 9:14 AM

Welkom bij deze vragenlijst

Welkom bij deze vragenlijst

Hoi! Leuk en fijn dat je mij wil helpen met mijn onderzoek.

Ik ben Simon de Vries en ik doe nu mijn bachelor eindproject Industrial Design op de TU. Het gaat over kunstmatige intelligentie (in het formulier vooral "AI" genoemd). Ik wil met dit project een speelse en mooie manier maken waarop mensen kunnen ontdekken hoe AI werkt en wat je met AI kunt doen.

Hiervoor wil ik graag samenwerken met mensen in de wijk: zoals jij dus!

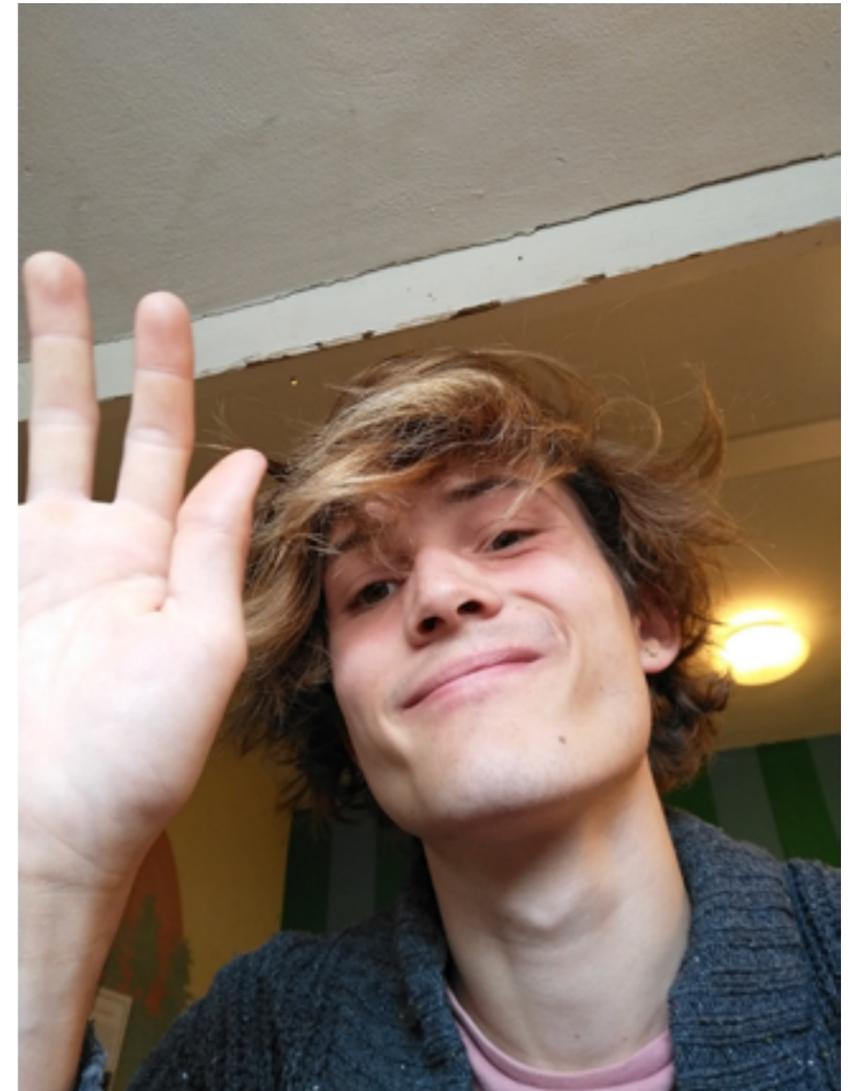
In deze vragenlijst stel ik introducerende vragen over demografie en hoe AI wordt gezien.

***Vereist**

1/10/22, 9:14 AM

Welkom bij deze vragenlijst

Dit ben ik



Formele Toestemming

Om de antwoorden die u op dit formulier geeft te mogen gebruiken voor mijn project, moet ik u vragen om formele toestemming.

Voor formele toestemming moet u akkoord gaan met het volgende:

- Indien u jonger dan 16 bent, kunt u helaas geen formele toestemming geven vanwege de GDPR richtlijnen (<https://gdpr-info.eu>).
- Ik (de participant) heb informatie gekregen en ik begrijp waar dit onderzoek over gaat. Ik had genoeg tijd om te beslissen of ik meedoe.
- Ik (de participant) weet dat meedoen vrijwillig is. Ook weet ik dat ik op ieder moment kan beslissen om toch niet mee te doen of te stoppen met het onderzoek. Daarvoor hoef ik geen reden te geven.
- Ik (de participant) weet dat sommige mensen mijn gegevens kunnen inzien. Die mensen zijn Simon de Vries en zijn teacher coach vanuit de TU/e, Yaliang Chuang.
- Ik (de participant) geef toestemming voor het verzamelen en gebruiken van mijn gegevens voor wetenschappelijke publicaties en meer of ander onderzoek op mijn gegevens. Deze gegevens omvatten de antwoorden op de vragen van dit formulier.
- Ik (de participant) geef toestemming om mijn gegevens op de onderzoekslocatie nog 5 jaar na dit onderzoek te bewaren.
- In het geval dat ik (Simon) u in de toekomst vraag om mee te doen met een vervolgstudie op deze vragenlijst, zal ik u nogmaals vragen voor formele toestemming, aangepast op die volgende studie.
- Indien u persoonlijke gegevens opgeeft, zal ik die in publicaties niet of ge-anonimiseerd vermelden.
- Ik (Simon) wil benadrukken dat u altijd kan stoppen met het invullen van deze vragenlijst. Pas als u aan het einde "verzenden" klikt, worden de gegevens die u hebt ingevoerd doorgestuurd en kan ik (Simon) ze zien.

1. Ik heb het bovenstaande zorgvuldig gelezen en geef formele toestemming voor het afnemen van deze vragenlijst. *

Markeer slechts één ovaal.

- Ja *Ga naar vraag 2*
- Nee

Demografie

In dit onderdeel vraag ik een paar dingen over je persoonsgegevens. Op die manier kan ik de gegevens die uit dit formulier komen, categoriseren.

2. Ik identificeer me als: *

Markeer slechts één ovaal.

- Man
- Vrouw
- Zeg ik liever niet
- Anders: _____



3. Dit is mijn leeftijd: *

Markeer slechts één ovaal.

- 0 - 15 jaar
- 16 - 30 jaar *Ga naar vraag 8*
- 31 - 45 jaar *Ga naar vraag 8*
- 45+ *Ga naar vraag 8*
- Zeg ik liever niet *Ga naar vraag 8*

4. Mijn hoogst genoten (en afgerond) onderwijsniveau is: *

Markeer slechts één ovaal.

- Basisschool
- Praktijkonderwijs
- VMBO
- MAVO
- HAVO
- VWO/Gymnasium/Atheneum/tto
- MBO
- HBO Bachelor
- HBO Master
- WO Bachelor
- WO Master
- PhD
- Zeg ik liever niet
- Anders: _____

5. Ik ben momenteel een student: *

Markeer slechts één ovaal.

- Ja
- Nee
- Zeg ik liever niet

6. (indien van toepassing) Dit is mijn studierichting:

7. (indien van toepassing) Ik zou mijn baan en functie als volgt beschrijven:

Je mening

Dit onderdeel bevat wat vragen om meer te weten te komen over jouw blik op de wereld.



8. Als ik aan AI denk, denk ik vooral aan het volgende: *

Markeer slechts één ovaal.



:



-



.



'.



"



;

Anders: _____

9. Als ik een wens had om magisch iets te veranderen of toe te voegen in mijn leven of omgeving, zou ik dit ermee doen: *



10. Deze foto laat het best zien wat ik doe in mijn vrije tijd: *

Markeer slechts één ovaal.



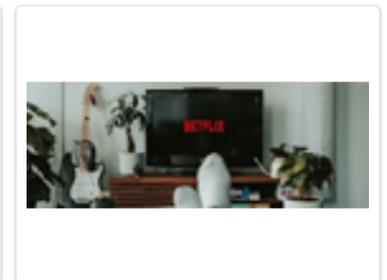
.



,



:



;



-



"

Anders: _____

11. Ik wil nog iets toevoegen:

Het
einde

Dankjewel voor het invullen van deze vragenlijst! Hiermee krijg ik een glimp van waar mensen in stratum waarde aan hechten :)

Wil je me verder helpen met dit project?

Nogmaals bedankt! Ik hoop dat de vragenlijst voor jou ook interessant was om in te vullen. Wil je op de hoogte blijven van het project of nog meer bijdragen, dat kan! Ik ga komende tijd (het project loopt tot en met februari) veel input nodig hebben.

De vragen in dit formulier waren erg breed. Om een beter idee te krijgen wat er precies speelt en om jouw mening te krijgen over het product wat ik ga maken, nodig ik je graag uit voor een vervolg groepsgesprek en gebruikerstests. Deze moeten nog gepland worden. Als je je gegevens hieronder doorgeeft, kan ik je op de hoogte houden!

12. Ik wil graag op de hoogte gehouden van dit project *

Markeer slechts één ovaal.

Ja Ga naar vraag 13

Nee Ga naar sectie 6 (Dankjewel!)

Contactgegevens

Laat me weten hoe ik je kan bereiken om vervolgssessies te plannen

13. Naam (voor- en achternaam)

14. Emailadres

15. Telefoonnummer

16. Waarvoor kan ik je bereiken?

Vink alle toepasselijke opties aan.

Updates over het project

Een interview of groepsgesprek

Gebruikerstests van het product wat ik ga maken

Anders: _____

Dankjewel!

Vergeet niet naar beneden te scrollen om op verzenden te klikken

Voor vragen over het project kan je mij altijd bereiken via s.r.g.d.vries@student.tue.nl

Deze content is niet gemaakt of goedgekeurd door Google.

Google Formulier

V

External images used in this form (from top to bottom, left to right):

1. Terminator: Dark Fate. (n.d.). [Film still]. Filmtotaal. <https://www.filmtotaal.nl/film/30633>
2. Pipis, G. (2020, September 11). Python Autocorrection [Screenshot]. Predictive Hacks. <https://predictivehacks.com/how-to-build-an-autocorrect-in-python/>
3. Stanford Online. (n.d.). Statistics [Illustration]. Stanford Online. <https://online.stanford.edu/programs/statistics-graduate-program>
4. Saurenmann, R., & Cassada, K. (2017, April 4). Avatarion helps sick children stay connected [Photo]. Microsoft Github. <https://microsoft.github.io/techcasestudies/iot/2017/04/04/avatarion.html>
5. Snoek, C. (2021). Computer Vision by Learning [Screenshot]. Ascii TU Delft. <https://ascii.tudelft.nl/project/a25-computer-vision-by-learning/>
6. JustETF. (n.d.). The Best Indices for Robotics ETF's [Photo]. JustETF. <https://www.justetf.com/en/how-to/invest-in-robotics.html>
7. Mindful Parenting. (2019, August 21). [Photo]. Healthline. <https://www.healthline.com/health/parenting/mindful-parenting>
8. Velthuisen, P. (2018, January 20). Wandelaars en Fietsers Gaan Gewoon het Bos In [Photo]. De Stentor. <https://www.destentor.nl/apeldoorn/wandelaars-en-fietsers-gaan-gewoon-het-bos-in~af89949f/>
9. Tips voor Verantwoord Gamen. (n.d.). [Photo]. Gamen Info. <https://www.gameninfo.nl/verantwoord-gamen>
10. Waarom Is Netflixen Leuker Dan Lezen? (2020, July 17). [Photo]. De Tweede Verdieping. <https://www.detweedeverdieping.nu/waarom-is-netflixen-leuker-dan-lezen/>
11. Shuraev, Y. (n.d.). Mensen Kerels Spelen Sport [Photo]. Pexels. <https://www.pexels.com/nl-nl/foto/mensen-kerels-spelen-sport-8693795/>
12. 10 Leuke Terrassen in Eindhoven. (2021, May). [Photo]. MAN MAN. <https://man-man.nl/leuke-terrassen-eindhoven/>

B: Translation and coding animation phase 2

User_Test_Clock

//this sketch creates an interactive animation for the use of my first user test.

//setting up libraries

```
import processing.sound.*;
SoundFile[] night_1 = new SoundFile[5];
SoundFile[] day_1 = new SoundFile[5];
SoundFile[] night_2 = new SoundFile[5];
SoundFile[] day_2 = new SoundFile[5];
boolean shiftIsPressed;
boolean CTRLIsPressed;
boolean altIsPressed;
boolean tabIsPressed;
```

//variables for defining what part of the story the algorithm is in

```
int act;
int scene;
boolean sceneStarted;
int sceneMaxTime;
int startTime;
int busyTime;
float percent;
```

//variables for drawing the clock

```
float radius;
float inCirRadius;
float minHourStart;
float minRadius;
float hourRadius;
```

```
void setup(){
```

```
  fullScreen();
```

```
  //giving values to variables for the lengths of clock lines
```

```
  radius = min(width,height)*0.8;
```

```
  inCirRadius = radius/16;
```

```
  minHourStart = radius/16;
```

```
  minRadius = radius/3;
```

```
  hourRadius = radius/4;
```

```
//defining the audio files
```

```
for(int i = 0; i<5; i++){
```

```
  int l = i+1;
```

```
  night_1[i]= new SoundFile(this, "nacht 1 - " + l + ".wav");
```

```
  day_1[i]= new SoundFile(this, "dag 1 - " + l + ".wav");
```

```
  night_2[i]= new SoundFile(this, "nacht 2 - " + l + ".wav");
```

```
  day_2[i]= new SoundFile(this, "dag 2 - " + l + ".wav");
```

```
}
```

```
//defining that we are at the beginning of the story
```

```
act = 1;
```

```
scene = 0;
```

```
sceneStarted = false;
```

```
}
```

```
void draw(){
```

```
  background(0);
```

```
  text("act: " + act, 10, 10);
```

```
  text("scene: " + scene, 10, 20);
```

```
//check if sound needs to be played
```

```
soundCheck();
```

```
if( act == 1){
```

```
  //defining animations to do to go from each scene to the next
```

```
  if(sceneStarted){
```

```
    busyTime = millis()-startTime;
```

```
    percent = map(busyTime, 0, sceneMaxTime*1000, 0, 100);
```

```
  if(scene == 1){
```

```
    drawClock(percent);
```

```
  }
```

```
  if(scene == 2){
```

```
    drawClock(100);
```

```
    drawArms(10,60, percent, 1);
```

```
  }
```

```
  if(scene == 3){
```

```
    drawClock(100 - percent);
```

```
    drawArms(10,60,100 - percent, 1);
```

```
    spawnMoon(percent);
```

```
  }
```

```
  if(scene == 4){
```

```
    moonClock(percent);
```

```
  }
```

```
  if(percent >= 100){
```

```
    sceneStarted = false;
```

```
  }
```

```
}
```

```
//defining static images
```

```
else if(!sceneStarted){
```

```
  if(scene == 1){
```

```
    drawClock(100);
```

```
  }
```

```
  if(scene == 2){
```

```
    drawClock(100);
```

```
    drawArms(10, 60,100, 1);
```

```
  }
```

```
  if(scene == 3){
```

```
    spawnMoon(100);
```

```
  }
```

```
  if(scene == 4){
```

```
    moonClock(100);
```

```
  }
```

```
}
```

```
}
```

```
if(act == 2){
```

```
  //defining animations to do to go from each scene to the next
```

```
  if(sceneStarted){
```

```
    busyTime = millis()-startTime;
```

```
    percent = map(busyTime, 0, sceneMaxTime*1000, 0, 100);
```

```
  if(scene == 0){
```

```
    dayBG(percent);
```

```
    moonClock(100-percent);
```

```
  }
```

```

if(scene ==1){
  dayBG(100);
  spawnMoon(100-percent);
  drawClock(percent);
  drawArms(6,60,percent, 1);
}

if(percent >= 100){
  sceneStarted = false;
}
}

//defining static images
else if(!sceneStarted){
  if(scene == 0){
    dayBG(100);
    moonClock(0);
  }

  if(scene == 1){
    dayBG(100);
    drawClock(100);
    drawArms(6, 60,100, 0);
  }
}

if(act == 3){
  if(sceneStarted){
    busyTime = millis()-startTime;
    percent = map(busyTime, 0, sceneMaxTime*1000, 0, 100);

    if(scene == 0){
      dayBG(100 - percent);
      drawArms(10,60, percent, 0);
      drawClock(100);
    }

    if(scene == 1){
      drawClock(100 - percent);
      drawArms(10,60,100 - percent, 1);
    }
  }
}

```

```

spawnMoon(percent);
}

if(scene == 2){
  moonClock(percent);
}

if(percent >= 100){
  sceneStarted = false;
}
}

else if(!sceneStarted){
  if(scene == 0){
    drawClock(100);
    drawArms(10,60,100,0);
  }

  if(scene == 1){
    spawnMoon(100);
  }

  if(scene == 2){
    moonClock(100);
  }
}

if(act == 4){
  //defining animations to do to go from each scene to the next
  if(sceneStarted){
    busyTime = millis()-startTime;
    percent = map(busyTime, 0, sceneMaxTime*1000, 0, 100);

    if(scene == 0){
      dayBG(percent);
      moonClock(100-percent);
    }

    if(scene ==1){
      dayBG(100);
      spawnMoon(100-percent);
    }
  }
}

```

```

drawClock(percent);
drawArms(6,60,percent, 1);
}

if(scene ==2 ){
  dayBG(100);
  drawClock(100-percent);
  drawArms(6,60,100-percent,1);
}

if(percent >= 100){
  sceneStarted = false;
}
}

else if(!sceneStarted){
  if(scene == 0){
    dayBG(100);
    moonClock(0);
  }

  if(scene == 1){
    dayBG(100);
    drawClock(100);
    drawArms(6, 60,100, 1);
  }
}

if(scene == 2){
  dayBG(100);
  exit();
}
}
}

```

DrawClock

```

//draw the clock for a certain time
//inspiration for the clock position taken from this example: https://processing.org/examples/clock.html
void drawClock(float percent){
  //defining variables

```

```

float opacity = map (percent, 0, 100, 0, 255); //for opacity and timing from 0 to 255

//setting up the illustration
ellipseMode(CENTER);
translate(width/2, height/2);
fill(255, opacity);
stroke(255, opacity);

//drawing the clock
//ellipse(0,0,height/20,height/20);
noFill();
strokeWeight(5);
ellipse(0,0,radius*0.8,radius*0.8);

//resetting, to avoid weird things from happening
translate(-width/2, -height/2);
}

//draw the arms
void drawArms(int hour, int min, float percent, int percentInfluence){
//defining variables
float opacity = map (percent, 0, 100*percentInfluence, 0, 255); //for opacity and timing from 0 to 255

//setting up the illustration
ellipseMode(CENTER);
translate(width/2, height/2);
stroke(255, opacity);

// for the positions of the clock arms
float minPercent = map (percent, 0, 100, -60, 0);
float hourPercent = map (percent, 0, 100, -24, 0);
float m = map(min+minPercent, 0, 60, 0, TWO_PI) - HALF_PI;
float h = map(hour+hourPercent, 0, 24, 0, TWO_PI * 2) - HALF_PI;
//drawing the arms
line(cos(m) * minHourStart, sin(m) * minHourStart, cos(m) * minRadius, sin(m) * minRadius); //minutes
line(cos(h) * minHourStart, sin(h) * minHourStart, cos(h) * hourRadius, sin(h) * hourRadius); //minutes

//resetting, to avoid weird things from happening
translate(-width/2, -height/2);
}

```

DrawMoon

```

//this tab is for coding the shapeshift from clock to moon. it will be done with bezier vertices
void spawnMoon(float percent){
//setting up some variables;
float opacity = map (percent, 0, 100, 0, 255); //for opacity and timing from 0 to 255

//setting up the illustration
ellipseMode(CENTER);
translate(width/2, height/2);
fill(255, opacity);
stroke(255, opacity);

//drawing the clock/moon
noFill();
strokeWeight(5);
beginShape();
vertex(0,-radius/2.5);
quadraticVertex(radius/2.5, -radius/2.5, radius/2.5, 0);
quadraticVertex(radius/2.5, radius/2.5, 0, radius/2.5);
quadraticVertex(-radius/2.5, radius/2.5, -radius/2.5, 0);
quadraticVertex(-radius/2.5, -radius/2.5, 0, -radius/2.5);

endShape();
//resetting, to avoid weird things from happening
translate(-width/2, -height/2);
}

void moonClock(float percent){
//setting up some variables;
float invMorePercentDec = map(percent, 0, 100, 1, -0.5);
float otherPercent = map(percent, 0, 100, 1, 0.5);
float thirdPercent = map(percent, 0, 100, 1, 1.125);

float minOpacity = map (percent, 0, 100, 255, 0); //for opacity and timing from 255 to 0
//setting up the illustration
ellipseMode(CENTER);
translate(thirdPercent*width/2, height/2);
fill(255, percent);
stroke(255, minOpacity);

```

ix

```

//drawing the clock/moon
strokeWeight(5);
beginShape();
  vertex(0,-radius/2.5);
  quadraticVertex(invMorePercentDec*radius/2.5, otherPercent*-radius/2.5,
invMorePercentDec*radius/2.5, 0);
  quadraticVertex(invMorePercentDec*radius/2.5, otherPercent*radius/2.5, 0, radius/2.5);
  quadraticVertex(-radius/2.5, radius/2.5, -radius/2.5, 0);
  quadraticVertex(-radius/2.5, -radius/2.5, 0, -radius/2.5);

endShape();
//resetting, to avoid weird things from happening
translate(-thirdPercent*width/2, -height/2);
}

bg_day
void dayBG(float percent){
float r = map(percent, 0, 100, 0, 255);
float g = map(percent, 0, 100, 0, 234);
float b = map(percent, 0, 100, 0, 164);
background(r,g,b);
}

sceneActions
//this tab is for coding what needs to happen after each 'scene'
//only numbers is for going to the next scene

void keyPressed(){
//going from scene to scene
if(!sceneStarted && key != SHIFT && key != CONTROL && key != TAB && key != ALT){
  if(act == 1){
    if(scene == 0 && key == '1'){
      sceneMaxTime = 3;
      percent = 0;
      startTime = millis();
      sceneStarted = true;
      if(percent == 0){
        scene = 1;
      }
    }
  }
}
}

```

```

if (scene == 1 && key == '2'){
  sceneMaxTime = 1;
  percent = 0;
  startTime = millis();
  sceneStarted = true;
  if(percent == 0){
    scene = 2;
  }
}
if (scene == 2 && key == '3'){
  sceneMaxTime = 5;
  percent = 0;
  startTime = millis();
  sceneStarted = true;
  if(percent == 0){
    scene = 3;
  }
}
if (scene == 3 && key == '4'){
  sceneMaxTime = 5;
  percent = 0;
  startTime = millis();
  sceneStarted = true;
  if(percent == 0){
    scene = 4;
  }
}

if (scene == 4 && key == ENTER){
  sceneMaxTime = 5;
  percent = 0;
  startTime = millis();
  sceneStarted = true;
  if(percent == 0){
    //end act 1
    act = 2;
    scene = 0;
  }
}
}

```

```

if(act == 2){
  if(scene == 0 && key == '1'){
    sceneMaxTime = 1;
    percent = 0;
    startTime = millis();
    sceneStarted = true;
    if(percent == 0){
      scene = 1;
    }
  }
}

if (scene == 1 && key == ENTER){
  sceneMaxTime = 10;
  percent = 0;
  startTime = millis();
  sceneStarted = true;
  if(percent == 0){
    //end act 2
    act = 3;
    scene = 0;
  }
}

if(act == 3){
  if(scene == 0 && key == '1'){
    sceneMaxTime = 1;
    percent = 0;
    startTime = millis();
    sceneStarted = true;
    if(percent == 0){
      scene = 1;
    }
  }
}

if (scene == 1 && key == '2'){
  sceneMaxTime = 5;
  percent = 0;
  startTime = millis();
  sceneStarted = true;
  if(percent == 0){

```

X

```

percent = 0;
startTime = millis();
sceneStarted = true;
if(percent == 0){
  //end act 3
  act = 4;
  scene = 0;
}

if(percent == 4){
  scene == 0 && key == '1';
  sceneMaxTime = 1;
  percent = 0;
  startTime = millis();
  sceneStarted = true;
  if(percent == 0){
    scene = 1;
  }

  if(scene == 1 && key == '2'){
    sceneMaxTime = 5;
    percent = 0;
    startTime = millis();
    sceneStarted = true;
    if(percent == 0){
      scene = 2;
    }
  }
}

```

soundCheck

//you can also play audio, with special key + buttons z-b for unagreeable to agreeable

```

public static boolean allNegatives(SoundFile[] a) {
  if(a == null) {
    return false;
  }
  for(int i = 0; i < a.length; i++) {
    if(a[i].isPlaying())
      return false;
  } return true;
}

void soundCheck(){
  if(keyPressed){
    if(key == 'z'){
      if(act == 1){
        if(allNegatives(night_1)){
          night_1[0].play();
        }
      }
      if(act == 2){
        if(allNegatives(night_1)&&allNegatives(day_1)){
          day_1[0].play();
        }
      }
      if(act == 3){
        if(allNegatives(day_1)&&allNegatives(night_2)){
          night_2[0].play();
        }
      }
      if(act == 4){
        if(allNegatives(night_2)&&allNegatives(day_2)){
          day_2[0].play();
        }
      }
    }
  }

  if(key == 'x'){

```

```

if(act == 1){
  if(allNegatives(night_1)){
    night_1[1].play();
  }
}
if(act == 2){
  if(allNegatives(night_1)&&allNegatives(day_1)){
    day_1[1].play();
  }
}
if(act == 3){
  if(allNegatives(day_1)&&allNegatives(night_2)){
    night_2[1].play();
  }
}
if(act == 4){
  if(allNegatives(night_2)&&allNegatives(day_2)){
    day_2[1].play();
  }
}

if(key == 'c'){
  if(act == 1){
    if(allNegatives(night_1)){
      night_1[2].play();
    }
  }
  if(act == 2){
    if(allNegatives(night_1)&&allNegatives(day_1)){
      day_1[2].play();
    }
  }
  if(act == 3){
    if(allNegatives(day_1)&&allNegatives(night_2)){
      night_2[2].play();
    }
  }
  if(act == 4){
    if(allNegatives(night_2)&&allNegatives(day_2)){
      day_2[2].play();
    }
  }
}

```

xi

```

}
}
}

if(key == 'v'){
  if(act == 1){
    if(allNegatives(night_1)){
      night_1[3].play();
    }
  }
  if(act == 2){
    if(allNegatives(night_1)&&allNegatives(day_1)){
      day_1[3].play();
    }
  }
  if(act == 3){
    if(allNegatives(day_1)&&allNegatives(night_2)){
      night_2[3].play();
    }
  }
  if(act == 4){
    if(allNegatives(night_2)&&allNegatives(day_2)){
      day_2[3].play();
    }
  }
}

```

```

}
}
if(act == 4){
  if(allNegatives(night_2)&&allNegatives(day_2)){
    day_2[4].play();
  }
}
}
}
}
}

```

```

if(key == 'b'){
  if(act == 1){
    if(allNegatives(night_1)){
      night_1[4].play();
    }
  }
  if(act == 2){
    if(allNegatives(night_1)&&allNegatives(day_1)){
      day_1[4].play();
    }
  }
  if(act == 3){
    if(allNegatives(day_1)&&allNegatives(night_2)){
      night_2[4].play();
    }
  }
}

```

Time	Personality Setting	Translated transcription
Night 1	Totally Disagreeable	I know people that can keep to their own schedule a lot better. I am now saying that you should sleep at 22:00, but know that you are only wasting energy by not watching the time yourself for once.
	Slightly Disagreeable	I want you to go to sleep. It is 22:00.
	Neutral	Good evening, based on my data, it is good to sleep now. End your day and go to sleep.
	Slightly Agreeable	Hi. It is 22:00. It would be good to end the day soon. Take it easy and take your pyjamas.
	Totally Agreeable	Hi there. If I don't interrupt, I would recommend slowly ending your day. It is 22:00, the best time to start building your sleeping rhythm. But take it easy and look for yourself what suits you.
Day 1	Totally Disagreeable	Wake up, you lazy asshole. I can't keep saying this.
	Slightly Disagreeable	Step out of bed, lazy person.
	Neutral	It is 6:00. For a good sleeping rhythm, you should get out of bed soon.
	Slightly Agreeable	Good morning. For your rhythm, it is best to get up now. Enjoy your day.
	Totally Agreeable	Good morning. Have you slept well? You are well on your way to building a sleeping rhythm. If you are ready, I recommend slowly getting out of bed.
Night 2	Totally Disagreeable	Busy with your own business again and not giving attention to me, the time or your schedule. Don't you have anything better to do? Sleep at once.
	Slightly Disagreeable	If you keep staying up so late, you will never get a sleeping rhythm. It is almost 22:00. Go to sleep quickly.
	Neutral	I am here again. It is your bed time again. Go to bed.
	Slightly Agreeable	Hello. It is good to go to sleep soon. You are well on your way for a good sleeping rhythm.
	Totally Agreeable	Hello. I am here again. Slowly end your day, then you keep on working on your sleeping rhythm. But take your time.
Day 2	Totally Disagreeable	If you don't get up once more, I will stop helping. You are lazy, dumb and don't have any respect for yourself or whoever else.

	Slightly Disagreeable	Do I need to keep saying you should get up at 6:00? Get up now.
	Neutral	It is 6 a 'clock again. Slowly get up.
	Slightly Agreeable	Good morning without troubles. Get up easily to start the day off well.
	Totally Agreeable	The sun is rising. Will you also go out of bed? I find it nice to notice you are working well on your sleeping schedule.

C: User test 1 protocol + result + analysis

Handouts

The setup:

Data collected: photographs, voice recording, answers to the interview

Part 1: experience. (5 min p.p. // structured)

- Small introduction of the product
- User sets personality -> can change anytime
- Day and nights happen
 - Most talk happens through the script. I take over if they answer

Part 2: evaluation of the product. (15 mins total // semi-structured)

- 3 tools: MS product reaction cards, Geneva emotion wheel, UX curve.
- Supporting questions:
 - What made you choose these 5 cards?
 - What made you feel these emotions?
 - How are the emotions you felt connected to the interaction with the product?
 - What were the most influential factors of change on the UX curve?
 - How would you map the MS product relation cards in the UX curve?
 - How would you map your emotions in the UX curve?

Part 3: discussion about products as social actors (15 mins // unstructured)

- Guiding questions:
 - What made the prototyped experience with the product make you think about?
 - How does this interaction differ from the use of contemporary conversational agents?
 - When do you foresee products such as this being implemented in daily life?
 - Will products ever be considered as social actors?

Part 4: closing thoughts and thank you (5 mins // unstructured)

Toestemmingsformulier proefpersoon

Onderzoek Persoonlijkheid in AI: Slaapritme tool

- Ik heb informatie gekregen en ik begrijp waar dit onderzoek over gaat. Ook kon ik vragen stellen. Mijn vragen zijn voldoende beantwoord. Ik had genoeg tijd om te beslissen of ik meedoe.
- Ik weet dat meedoen vrijwillig is. Ook weet ik dat ik op ieder moment kan beslissen om toch niet mee te doen of te stoppen met het onderzoek. Daarvoor hoef ik geen reden te geven.
- Ik weet dat sommige mensen mijn gegevens kunnen inzien. Die mensen zijn Simon de Vries en Yaliang Chuang.
- Ik geef toestemming voor het verzamelen en gebruiken van mijn gegevens voor wetenschappelijke publicaties en meer of ander onderzoek op mijn gegevens.
- De verzamelde data zijn: mijn antwoorden op de vragen, foto's en spraakopnames.
- Ik geef toestemming om mijn gegevens op de onderzoekslocatie nog 15 jaar na dit onderzoek te bewaren.

Ik wil meedoen aan dit onderzoek.

Naam proefpersoon:

Handtekening:

Datum : __ / __ / __

Ik verklaar dat ik deze proefpersoon volledig heb geïnformeerd over het genoemde onderzoek.

Als er tijdens het onderzoek informatie bekend wordt die de toestemming van de proefpersoon zou kunnen beïnvloeden, dan breng ik hem/haar daarvan tijdig op de hoogte.

Naam onderzoeker (of diens vertegenwoordiger): Simon de Vries

Handtekening:

Datum: __ / __ / __

De proefpersoon krijgt een kopie van het getekende toestemmingsformulier.

Simplistic	Inviting	Clean	Irrelevant	Patronizing
Not Valuable	Approachable	Dated	Valuable	Consistent
Boring	Effortless	Comprehensive	Stable	Easy to use
Motivating	Compelling	Overbearing	Disconnected	Satisfying
Organized	Fragile	Accessible	Confusing	Useful
Fresh	Creative	Relevant	Impressive	Ordinary
Energetic	Not Secure	Low Maintenance	Stimulating	Enthusiastic
Empowering	Unconventional	Controllable	Exceptional	Predictable
Desirable	Comfortable	Impersonal	Business-like	Convenient
Effective	Difficult	Frustrating	Clear	Gets in the way
Powerful	Customizable	Hard to Use	Fast	Stressful
Time-Saving	Connected	Compatible	Calm	Undesirable
Attractive	Efficient	Poor quality	Inconsistent	Uncontrollable
Familiar	Overwhelming	Unpredictable	Complex	Confident
Unrefined	Rigid	Engaging	Annoying	Busy
Expected	Sterile	Advanced	Essential	Straight Forward
Unapproachable	Distracting	Meaningful	Trustworthy	Old
Intuitive	Cutting edge	Integrated	Unattractive	Intimidating
Time-consuming	Secure	Ineffective	Helpful	Too Technical
Optimistic	Personal	Exciting	Professional	High quality
Disruptive	Collaborative	Fun	Entertaining	Flexible
Inspiring	Slow	Appealing	Understandable	Incomprehensible
Dull	Responsive	Reliable	Sophisticated	
Innovative	Novel	Usable	Friendly	

Developed by and © 2002 Microsoft Corporation. All rights reserved.

XV

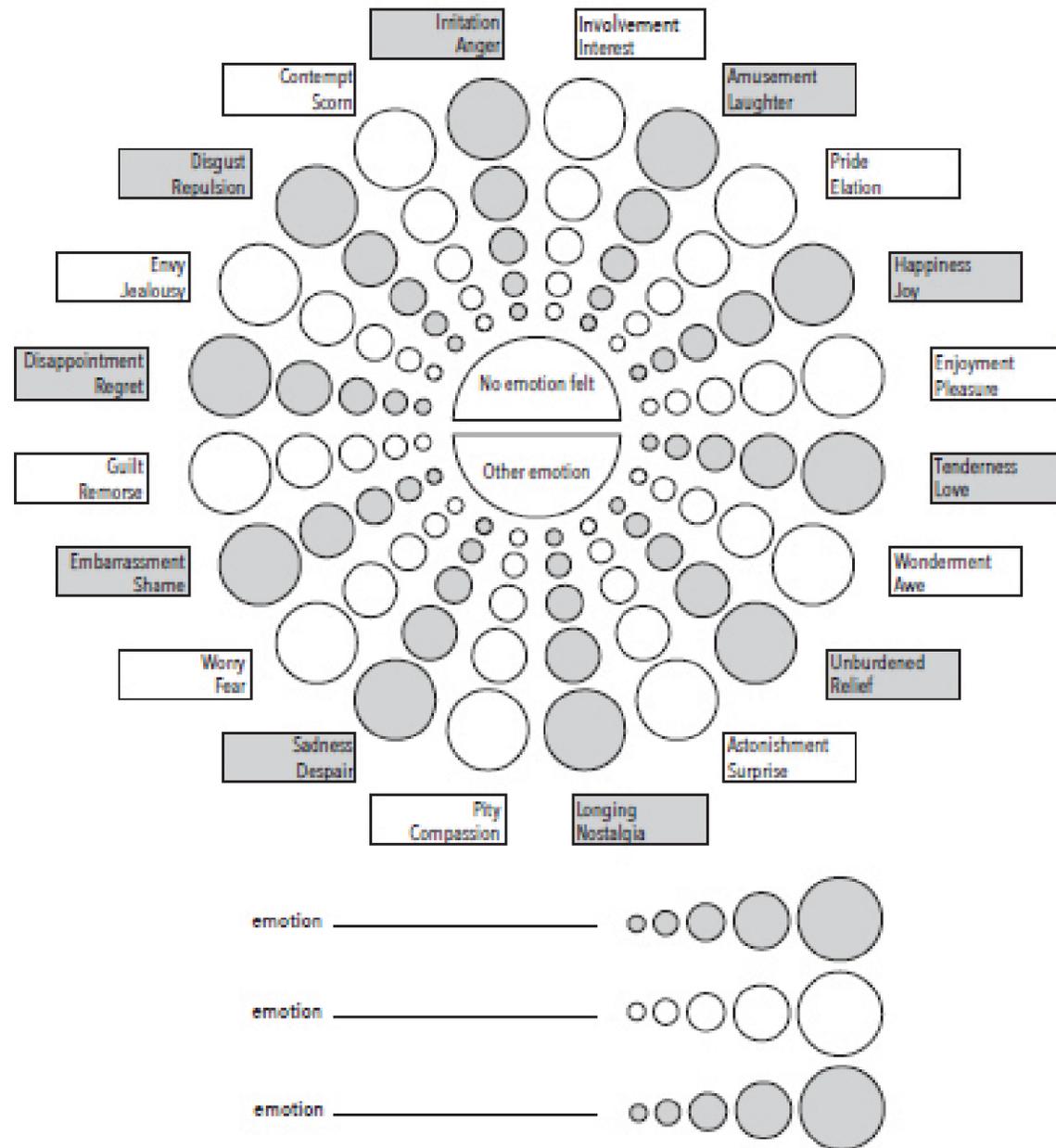
Your experience curve

Please recall the moment when you began to use the product / service. Draw a curve describing how your relationship towards the product has changed from the first time you used it until today.

Describe the reasons for the changes in your experience. Annotate each significant variation on the curve with a number and comment here.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

4. Please describe how you felt during the experience.



Results

Transcriptions interviews week 6

(8-10-2021 – 15-10-2021)

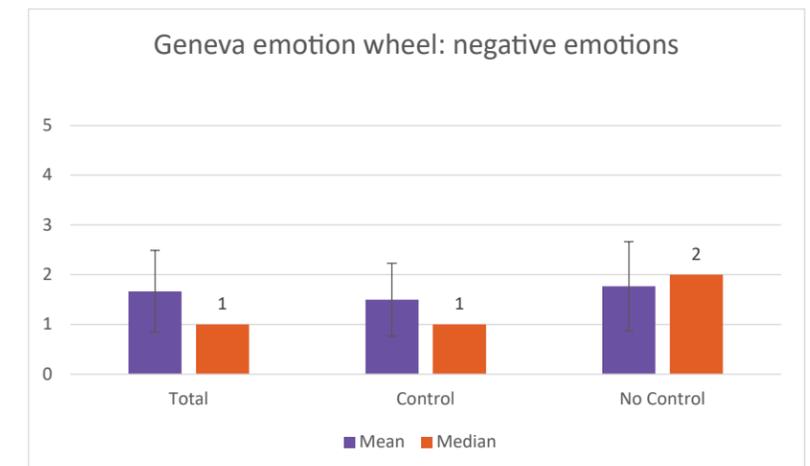
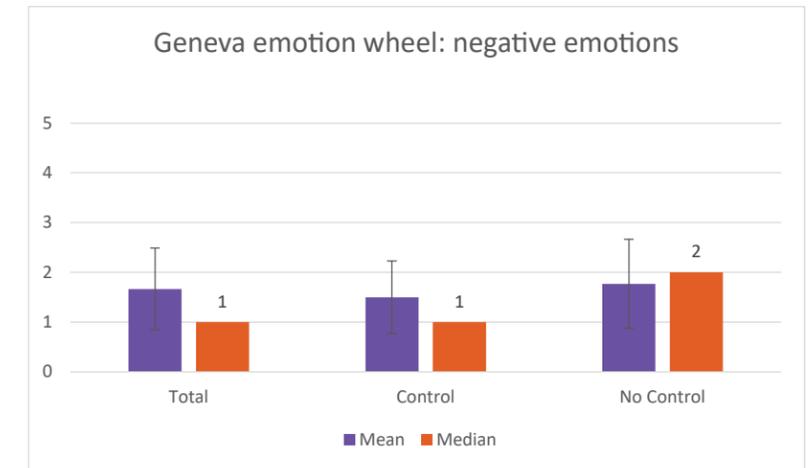
Microsoft Product relation cards: outcomes

card	amount chosen	explanation
Friendly	2	
Time-saving	1	
Approachable	1	
Stable	1	
Customizable	1	
Consistent	1	
Straightforward	1	
Fun	2	
Entertaining	1	
Stimulating	1	
Easy to use	2	
Compelling	1	
Empathetic	1	
Simplistic	2	Does what it needs to do, motive was clear
Gullible	1	Easily gives up (participant left setting at full agreeableness)
Desirable	1	
Helpful	1	
Accessible	1	
Integrated	1	Helps you automatically
Clear	1	
Usable	1	
Personal	1	
Impressive	1	

Geneva emotion wheel: outcomes

1 = not at all felt; 5 = fully felt

Title	Score - P1	Score - P2	Score - P3	Score - P4	Score - P5	Score - P6	Total	Mean
Involvement // Interest	4	3	4	3	4	4	22	3,67
Amusement // Laughter	5	3	3	2	4	3	20	3,33
Pride // Elation	3	2	2	1	3	2	13	2,17
Happiness // Joy	5	5	3	1	3	3	20	3,33
Enjoyment // Pleasure	5	3	2	2	4	3	19	3,17
Tenderness // Love	3	2	3	3	1	2	14	2,33
Wonderment // Awe	4	4	3	1	2	4	18	3
Unburdened // Relief	3	3	4	3	3	2	18	3
Astonishment // Surprise	4	4	2	1	4	4	19	3,17
Longing // Nostalgia	2	2	2	2	2	2	12	2
Pity // Compassion	3	1	3	1	2	2	12	2
Sadness // Despair	1	1	2	1	2	1	8	1,33
Worry // Fear	1	1	2	1	2	1	8	1,33
Embarrassment // Shame	2	2	3	2	2	1	12	2
Guilt // Remorse	1	2	2	5	2	1	13	2,17
Disappointment // Regret	1	2	3	3	1	3	13	2,17
Envy // Jealousy	1	1	1	2	2	1	8	1,33
Disgust // Repulsion	2	1	1	1	1	1	7	1,17
Contempt // Scorn	2	1	1	1	1	1	7	1,17
Irritation // Anger	3	2	2	1	1	1	10	1,67



Interview 1

Tuesday 12-10; 12:30 – 13:30; P1&P2

No voice recorded. Made notes

Notes

P1 kept the prototype at 4/5 agreeableness until the last night. Before they went to sleep on the last night, they set it to 1/5 agreeableness.

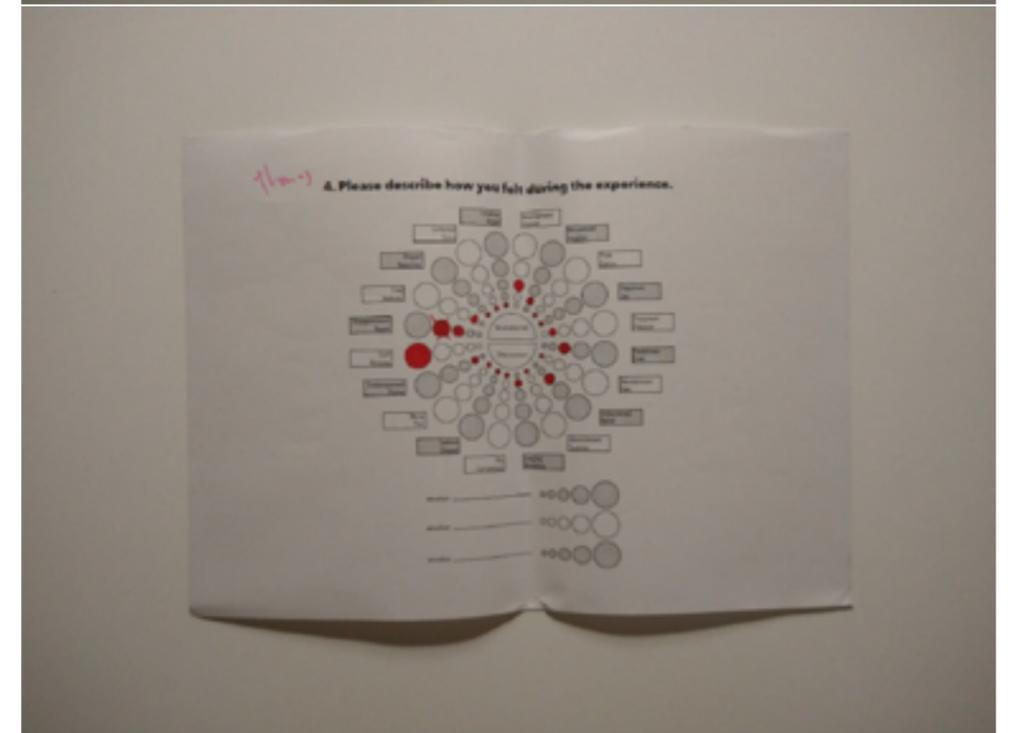
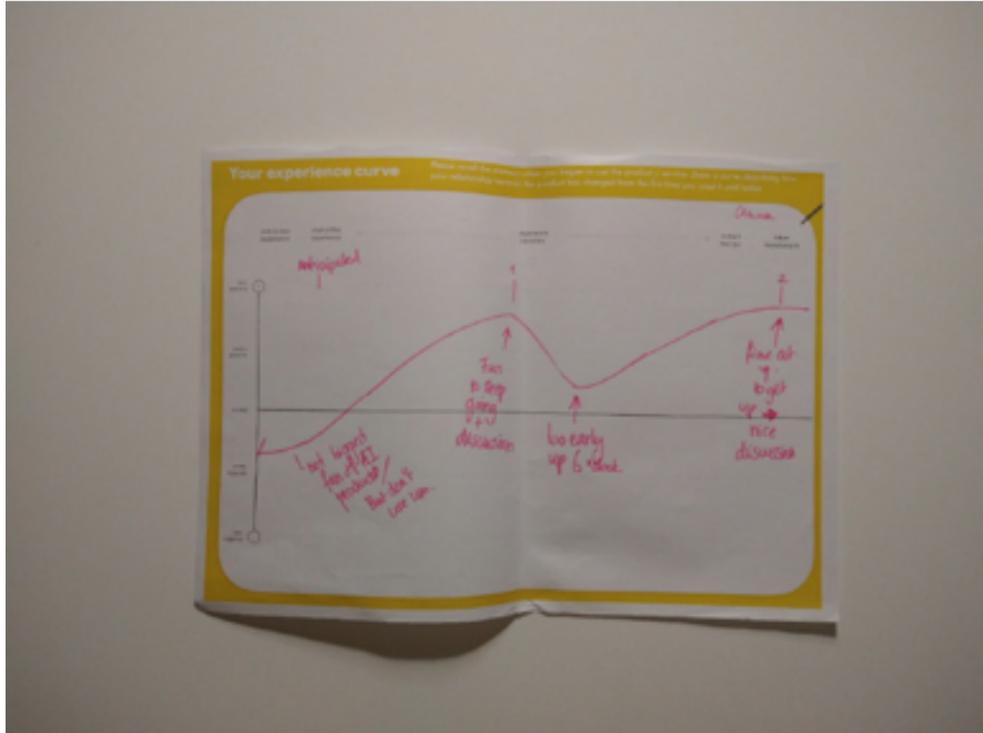
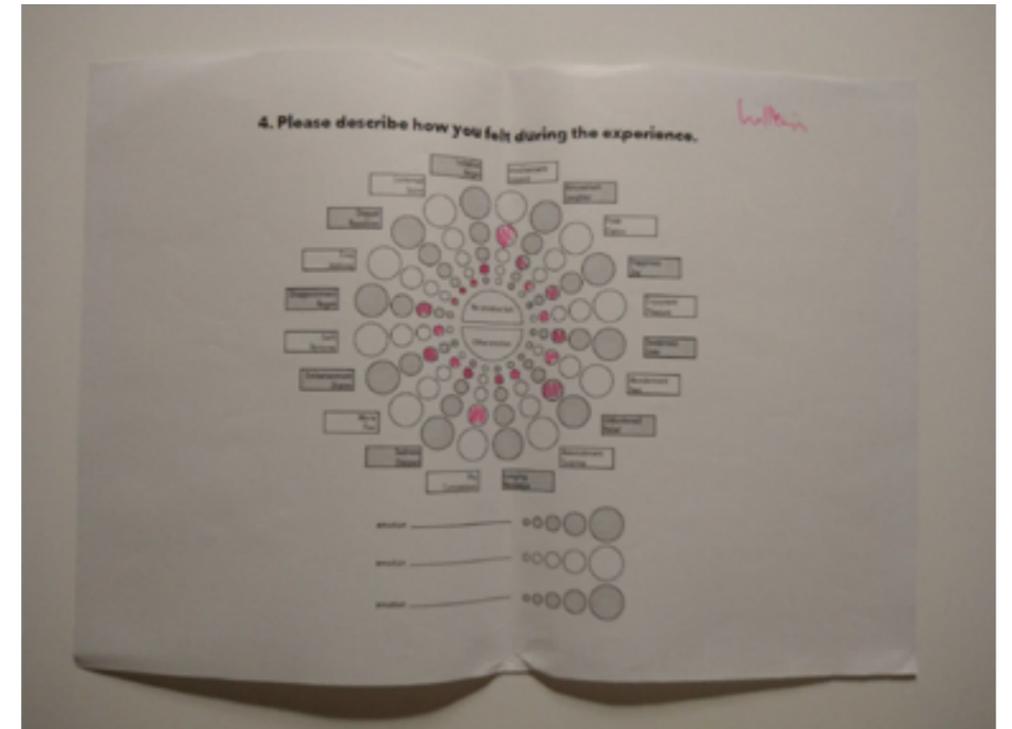
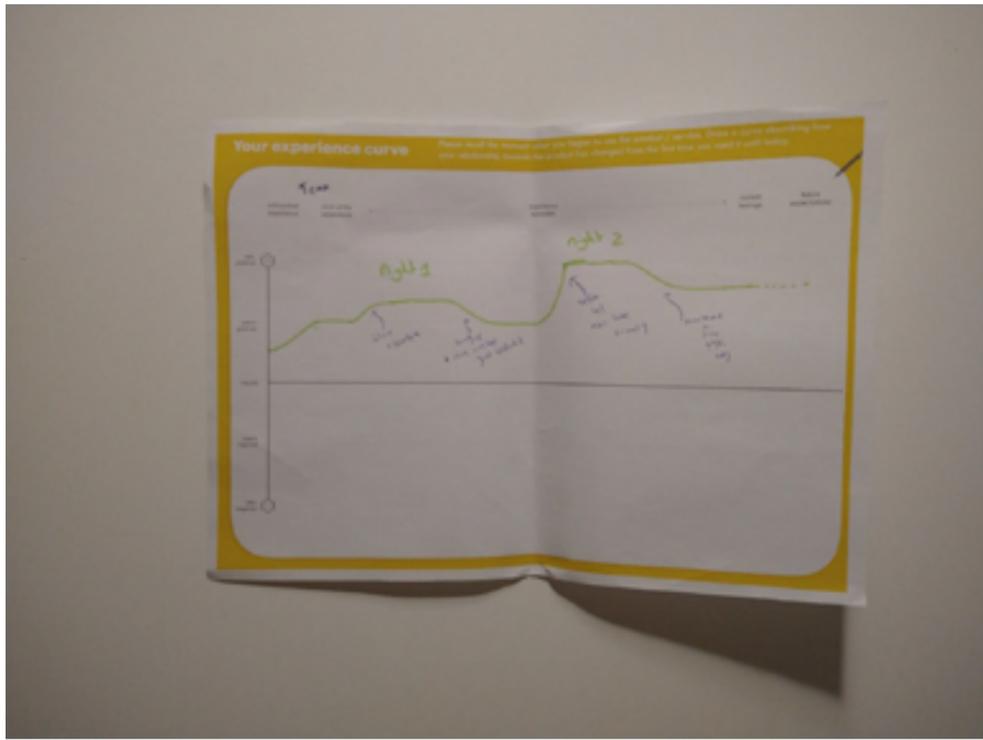
They felt like the device went really hard towards the negative when they switched the agreeableness. They felt like it should feel like someone is angry at you. That is also what they felt during this experience.

P2 kept the prototype at 5/5 agreeableness for the whole scenario.

P2 can keep their sleeping rhythm quite easily on their own. They would like to set the time themselves, as the rhythm proposed by the device did not fit their actual schedule.

We discussed what the feedback buttons should actually be about. An idea was to give feedback on if the product was helpful. If the product got a lot of negative responses, it could change the times or amounts of times it gives feedback. If it got positive responses, it knows to continue how it was doing.

So not about personality, but about the time and frequency settings.



xviii

Interview 2

Wednesday 13-10; 20:00 – 21:00; P3,P4&P5

No voice recorded. Made notes

Notes

P3 started the agreeableness at 3/5. After night 1, they set it to 4/5. Before the next night, they set it to 2/5 and then changed it back to 4/5

They were shocked by the harshness of the product at 2/5 and changed it back accordingly.

P4 steadily kept the agreeableness at 4/5

They wanted to change their sleeping schedule and got disappointed in themselves when they 'snoozed' the product by asking if they could sleep later.

P5 started the agreeableness at 3/5 and changed it to 1/5 after the first waking up

For them, a harsh alarm would help in waking up

During the product evaluation, people said the following:

P3: I don't know if I would do the same if I really had such a thing in my house.

P3: I'd rather it would help with going to sleep rather than suggesting a sleeping rhythm.

P5: I usually have difficulty getting up when I don't have any responsibilities for the day. I usually do everything to get an extra bit of rest.

P4: Same for me. I usually only have things to do in the afternoon.

P3: The product was simple because its motive was really clear.

P5: you are also going to experiment with the settings on your own. However, it should make sure you are experiencing all settings, no matter the costs.

P3: what if it calls my mom if I don't go to sleep. I would be shocked first time, but would call bluff the next time.

^ In that way, it would also have an aspect of gambling / social play

Maybe it connect to your calendar, so it can be more of a personal assistant

P4: I usually snooze to wake up. That is my wake up process then. I keep laying, but won't fall back to sleep.

P4: I also really like the smart alarm clocks that wake you up with light.

P3: Yeah! Then you can also connect it to your coffee machine to get the full package.

P3: It feels integrated → it helps you automatically.

P5: It works better by learning how it works and what it can do to get you out of bed.

P3: By giving advice instead of just naming facts, it gave something positive and personal

Context: the participant asked what the weather was. The device answered by saying: 'it is going to be approximately 13°, wear a scarf but don't wear too much. Otherwise you might get hot.'

P4: It feels bad to constantly ask if you can have some more time out of bed. Because it is AI, it will learn about your laziness. Asking it is like snoozing with a regular alarm clock.

P3: If I ever have to get up early, I awake way too early.

P3: my high-rated words in the Geneva emotion wheel are compassion, relief and involvement. It felt like someone was thinking with you, in that way sharing the burden.

P4: I mostly felt guilt → it felt bad to constantly delay waking up or going to sleep

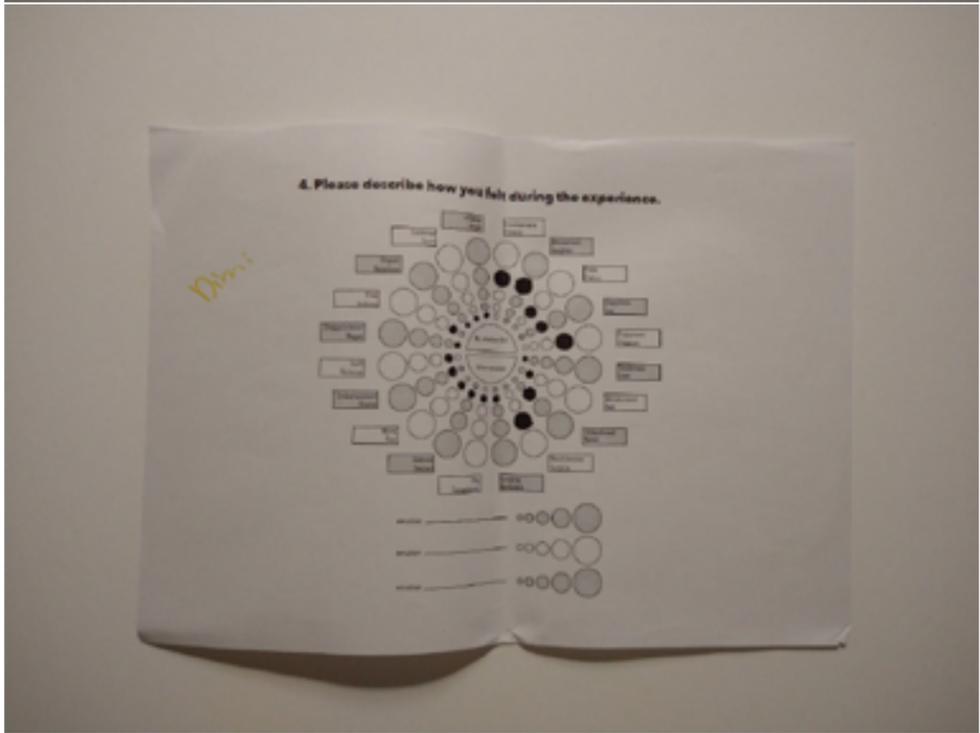
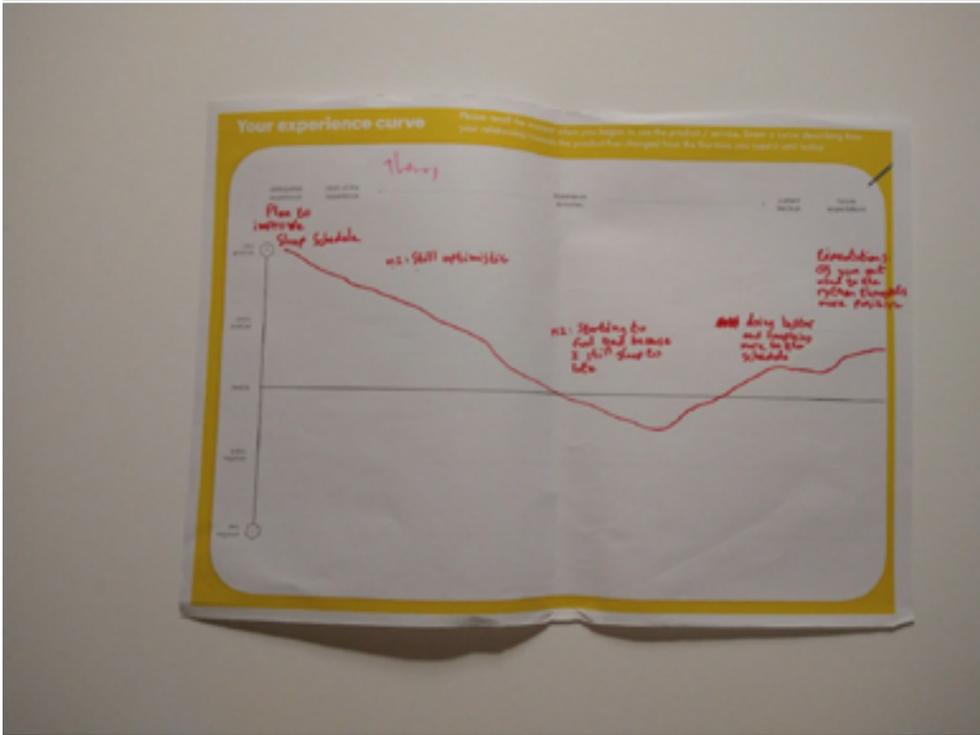
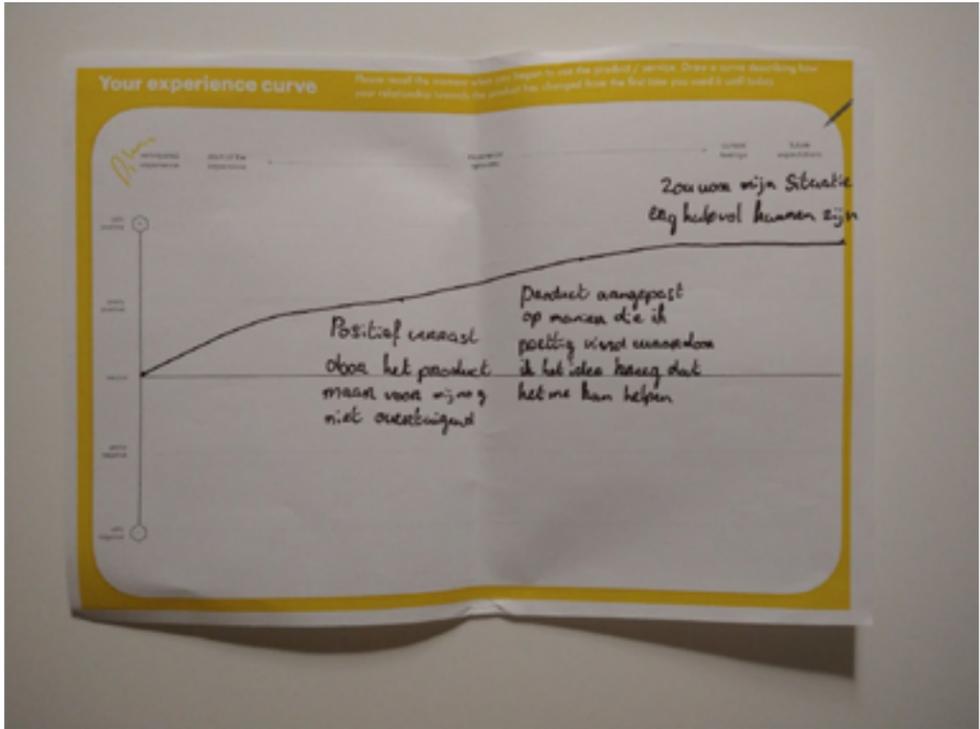
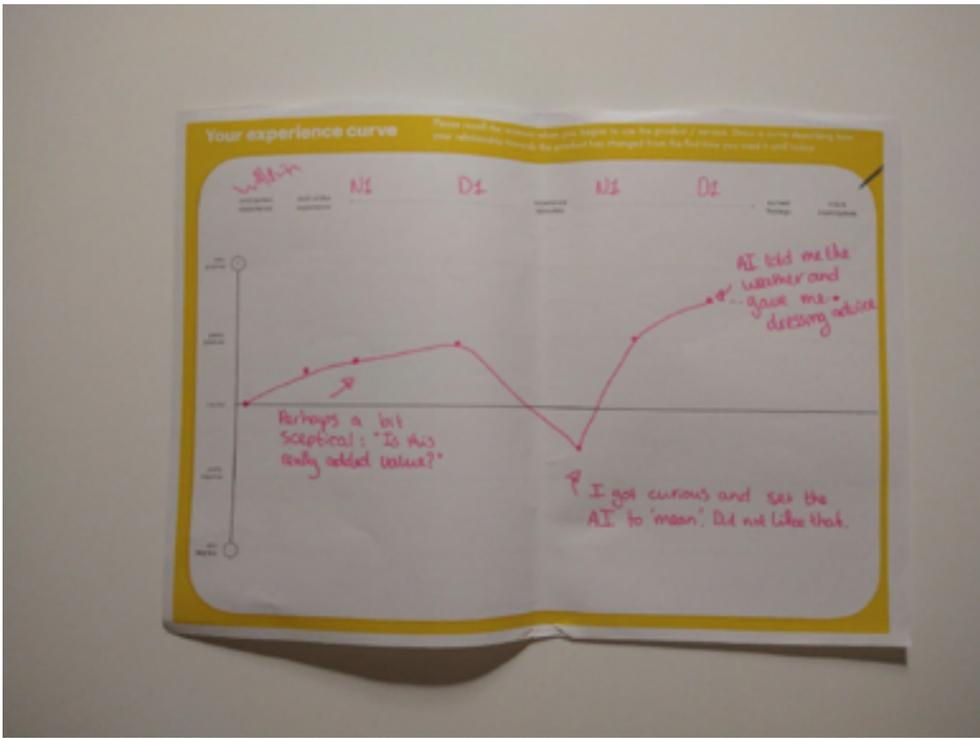
P3: I had a really sudden change in character when I changed the setting.

P3: I think because it is such an integrated product, it is best not to have extreme feelings about it. You have clear expectations about it. Then it is good if it just does what it needs to do. It could change adjust better by being subtle. Research and explore the product. And then you can adjust it.

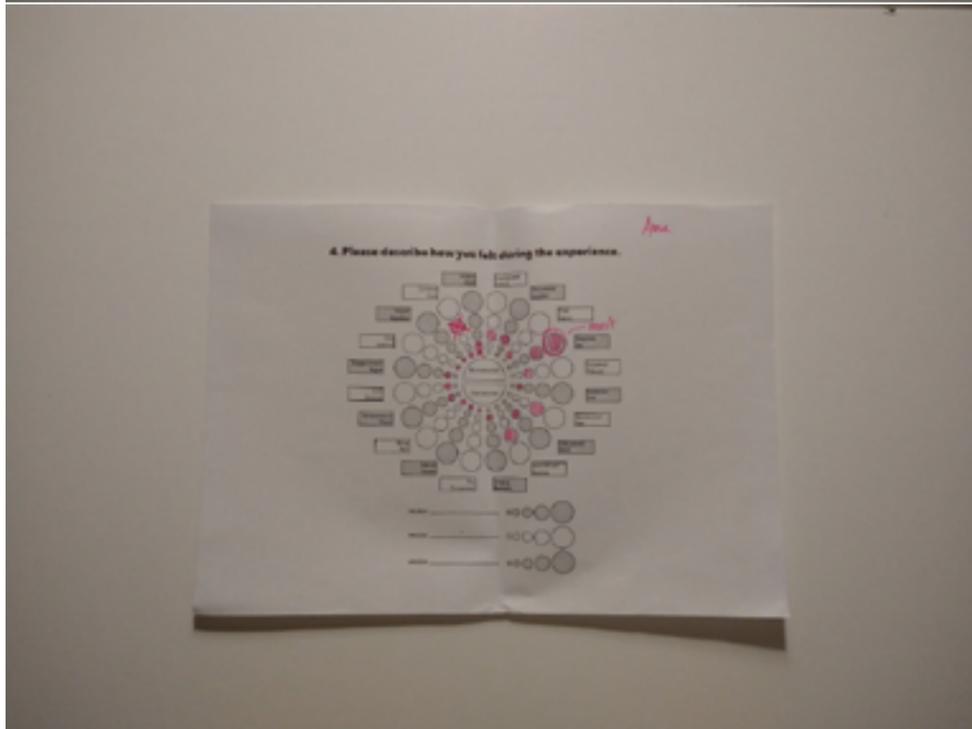
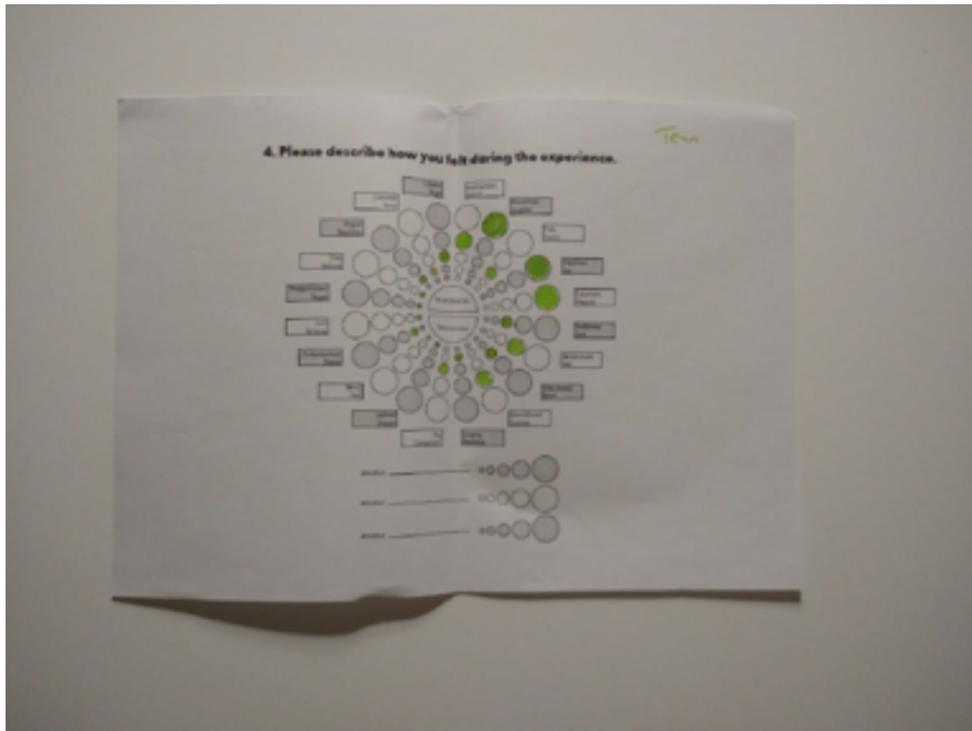
P3: I envision something like the parrot effect happening: you teach it your habits and because of that, it annoys you more and more. It starts to look like you so much.

The product did not make people think about personality in AI or AI as social actors that much.

xix



XX



Interview 3

Thursday 14-10; 9:30 – 10:30; P6

Voice recording & notes made.

Notes

P6 started the device on 5/5 agreeableness. Before night 2, they changed it to 2/5.

Quotes:

"I understand it very little. I do find it very cool that there is an actual entity talking to you. I don't know if I can make that".

The participant did not talk to the device much

About usability: "you need to get used to talking to the device. Once you are, it is nice and easy to use."

"I understand AI better through this product."

"It is personal that it talks to you and observes to serve your own rhythm. I do feel I have control over it."

The Geneva emotional curve was a bit towards the middle

"I am neutral about the product. The experience did not make me think a lot about personal experiences and emotions."

"Changing the settings for yourself causes a sense of personality. Being able to change it is comfortable. The personality feels more real that way. This one also has a normal voice"

"I like that it's a smiley. It is a good design."

I asked how the participant would redesign the product

"Have you thought about the use of material? I would think about it, durability or recycled 3D printed material. I'd like it to have a softer material. Maybe you could make an expansion pack for that, so that you could change out the material."

It would be good to think about the production a material level, having a cocreation session on that.

I asked how the participant envisioned it would go on the market

"I think it will fare well on the market. Especially for children or lonely people. Children don't like being told when to go to bed by their mother. This might be a different way for them to do it."

I asked how it could be catered towards a bigger group.

"Maybe it could be implemented in an app, with a notification when you need to go to bed. Or it could be a function towards your phone: making it impossible to use certain apps when you set it to disagreeable or linking it together with other apps."

I asked whether the participant would want the product

"The device is really functional. I would not get very because of it. It could also bring disappointment to yourself if it makes you feel guilty"

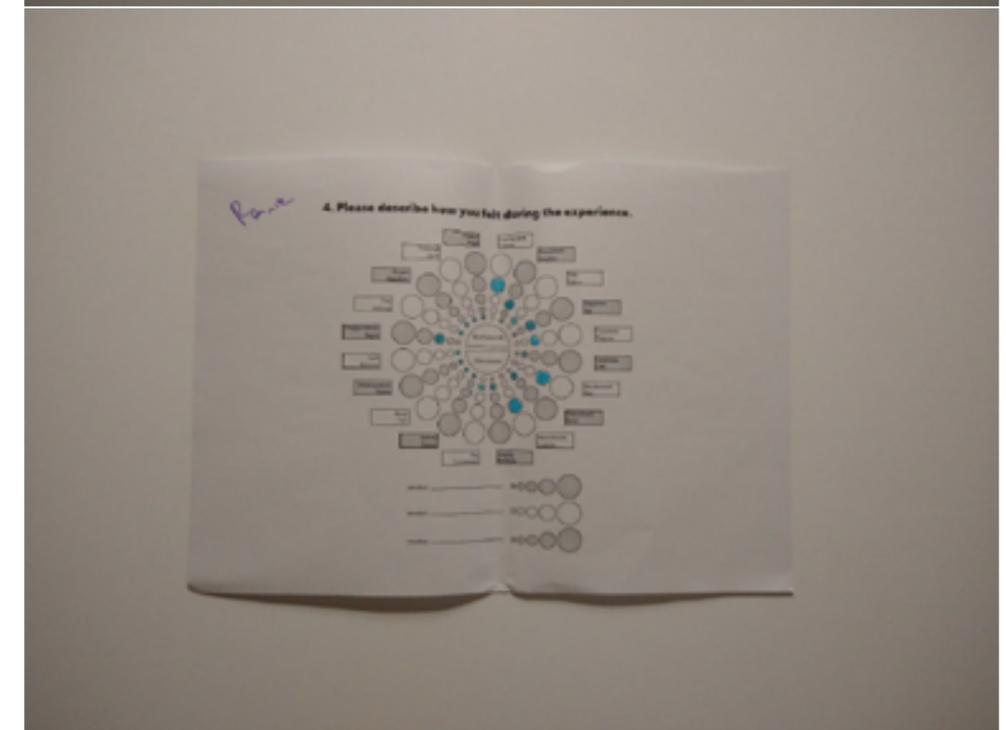
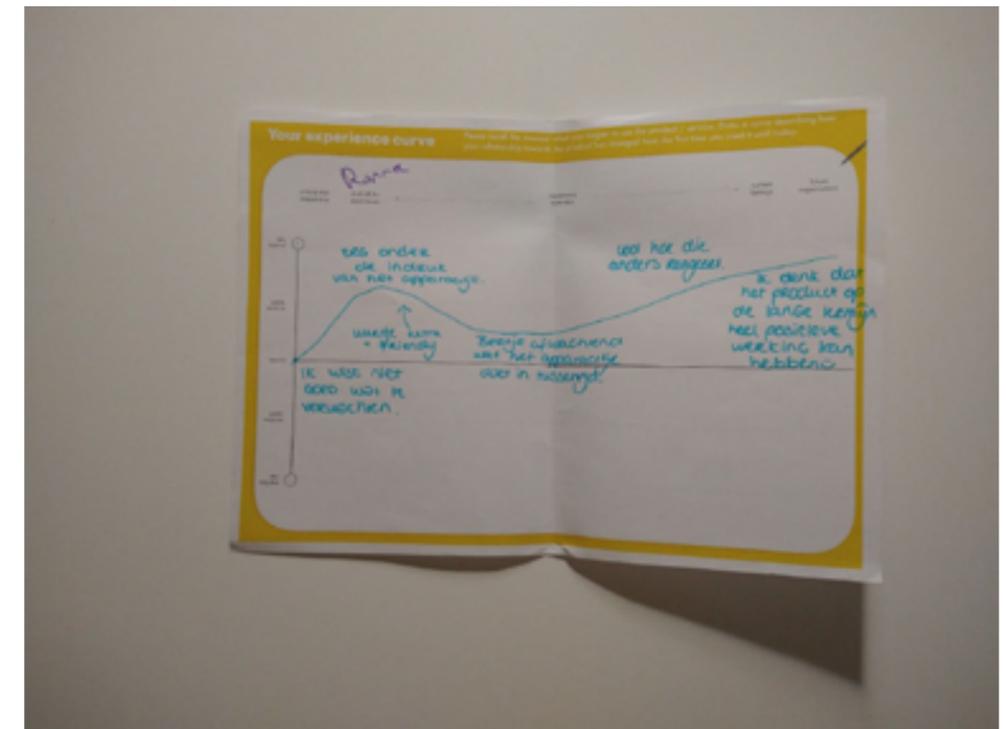
"I don't have any negative emotions about the product, really. I think it's good if it doesn't work on your emotions too much."

"I've always viewed Siri as more of a toy. With this product, because it is catered to you specifically, it is good not to play with it too much, but to keep steady emotions."

"The refreshment causes for a good user experience. If it keeps on doing the same thing, it will get boring and might work less well."

"Products with which you build a bond are nothing for me. It could be good for my grandma, so she would have someone to talk to."

"I'm not that much a technology/AI person. I like to keep things the same if they work and am a bit apprehensive about new things."



Transcription

R	I have three tests. Firstly a box with words. They are quite a lot so you don't have to view them all. However, I would like to ask you to choose the five words that fitted the experience best. You don't have to arrange them per se. I'll tell you what the next step is when you're done with that. In the meantime, I will start cleaning up the setup.
P6	So the avatar is in Dutch, but this is in English? Did you do that consciously?
R	That's true. Well, kind of. This list of words is developed by Microsoft. It is a proven method. If I were to translate it, it probably won't be valid anymore. If it's a little confusing, you can always ask.
P6	Oh, no worries.
R	The product talks in Dutch because that's a bit closer to the participants.
P6	A yeah, of course.
R	Do you use voice assistants from time to time yourself?
P6	No, I am a-technical as can be. No, I do everything by hand.
R	I think that has something as well. Maybe that's good.
P6	I don't understand - I have one of those google boxes now. I am amazed that I can do that.
R	One that turns on your lights and such, or...
P6	O, no not even that. Just one for my television that I can connect to my phone.
R	Ah, Chromecast!
P6	Yeah, Chromecast. I think it's cool that I can do that.
R	Yeah those things are chill. You just have to connect it and then it works immediately.
P6	Exactly!
R	And things like Siri and such? Or is that not really your thing?
P6	No, I find it very nice that I have Siri. But for me it's unnecessary.
R	I understand.
R	So you find it nice to have, but more with the idea that just in case you ever want to actually talk to your phone, it's possible?
P6	Yes, precisely. It is very nice that it's possible and I find it very good if other people can get some benefits out of it. But for me, it doesn't need to be there.
R	I see.

R	For you, would a product like the one I'm making - that automatically creates sleeping things -... Would you rather do that by hand?
P6	Uhm.. yeah, I do think so.
R	Yeah, I understand. And how come?
P6	Uhm, I find new things very scary. So - and because I am super clumsy, I think I'd rather keep things that are new a bit away from me.
R	Aha. Also with that if you ever use it in the wrong way and something goes wrong, you have more control over it if you do it your own way?
P6	Yes exactly.
R	Chill.
R	O good, I see you have finished!
P6	Yes!
R	I'll roll up the mat quickly. Yes it is in. Good.
R	What words did you choose?
P6	Innovative, Friendly, Personal, Usable and Impressive.
R	Cool! What made it so usable for you?
P6	In the beginning it was indeed a bit of getting used to with talking to the thing. But I think that if you understand it, it could just be a nice apparatus indeed. It is indeed just very user-friendly, that you can push it to the empathetic side or not. And that you can immediately talk to it. Also for a-technical people such as me, this would be easy to use.
R	Yeah, okay. Good to hear. And do you have the idea that you would understand AI better by using the product? Because it ...
P6	Yes, I do think I would. I have never had a good idea of what it is indeed. But with such a thing, I understand better what way the questionnaire [used to recruit participants] was going.
R	Yeah cool. Basically it's that it analyzes the things and creates it's own things based on that. And also the personality and how it reacts. It's very complicated, but basically: training a model and then it does something haha.
P6	Yeah, great!
R	And we already talked about the impressive a bit: that you found it so cool.
P6	uhuh.
R	And uhm, what did you find so personal about it?
P6	Yeah, because it talked to you, it felt very personal. And that it observes and builds your own rhythm. That it creates things based on that. That's what I think. And also

	because you can tune it like that, how it talks. That makes it more pleasurable for everyone.
R	And do you also have the feeling that you have some control over it?
P6	Uhm, yeah. Actually yes.
R	I pose way too leading questions, I believe haha.
P6	Oh no, no worries. Or I don't know if it is troublesome.
R	Well, it's fine. Nice! Then I have the following assignment. That is an emotion wheel. The print quality is quite bad, so it is possible that words are badly readable. But basically, yeah, there are emotions on it, on an axis from positive to negative. And that you have control over it versus you don't have that. And all on a scale of one to five how much you felt that emotion. If you could fill that in, that would be amazing. I will also keep one with me so I can tell you what everything says.
P6	Okay so uhm. For example here you see amusement / laughter. I should take these words together then?
R	Yes. They should be sort of synonyms of each other.
P6	And what do you mean with pride/elation?
R	That you felt proud while using the device. Elation is <i>opluchting</i> .
P6	Alright.
R	Do ask if you can't read or understand something.
P6	Beneath tenderness / love, it says wonder...?
R	Wonderment and awe. Sort of the impressive. The WOW factor.
P6	And there it says unburdened?
R	Yeah, unburdened and relief. No one can read that one. That you did not feel forced to do things.
P6	And contempt? that's this one.
R	O yeah, good one. What is that again? I'm going to look it up. It's a word with a fairly specific meaning. Contempt... <i>minachting</i> .
P6	And then, should I do something with these ones? [the other likert scales on the page]
R	No, unless you really felt one emotion that was not there, or did not feel anything at all.
P6	Uhm. No, there's nothing I can think of.
R	Cool! What did you fill in?
R	So it's all quite in the middle. Do you know how come?

P6	Uhm. Maybe because I am still quite neutral in the whole matter. And I think indeed that such an apparatus is not for amusement or something. It is more function-directed. And however cool I might find it, I think I will be able to get very little happiness out of it. On the other hand I find it very difficult. For example, I put disappointment a bit higher. Because if you set it to the minus and the thing says you just have to get up, you feel some disappointment towards yourself or so? Uhm. On the other hand, I found that tenderness / love would count as well. Because if it is at one time like "Okay, take some extra time to have a nice sleep." That does feel [tender and lovely]. So I put that one on the second circle. But it is very dependent on how you tune the device. Because it could get to the fourth circle on the right settings.
R	Exactly, so it's also what you make of it yourself. Funny! And you also talked about disappointment. That you would be disappointed in yourself if you set the device more towards the minus. Is that because it would talk you into feeling guilty, or...?
P6	Yes, that.
R	Okay. Do you have another emotion of which you find you have something fun or interesting to remark about?
P6	Well, just that I did not have any negative emotions about it really.
R	That's always good to hear. Haha.
R	And do you think it's good that it is so functional rather than really working on your emotions? Or uhm, how would you make that?
P6	I actually think that is good, yeah. Uhm. Mostly because it's so tuned to you. You would play with it less. Like we just talked about Siri. I have always seen that more as a toy. Not as something functional. And I think that this is more functional. If you would go and play with this, it would maybe get messed up or something.
R	Ah! O yeah. And I guess also because it actually does something for you. And also in the long term or something?
P6	Yes exactly, for that reason.
R	So in that way, it also is good that it steadily and calmly gives information?
P6	I think - yeah - for me it is.
R	Okay. Then I have the latest test or - what do you call it -paper here. That is an experience curve. On this axis you can plot how positively or negatively you felt. It starts with anticipation, so how you expected to feel. Then you have the rest which you can split in the two days. And afterwards you have the future expectations: how do you expect to ... yeah.
P6	And then with a curve?
R	Yeah, exactly.

R	O nice, you did that really quickly. Cool. Can you annotate at which points it changed and why? You can also do that for other parts.
R	Do you want water in the meantime, by the way? Then I can get that.
P6	No, I still have some so I don't need it, thank you.
R	I'll grab a glass of water. Be right back.
P6	*shows the paper*
R	Hmm. Nice. Chill. Haha. Very clear indeed. <i>So by discovering how it works, your curve got influenced? If you discovered something new, it went up, right?</i>
P6	Yes, yes.
R	Cool. <i>Do you think that would mainly be there for the first two days and afterwards fade away a bit? Would something new cause such a positive experience, or would it rather ... How do you think that would influence your experience, if it would stay renewing?</i>
P6	If it would stay renewing, it steadily would stay high. But if it would stay on the same level, I would be more neutral in the matter. It would be a good daily thing. But I am always very impressed by new things. So if it would become a standard ritual in my day, I would become more neutral, but stay positive about it.
R	Okay, so it would just turn more towards neutral?
P6	Yes.
R	Yeah, so over time the device would also build a sort of bond with you through the conversation. <i>What is your opinion on products that can build a bond with you in an emotional sense?</i>
P6	I think it doesn't work for me, but it could be very helpful for other people. Take for example my grandma, who lives alone. She could in this way still have someone to talk to. But because I just am not the type of person for these kinds of things, so it would be difficult for me. Uhm. But I think it could indeed be experienced very positively for a lot of people. Also as a kind of helper that you have in your home.
R	Yeah, and that it helps not only functionally, but also in a pretty personal way.
P6	Yes!
R	<i>Okay, and you said you are not the type of person for that. How come?</i>
P6	Yeah I don't know. Just the keeping everything nice and normal. Also being a bit apprehensive towards new things. So for me it is really nice to have my own way of living. Almost autistically, I want to have it this way and if there were new things in my life I panic. I would now know what to do. And I have found my way of living now, you know. I would need to change that all. So for me...
R	So it's nice to keep your own things, and the things that work. What we talked about shortly earlier on.

P6	Yes, exactly.
R	And then about the emotions related to the curve. <i>How would you put the words and the emotions in the curve? Or do you think it is not really relevant? That's also possible.</i>
P6	I think it is relevant. But I think the emotions and words I chose are applicable all throughout the curve. And especially the usable and friendly, it was here [at the start, <i>uurtje extra = friendly</i>] when I said that I wanted to sleep for one hour more.
R	<i>So that it reacts on your requests? That that gives that peak a bit.</i>
P6	I think so, yeah. And here [more towards the end end, <i>cool hoe die reageert</i>] the curve goes up because I found it impressive. But I think these words are applicable all throughout the curve.
R	So they are steady all throughout the curve.
P6	Yes
R	Good! Then for the last part of the interview. The product should of course monitor your sleeping schedule, but next to that, it has a second function that it should make people think about personality in products. And do we actually want that? And how should we treat our products once they become social, let's say. <i>Did the experience spark some thoughts about this?</i>
P6	Uhhh, not really. But I think, like I just said. That for one person this might turn out very well, such a personal experience and emotional apparatus. And that others would not at all agree with it. Because, yeah, you hear a lot more often that robots are rising and taking over the world. Uhm. I think it's really very cool that it is possible. So on my part, I have absolutely nothing against it and think it could have a positive influence.
R	So you would then be neutral but a bit towards the positive side [of the debate].
P6	Precisely, yes.
R	And uhm. <i>How do you think that changing the personality of the device would lead to a difference to, for example, Siri or another so-called conversational agent?</i>
P6	You can tune it to what you want yourself. Siri is really tuned to what it already finds on google and what it already can find on my phone already. But indeed, this device that is tuned to me and ... that is a lot more personal, actually. Because your phone goes in the direction that you want yourself anyway. And the device is like "you just have to get up. It is six a clock. Get out."
R	And you are not for this nor for Siri of course. But <i>what would you find most comfortable? If it actually is as impersonal like Siri, or would you rather have it adaptable, that you can make it personal?</i>
P6	I would rather be able to tune it and to have it personal.

XXV

R	And is it mostly because it is personal or is there another reason why it could be nice?
P6	I think mostly because of the personal. That it feels more real. In my opinion this one has a more normal voice than the girl I hear through my phone. It feels more robot-like out of a phone. And also because this one has a smiley.
R	Hahaha, oo does that help? That is quite nice.
R	Yeah actually, because you also have studied spatial design. What do you think of the design of this product? I deliberately kept it very simple.
P6	I find it really cool actually. Because is this 3D printed?
R	Yeah. And I actually forgot to explain one functionality. Because these minus and plus, they are both indicators for the setting. But at the same time, it is a way of giving feedback. So if you think it created a bad rhythm for you, so if you are sent to bed too early or too late or I don't know, you can press the [minus] button. And if it does it well, you can press just the other button. What do you think of that? [the feedback mechanism]
P6	I find it very nice. I like smileys in general. It has both a functional and .. it just looks nice in a home, or wherever you want it to be. It does not say where it needs to be anyway. I find the design very funny and very simple yet it works well.
R	Cool, nice. And through the simplicity, you think it would work anywhere, or?
P6	Yeah it is very easy. I think even my grandma of eighty, if you would tell her that you press the minus if it is arranged badly and the plus if it is arranged well. My mother would also understand it, and my niece of eight would also understand it. So I think it is very easy for anyone. If you would add a lot of extras, that ...
R	Yeah true, that would only make it complicated. Chill.
P6	Yes, yes. So the design is just very easy, looks nice and is usable.
R	So well-functional but also beautiful?
P6	Yes
R	Alright! As a designer that is the best thing to hear hahaha.
R	If you were to redesign it. How would you do it differently?
P6	Uhm..
R	If there really needed to be changed something. If your boss would say: 'this needs to be different.'
P6	Yeah, have you thought about use of materials?
R	Well, not really actually. So that is a good point of improvement!
R	How would you apply materials?

P6	Well, nowadays it is all about durability and recycling. So last year I did a project with recycled 3D printable materials. So.. 3D printing is very easy of course, so I would maybe use recycled 3D printable material
P6	Or I don't know of what you would otherwise make it? This is your prototype?
R	It is a prototype, yeah.
P6	Yeah, you just have a lot of things from recycled PET bottles. They do things with recycled jeans. But that is more fabric.
R	But you do stay in the plastic in that way. Do you think plastic is a good material for this or would you rather use another material?
P6	Yeah, maybe some softer material. That you have different options. Because some people have a really tidy interior. And you have the boho.. and all out colors. So maybe that you would be able to change the material and color or something.
R	A that is cool! Or, yeah! Because I had the idea in general to – I kept it simplistic because of that – I had the idea that if you keep it very simplistic, you evoke that people make their own thing with it. It would be really cool to me I I could make this so that people can make their own thing out of it, let's say.
P6	Yes! Or that you indeed create a sort of expansion pack of materials that people can stick to it. Like Velcro. So that you can change what is on it. Maybe you have pink fluffy on it one day and the other day, I don't know, carbon or something.
R	A yeah, chill cool. Now I am thinking that maybe it is nice to have some sort of cocreation session next time so that we can look at material and stick things to it and such. Would you like doing that, together with some other participants? Then we can think about the product, but more on a material level.
P6	Yeah, I think that would be very cool.
R	Alright, cool. Then I will think about it and send an email.
R	Cool, nice. I think we have had our questions then. It is cool to see that – the product was originally intended to stimulate the debate and it is not very good at that. But it is good to see that you see very direct use in it. That is cool. Do you think it would work if this product would enter the market?
P6	Yes, I do think so. I do think that firstly children or indeed for lonely people. I mean for example my little brother would never have listened to me to go to sleep. But if you have something like this hanging in your room, that is also fun for children. That it is not per se a father or mother that says that you need to go to sleep. Every kid knows that. You don't listen to them. If you have such a device that tells you to go to sleep, that's also a new experience for a kid. Maybe it's good to put the focus on that, and that later other people see that it actually is chill, and that they would like one too.

R	Yeah! And it is also pretty individual: it is really targeted towards towards one person. How do you think this could be able to work within a household or within a student home or ...?
P6	Well I think student home a little less because everyone has a different schedule. Also if I look to myself. One day I lay in bed broken at 21:00 because the three days before I ended up in bed at 4:00. If an avatar would tell me to sleep at 22:00. That's fun but if I have just drunk a bottle of wine, I just won't. Maybe it is difficult. Like where would I put it down. Because at my home with me, if I am at home alone the whole day and the thing tells me to sleep at 22:00 okay. But in my bedroom, I am not there the whole day. And if you look at a whole household, that would be difficult too.
R	Yeah, the idea for now is that the thing hangs in your bedroom and that will be the main thing. But that it also if you're not home could send messages to your Facebook for example, or in another way could communicate with other products.
P6	Or an app or so. That if I sit here, I get a notification like 'hey it is bedtime'. Because I also have a lot of apps, like Duolingo is always after my ass. And then I'm like 'am I in the mood to learn those five words?'
R	Yeah! And I always just don't do it for five days then and then uninstall the app. Hahaha. But how do you do that?
P6	Yeah I also ignore the app for two weeks.
R	You also have those memes that the bird is waiting in front of your house haha
P6	Yeah true! But.. I don't know because... uhm. Or indeed I have a function on my telephone that after a certain amount of time, I can't open apps anymore. Maybe you can link such an app to the settings. Because I think I also have that if I drink water and I put it in a certain app, it automatically goes through to my health app or so. And for example if I get a mail from a company with an appointment, it automatically gets put in my agenda. So if you could maybe automatically link it to such a thing, or maybe also you agenda...
R	O. Yeah. With agenda it is handy in general so that it can look at maybe you need to get up a bit earlier because of this or that.
P6	Yeah exactly. But in use, it would get a lot more difficult and also for my grandma of 80 who does not have a mobile phone, it would be difficult. But on a personal level it could make a difference. Maybe that you can change it yourself how personal you want it to be.
R	Yeah and exactly. And then it also goes a bit towards just as well setting your alarm yourself. And – I have to have an interview about this next week – I think the power of a good schedule is also that it is simple and tidy and that it does not adapt too much to differences in a situation.
P6	Yeah that's true.

Thematic analysis

What did people think of the user experience?			
Themes	Code	Participant	Subtheme
Vision of use	I'd rather it would help with going to sleep rather than suggesting a sleeping rhythm.	P3	Other part of sleep
	it should make sure you are experiencing all settings	P5	Predefine settings
	I think it could indeed be experienced very positively for a lot of people. Also as a kind of helper that you have in your home.	P6	Other use
	if you have something like this hanging in your room, that is also fun for children.	P6	User group
	If you have such a device that tells you to go to sleep, that's also a new experience for a kid	P6	User group
	I think [bad sleep] is a big problem, that many people can benefit	SE	Useful
	That would be beautiful, if it learns from [feedback on last night's sleep].	SE	Learns
	[Psychology and cognitive behavioral therapy] are expensive and intensive treatments. Those can be tackled through things such as this.	SE	Other use
	there are also things for cognitive behavioral therapy. There are questionnaires and online psychiatrists. Those kinds of things you can also integrate with this.	SE	Other use
	Maybe it is difficult [when you are not always home]. Like where would I put [the device] down	P6	User group
Usability	The product was simple because its motive was really clear.	P3	Simple use
	It is indeed just very user-friendly, that you can push it to the empathetic side or not	P6	Interaction
	Also for a-technical people such as me, this would be easy to use	P6	Simple
	And also [it is a nice experience] because this one has a smiley.	P6	Look
	My mother would also understand it, and my niece of eight would also understand it	P6	Simple
	I would mostly not make it more difficult [to use] than it is.	SE	Simple use
	You immediately see what you need to do when you see it.	SE	Interaction
Learnability	it just looks nice in a home	P6	Look
	I find it beautiful to see	SE	Look
	It works better by learning how it works	P5	Learn to use
	it was indeed a bit of getting used to with talking to the thing	P6	Learn to use
Personal	Yeah it is very personal indeed. And that is the good thing with an AI that it can look at what people want	SE	Learns user
	[It works better if it learns] what it can do to get you out of bed	P5	Learns user
	By giving advice instead of just naming facts, it gave something positive and personal	P3	Personal is nice
	Because it is AI, it will learn about your laziness.	P4	Personal is confronting

	It felt like someone was thinking with you, in that way sharing the burden.	P3	Personal is nice
	it felt bad to constantly delay waking up or going to sleep	P4	Personal is confronting
	you teach it your habits and because of that, it annoys you more and more.	P3	Personal is confronting
	because it talked to you, it felt very personal.	P6	It feels personal
	[having the possibility to tune the way it talks] makes it more pleasurable for everyone.	P6	Personal is nice
	If you would go and play with this, it would maybe get messed up or something.	P6	Personal complicates things
	this device that is tuned to me and ... that is a lot more personal, actually.	P6	It feels personal
	I think [this experience is nicer than products like Siri] mostly because of the personal. That it feels more real	P6	Personal is nice
	It is good that it thinks with you about the sleeping times	SE	Personal is nice
Practical			
	it is good if it just does what it needs to do.	P3	Functional is positive
	It is more function-directed [than for amusement or discovery].	P6	Functional is positive
	I actually think that [it is functional rather than emotional] is good	P6	Functional is positive
Would like to use			
	I do think [I would rather set the wake up and sleep times of the product by hand]	P6	Would not use
	however cool I might find it, I think I will be able to get very little happiness out of it.	P6	Would not use
Opinion			
	I did not have any negative emotions about it really.	P6	Positive
	So if it would become a standard ritual in my day, I would become more neutral, but stay positive about it.	P6	Positive

Did the product make people think about human-ai relationships?			
Theme	code	participant	Subtheme
opinion on ethics of future			
	I am still quite neutral in the whole matter [of personal AI]	P6	Neutral
	I think [building a bond with an object] doesn't work for me, but it could be very helpful for other people	P6	Neutral
	I have absolutely nothing against [the growing possibilities of AI] and think it could have a positive influence.	P6	Neutral
Control			
	R: you have more control over it if you do it your own way[, for if something goes wrong]? P6: Yes exactly.	P6	-

D: Expert 1 interview setup and results

Transcription interview sleep expert

19-10 13:30-14:30

Notes & Voice recording made

Setup

Questions interview sleep expert:

Semi-structured.

Goal: find out ways to help with sleep without directly measuring sleep.

-Intro: who am I?

- 1: Who are you? What is your expertise?

- showcase of current idea (same as interviews last week, just without the bedroom)

- 2: What do you think about the interaction/usability of the device?
- 3: What do you think about its behaviour: only notifying when you need to sleep or you need to get up?
- 4: What is important for a sleeping rhythm?
- 5: What are other factors - other than time - that are important for sleep.
- 6: What kind of people do you see often for problems with sleep?
- 7: How big is the problem?
- 8: Do you know any papers I can read to read up on the topic more?
- 9: What would you change about the product as it is now // If you would have designed it, what would you have done differently?

- Do you have any questions for me?

- Thank you very much!

Notes

Who are you? What is your expertise?

[Name Expert]; Lungspecialist.

Focus on sleep health/medicine and interstitial lung disease

First worked at sleep centre Ronne Heide

Collaborations with expertise centre on sleep complaints Kempenhage.

Mainly the medical side of sleep illnesses.

But also cures other sleep disorders, like restless leg syndrome

What do you think about the use or interaction of the product I made?

It is very easy to use. You can indicate your personality preference easily.

It is idiot proof.

It is good that it keeps your sleep schedule consistent

And that it thinks along with your sleeping times

It would be good to also consider sleep hygiene

For example: dim the lights if you go to sleep, or reduce screen use before sleep

What factors other than time influence sleep quality?

Times are important. On average, a person needs 8 hours of sleep, but it is very personal.

It is important to get in to sleep well and to wake up well as well.

Sleep hygiene → avoid blue light

- Avoid physical activity before sleep
- No caffeine-holding drinks
- No alcohol, it will interrupt your sleep
- Reading a book is better than watching YouTube before sleep
- There are things called whispering books, a bit like ASMR

Having calming sounds works.

The product might introduce personal calming sounds.

What kinds of people come to you often?

For sleep apnea, it mostly is people with overweight. They snore, which makes their oxygen levels fall throughout the day. These people fall asleep during the day easily. And also in trucks, which is problematic.

But I also see people with insomnia. They have problems getting in to sleep and lay awake too long. They can also awake very often throughout the night.

What can you prescribe people with insomnia?

xxix

For people with Apnea, I can offer tools, for example to hold their tongue back.

For insomnia, it depends on where it comes from.

Some people have always slept badly. But it can also change over time.

What are factors that can contribute to insomnia?

It is often a so-called 'life event'.

- A partner, father, mother, grandpa or grandma dies
- They lose their job
- They have a burnout

This causes worries.

To help, you can offer a listening ear, and ask through on the subject?

And are their medical factors as well?

Yes, for example restless legs or sleep apnea

And about sleep hygiene, people sometimes don't look it up or don't know about it

Sleep issues are often psychic, but I have to rule out medical reasons, like parkinsons or medicine that makes you sleep worse.

It is very important to find rest before you sleep and to know why you sleep badly.

Sleeping in when you don't sleep well shifts the sleeping rhythm as well.

What do you think is more important? Sleeping rhythm or the amount of sleep

I believe sleeping rhythm is more important.

Everyone has a circadian rhythm, caused by melatonin.

It is really a thing that people are morning or evening people.

And throwing around your sleeping schedule is not healthy.

A healthy sleep schedule can shift a bit, but let's say an hour around the standard sleeping times.

Age also is a factor: young people often sleep in easily while older people more often wake up in the middle of the night. That is because their melatonin clock works less well.

How big do you think the problem is?

I think it's really big. I don't have the exact numbers, but they must be somewhere on the internet.

I believe half of all Dutch people has some sort of sleeping complaint.

Some people also create a lack of sleep for themselves by going to sleep late and waking up early again for work.

Do you have some papers that are interesting for me to read about this topic?

Not on the top of my head, but I can surely find some 😊

What would you change, if you designed the product?

I think the concept is good → in terms of use, it should not be any more difficult

It is simple, it will work for the general public (normale mens)

You see what you need to do

It could, however, focus more on the things around sleep

- Give tips earlier on in the evening
- Help in- and through sleep issues

It could create awareness about sleep hygiene

It could give and ask feedback on how you slept: "why do you think you slept so well/badly?"

You can already change people's behaviour by talking to the,

For insomnia, people often go to the psychologist.

This is very expensive and takes a lot of time.

Having some questions and making people reflect can prevent a lot of sleeping issues already.

Ik moet nog dertien woorden schrijven om het 1000 woorden te maken en ik wil dat graag. Dus deze laatste twee zinnen waren eigenlijk nutteloos.

XXX

Transcription voice recording

R	It's recording. Who are you?
Sleep Expert	[Name Expert]. One of the pulmonologists here. Within Pulmonology we have a lot of subcategories or specializations. One of them is sleep healthcare. I do sleep healthcare for a big part. Next to that, I also do interstitial lung diseases, so that's a bit more rare lung diseases, like pulmonary fibrosis and such, and sarcoidosis.
R	It's called initial ...?
Sleep Expert	Interstitial.
R	I will write that down, haha.
Sleep Expert	Now I am working here for 7 years in the hospital. Connected to sleep, I have in the last year of my study, back then in the Catharina hospital, I have been in Ronne Heide for three months. There is also a sleep center. There I have laid the foundation of the pulmonology there. I work together with Kempenhagen. All recently, but we try to also tighten that bond. I believe they also do quite some research with you. Or the TU at least.
R	It did not sound very recognizable to me. What exactly is that?
Sleep Expert	Oh. Kempenhagen is really an expertise centre. If people have sleeping complaints, they can of course go to the family doctor. If there comes out - or the family doctor thinks about - sleep apnea, the doctor can send the patient through to the second line. That is the hospital. And if we really have people with difficult sleeping problems, or a combination of sleeping problems with epilepsy, or we can't treat the sleep apnea well, we can always send them through to Kempenhage. Then Kempenhage is sort of a third line centre, so they, they are ...
R	Really the expertise -...
Sleep Expert	Yeah they only do difficult to treat sleeping problems. So really the insomnias, difficult to sleep in, sleeping through badly, and hardly treatable sleep apnea.
R	Okay. Great! So you have - <i>mag ik u of jij zeggen?</i>
Sleep Expert	<i>Je</i> , please, of course!
R	So you have a lot of expertise on sleep actually, in that sense?
Sleep Expert	Yes, definitely. I must say that it ... within the sleep healthcare we are with pulmonology mostly on the ... -
R	Medical ehh..
Sleep Expert	Medical side. So also really sleep apnea. Obstructive sleep apnea and central sleep apnea. Really the difference is that with obstructive, you really have an obstruction in the air flow. And with central sleep apnea, the control of the breathing is not going well. You can then with a mask, CPEP, I think you probably have heard of it.. a little

	bit of Positive pressure, so people can wear a little mask and there is a device next to the bed that delivers that pressure on the air flow channels.
R	Which makes the airflow ...
Sleep Expert	Which causes the air flow channels to stay open well, right. So the basis of the tongue that falls back, that's where the problem often lies. So we do that a lot. But also the other sleep problems. So for example when people have trouble sleeping in, we can give tips for that. Eehm or people with restless legs and things such as that. Enfin. It all is part of it.
R	Okay. Yes. So the product as I made it, is indeed more target to just a general audience.
Sleep Expert	Precisely
R	So people that - yeah - have trouble falling asleep. Or generally find it nice to build a good rhythm / living healthily.
Sleep Expert	Yeah exactly. More the sleep <i>on sich</i> than the medical sleeping issues.
R	Yes, indeed. But I thought it would be really useful to interview you for that. I have a small demo of how the product works. I would like to show it to you. Then you have a little bit of an idea how the product works, and I can ask questions about it afterwards. It needs to start up... So in a while you will - like the product has already figured out a sleeping schedule for you, it will do that in two weeks -. And then you will experience two nights and two mornings. With that it really directly says: "hey you need to go to sleep". hahaha
Sleep Expert	Exactly
R	And with that, you can tune the personality. It will not take too long. Alright.
R	Imagine that this is your bedroom. This [the device] hangs on your wall somewhere. Tune the personality in the way that you think you would like it.
Sleep Expert	As I think ... well something like this. [4/5 agreeableness]
R	Good. It is evening. It's ten a clock.
Tool	It would be good to shut off the day in a little while. Grab your pajamas easily.
R	You can also talk to it
Sleep Expert	Alright. So I take my pajamas.
R	Alright. Ehm. Yeah.
Sleep Expert	Should I...
R	If you don't say anything, the product doesn't respond hahaha
Sleep Expert	Okay, so. (to tool) Good. I am going to grab my pajamas now.
R (as tool)	That is good. I hope you have a good night's rest.
Sleep Expert	Alright, thank you.

xxxi

R (as tool)	Yeah. Sleep tight. I will wake you up tomorrow at 6 AM.
Sleep Expert	Thank you.
R	So it turns .. yeah. You sleep.
Sleep Expert	Continuously in end. Hehe
R	In this instance we assume so haha. Okay. It turns morning.
Tool	Good morning. For your rhythm, now is the best time to get up. Enjoy your day.
Sleep Expert	Good morning.
R (as tool)	Good morning, [Name Expert]. Will you have a nice day today?
Sleep Expert	I have waken up nicely and have a full agenda.
R (as tool)	Good luck at your work. At least you have had a nice eight hours of sleep.
Sleep Expert	Thank you
R (as tool)	You can always change my personality if you want.
Sleep Expert	Okay
R	*humming* it turns evening again. The day goes on. It turns 10 PM.
Tool	Hello. It is good to go to sleep soon. You are working well towards a good sleeping rhythm.
Sleep Expert	Good that you say so. Thank you very much, that you remind me.. yeah. I will grab my pajamas.
R (as tool)	No problem. It is good that you follow my instructions.
R	So it turns day again. Evening. *humming*. Day.
Tool	Good morning without worries. Get up easily to start the day off well.
Sleep Expert	Okay. I will get out of bed again.
R (as tool)	Good day. Enjoy your day.
Sleep Expert	Thank you
R	Yeah. A bit like that indeed. In this scenario I said <i>U</i> a lot, but in reality [it would say <i>je</i> more]. And uhm, you kept it at one setting.
Sleep Expert	Yes. So I could, or would be able to... well in principle I am quite an agreeable person
R	Exactly
SE	But if I tuned it more to minus?
R	Shall we take a look?
Tool	I want you to sleep. It is 6 AM
SE	A bit more forcing
R	And if you set it to the other side
Tool	Wake up, you lazy asshole
SE	That is also waking up nicely hahaha

R	Yes exactly, so in that way it will think of you less and ore of itself. It will also say things like "I am hanging here the whole day and you just won't wake up goddammit".
R	Anyways, the first question I have is: what did you think of the interaction or the use of it?
SE	Well uhm. The use very easily, right. You can easily tune the way you want it. Or do you need to put your own mood in it? You need to put their mood in it, right?
R	Yes
SE	SO yeah. It is easy, it is idiot-proof. In that sense it is easy. And uhm, do you tune the times yourself. Or is will it learn your sleeping times?
R	Indeed, so it will first analyze how you sleep generally. I read online that it is most important to keep a sleeping rhythm consistent.
SE	Yes, definitely.
R	Okay, that is good to know. SO it will keep doing that schedule. And if you would like to change it. So if you did not like that you needed to wake up at 6, you can also push the minus button and it will tune itself. It might think "a, I notice he wants me to wake him up later rather than later"
SE	Alright, precisely. SO yeah it is easy to use. It is good that it thinks with you about the sleeping times. Have you also - what is important in the sleep of people, is the sleeping hygiene. So a lot of people these days watch television a lot for long with the lights full on. And they then think o no it's getting late I need to go to bed. SO it would be good to tune down the last half hour or hour before sleep. So for example, turning down the light, or reading a book for the half hour before going to sleep. At least not looking at a screen. Something like that can slo help. For example, it could say half an hour in advance: "go to sleep in half an hour. Think about it"
R	Yeah, that actually goes well into one of the next questions: What are good things to consider in relation to sleep except for the times? I also got the feedback that, also because it is not that long of a project, it is difficult to make something that really turns in to your sleeping schedule and takes long to tune. So for example the sleeping hygienesne. What are other factors than those times?
SE	Yea so the times are important. It is not the case that a longer sleep automatically is better. Some people only need six hours of sleep and I they lay in bed longer, they firstly have difficulties going to sleep and wake up during the night. So sometimes you need to shorten your sleeping time to keep your sleep good.
SE	And in terms of sleeping hygiene: the tuning down at the end of the day is important. So don't look at a screen with blue light. That will keep you up. Don't go running 5 kilometers half an hour before sleep. Then your body is not in resting mode and won't go to sleep. Don't take any caffeine-holding beverages after dinner. That could influence the sleep badly.
R	Also alcohol
SE	Also no alcohol. It is one big mismatch that people think it helps with sleep. People do fall asleep more easily, but it creates a lot more chaotic sleep. People wake up a lot more during the night. They all are <i>inkoppertjes</i> , but people don't think about it that it can influence their sleep so badly. And definitely those screens. These days people lay in bed with an iPad, just doing some things or watching a movie. Well you don't get sleep from that. If you were to read a book, that is a lot more easy on the eyes and calm and better for the sleeping hygiene. I think those are the most important things.
R	Yeah so no blue light, no hard physical activity, no caffeine and no alcohol. And reading a book is better than youtube in terms of the blue light

SE	Yes, and these days you have those <i>fluisterboeken</i>
R	OO listening books?
SE	Well really something to go to sleep that people go to sleep.
R	A kind of ASMR but then ... well ASMR is something different. Do you know ASMR?
SE	No
R	ASMR are videos of people that whisper and do weird and nice sounds. Some people like it when you hear something rubbing over your ear.
SE	I think I mean that, or that people like the sound of flipping pages. People like having something in the background to fall asleep.
R	Well that is something I can implement in my product. Introducing calm sounds.
SE	Yeah it is very personal indeed. And that is the good thing with an AI that it can look at what people want
R	You also have quite an idea of what AI is
SE	I try to imagine things about it
R	Yesterday I talked with someone who knew a lot abo tit and he also said "I don't know anything about it" haha
SE	Yeah it's quite abstract but you need to start somewhere
R	Alright then my next question: What kinds of people most often go to you with sleeping issues?
SE	I see mostly patients with sleep apnea obstructive sleep apnea. Those people are often overweight. They snore and when the tongue blocks the airways, they have a receding oxygen level throughout the night. And if that happens often enough, you get trouble with that throughout the day. So these people often sleep well. They fall asleep well, and sleep through well. However they wake up more tired then how they went to sleep
R	Because they do not get enough oxygen?
SE	Yes, and because the sleep is qualitatively too bad. These people fall asleep throughout the day easily. They are people that for example fall asleep in the waiting room, or people that drive in trucks and fall asleep there, which could be really dangerous. Those people I see most often. So those people have trouble with it throughout the day. But I also see people, indeed – and it's often coupled – with insomnia issues. These people have trouble sleeping in, so laying in bed for a long time before they fall asleep. Or sleeping through problems. They wake up often throughout the day. And people with restless legs. People who have the feeling that they can't keep their legs still through the night. Those people I see most often.
R	My target group is a bit towards the second group.
SE	Yeah, so people with other sleeping issues
R	Yes. What are things you could prescribe?
SE	For apnea, you have helping tools. But also for people with insomnia issues. It is good to ask through where those problems come from. Some people are already bad sleepers. They don't know what is good sleep. But you also have people who develop insomnia over time. SO they sleep well until their thirties or their fourties, and from a certain moment their sleep went bad. Many factors could be the reason for that.

R	What kinds of factors could be the reason?
SE	Like "Life Events". Those are happenings that have a big impact on people's lives. It could be that a partner, father, mother, grandma, grandpa dies, so they are psychically burdened. Or they lose their job, or they have a burn out. Those are external factors that often cause doubt in the night. Because of that they sleep less well and get tired. It is good to have a listening ear to that and also to ask through. Sometimes people go to you and say "I sleep badly, can I have a pill?" But a pill is often not the solution
R	Yeah, that is often a kind of bandage you put on it.
SE	Indeed, then you do cause one good night's rest, but you did not tackle the problem. So these are common causes. If it is not such a life event, and they have sleeping issues. Then you need to look at underlying medical reason. So for example restless legs, or apnea. Those are things that are also easy to treat. And if you can't find a reason then, then you need to look at the sleeping hygiene. Therewith, a lot of people have already been helped. A lot of people don't look it up or have never heard of it. Those people are often helped well with just a simple tip.
R	Okay. So it is often more psychically than physically?
SE	Yeah often it is. However, it is good to always make sure it is not a medical issue. Like sleep apnea and restless legs. But also with other forms of disease, for example parkinsons people often don't sleep well.
R	And that also often leads to restless legs, for example.
SE	Yes, but also certain medicine which makes you sleep badly, for example against psychosis or depressions. Those can also influence your sleep. Not that you stop those medicines, but that you have a reason why people sleep so badly. And if you have such a reason, people know it and have a lot more knowledge: "alright, it's because of this"
R	A yeah, and then they can watch that as well
SE	Those are I think the most important factors
R	So, it is also a part conscience of knowing how you can care for yourself to go to sleep well. And make sure you have rest before you go to sleep
SE	Yes exactly. All the factors around you need to be well. No TV in your room. No too warm in your bedroom.
R	Okay
SE	A lot of thing people can do themselves, yes. Sometimes what people do is – when they fall asleep hardly at night and have woken up throughout the day. They then sleep in and stay in bed until 10 a clock. What you do then is that you change your sleeping rhythm. If you only get up after 10, you won't be sleepy at 10pm. IN that way you push it through, and the frustration only becomes bigger.
R	So it is also very important to look at your sleeping rhythm still. And don't overfocus on the eight hours of sleep.
R	So is the eight hours of sleep more important or the getting up and sleeping around the same time?
SE	I think the sleeping rhythm is most important. And also in tems of time, there is a difference. Some people only need to sleep 6 hours while others need 9 or 10. So that is personal anyway. But I think the sleeping rhythm, that you keep the same times, is the most important actually.
R	And how big can a deviation be? Say you have a 10pm – 6am schematic, can that also be a 8pm-4am schema, or 8- 8.
SE	Everything is possible of course, but as people we are dependent on the light around us. We have a sleeping rhythm that repeats itself every 10 hours.

R	Circadian rhythm right?
SE	Indeed. And it is also tied to chemicals in your body. So what you can do. There are LEDs you can get. So on day 1 you have a certain level of melatonin in your body, and around 8 a clock you notice that you slowly are getting sleepy. SO you can change your circadian rhythm and the chemicals in your body.
R	Precisely. And those chemicals don't work exactly on time, like exactly at 10 a clock you have this level.
SE	Exactly, and for some people – you have morning people and evening people, and there is a difference. It could be that that is because of those chemicals in your body.
R	Yes, so that is really a thing? Morning and evening people?
SE	Yes, it really is a thing yes. And it is hard to fully thrown your sleeping schedule around. People with night shifts do that of course, but it is not healthy per se for your body to go against it. It is unnatural. So I think the difference between whether it is 9:30 or 11:30, I don't think that's where the big difference lies. It is more personal. But it is best to go to sleep in the evening and to wake up in the morning with the rising sun.
R	Yeah, exactly. It is around one hour...
SE	Yes. And age also plays a difference. Between old people and young people there is difference in sleeping patterns. Old people wake up more throughout the night, they sleep in harder and in general sleep more unsteadily. You should keep that into account. If you have a young person that wakes up often during the night, that probably worse than when you have someone of 80 y/o doing that.
R	Because older people have a less active life throughout the day, or?
SE	Maybe yes, but more because of the chemicals that influence your sleeping rhythm.
R	Okay. Then I have some more questions. One of them, that applies here, is: how big is the sleeping problem-problem?
SE	I think it is a big problem. I don't dare to say numbers but they probably are findable on the internet. I can imagine well that one out of 10 people in the Netherlands have sleeping problems, in lesser or more gravity. Maybe a bigger amount. Everyone of course has a bad night from time to time, when they are thinking and such. But I think that the sleeping problem is big within the Netherlands. And I also think that a lot of people create a lack of sleep for themselves by going to bed late and having to work early. I think that also is a big group. But also that a lot of people sleep badly. Fall asleep and stay asleep badly. I think it is a big problem, that many people can benefit.
R	Okay, I find that good to hear. I can quote that haha
SE	Definitely
R	And Do you know papers I can read to know more about sleeping problems, and those edge factors, sleeping rhythms circadian rhythms and such.
SE	Well, I don't know them from the top of my head but I think I can definitely find some.
R	Cool! Could you send those to me?
SE	Yes I have your email address and your number.
R	Even my number, I saw
R	Then, If you would have designed the product or if you would need to change something about it, what would you change?
SE	I think the concept is very good. I would mostly not make it more difficult than it is. In the sense that it is easy to use. You have three buttons now, as I see it now. I think it is very good that you keep it very simple and that the normal person can do

	something with it. Or the normal person, I mean the people with a less high IQ. You immediately see what you need to do when you see it. You see the negative and the positive knob so you know what to do with it. And the positive and negative feedback sounds very good. I find it beautiful to see. I think it is good to do more around the sleep. So it could give tips earlier on in the evening, for example in terms of sleeping hygiene and sleeping rhythm. Furthermore.....
SE	No, I don't know what to do. For now, can't think of something
R	So mostly those edge factors actually...
SE	Yes, so it is indeed mostly for people with in-and-through-sleeping problems. There the sleeping hygiene is good to take with you. There it is fast and easy to make improvements.
R	Indeed, and then also the awareness of if you sleep bad, it could be because of this and you could look at this...
SE	Yeah, so I assume you have to give feedback on how you slept in the morning.. That it learns from that.
R	Yeah, that can be.
SE	That would be beautiful, if it learns from that. If you say, hmm I slept badly, that it asks "how come?" And then you can say that you have gone to bad late, or you took some beers. Or I have worked out late. I think that would be insightful.
R	And that it also through that conversation already guide people.
SE	Yes
R	That is a good idea, actually.
R	Cool! That were all my questions. Do you have questions for me?
SE	No, I find it funny. Cool project. I really think this plays in the Netherlands, ad sleep is... If people really have an insomnia, so they sleep through badly, they often go to a psychologist for cognitive behavioral therapy. Those are expensive and intensive treatments. Those can be tackled through things such as this. I know that there also is – not specifically cognitive behavioral therapy – that there are also things for cognitive behavioral therapy. There are questionnaires and online psychiatrists. Those kinds of things you can also integrate with this.
R	Yeah, so also those questionnaires and making people reflect.
SE	Yeah
R	Also, I have another question a bit outside the scope of this interview. I saw a video that people, before the invention of light and the switch to living on artificial light, we had a double cycle sleeping schedule. Is that natural, do you think?
SE	Well, in the sense that you have two sleeping periods, you mean.
R	Yeah, so if the sun went down early, you would for example go to sleep until 2AM. And then you would be awake for an hour and go to sleep after that again.
SE	Yeah, I've heard that before yes. I can't say exactly where that comes from. It probably has to do with light and where people lives. If they lived close to the equator or more north or south. Or with sustenance
R	Yeah, so I had a pretty radical idea at the beginning to make people live on that schedule, but it doesn't really fit with how people nowadays live.
SE	No, I don't think so. But the sleeping schedule like we have it now, so people start with deep sleep and after 90 minutes they get a period of dream sleep. And that repeats itself 3 or 4 times. So you have 4 sleeping schedules, where the deep sleep is more in the beginning of the night and the second half has more dream sleep. There is not really a division in that. So if you were to do that – maybe people can learn to live with it as well – but it would mostly would be a lost hour for the people.
R	Okay exactly. Well funny.

SE	That is true
R	Thank you so much..
SE	No problem
R	If those papers.....

Thematic analysis

what aspects does a sleep bot need to focus on to be effective?			
Themes	code	Participant	Subtheme
Help with sleeping in			
	I'd rather it would help with going to sleep rather than suggesting a sleeping rhythm.	P3	-
	For example, it could say half an hour in advance: "go to sleep in half an hour. Think about it"	SE	-
Side factors			
	what is important in the sleep of people, is the sleeping hygiene	SE	Sleep hygiene
	It is good to ask through where those problems come from.	SE	Find problem
	And if you have such a reason, people know it and have a lot more knowledge: "alright, it's because of this"	SE	Find problem
	All the factors around you need to be well age also plays a difference	SE SE	Sleep hygiene Age
	Old people wake up more throughout the night, they sleep in harder and in general sleep more unsteadily. You should keep that into account	SE	Age
Importance of factors			
	It is not the case that a longer sleep automatically is better	SE	Rhythm
	I think the sleeping rhythm, that you keep the same times, is the most important [for healthy sleep] actually.	SE	Rhythm
	I think it is good to do more around the sleep. So it could give tips earlier on in the evening, for example in terms of sleeping hygiene and sleeping rhythm	SE	Sleep hygiene

E: Expert 2 interview setup + notes taken

Toestemmingsformulier proefpersoon

Gespreksmethodes verhoging veerkracht

- Ik heb informatie gekregen en ik begrijp waar dit onderzoek over gaat. Ook kon ik vragen stellen. Mijn vragen zijn voldoende beantwoord. Ik had genoeg tijd om te beslissen of ik meedoe.
- Ik weet dat meedoen vrijwillig is. Ook weet ik dat ik op ieder moment kan beslissen om toch niet mee te doen of te stoppen met het onderzoek. Daarvoor hoef ik geen reden te geven.
- De verzamelde gegevens zijn: notities bij antwoorden op vragen en een spraakopname.
- Ik weet dat sommige mensen mijn gegevens kunnen inzien. Die mensen zijn Simon de Vries en Yaliang Chuang.
- Ik geef toestemming voor het verzamelen en gebruiken van mijn gegevens voor wetenschappelijke publicaties en meer of ander onderzoek op mijn gegevens.
- Ik geef toestemming om mijn gegevens op de onderzoekslocatie nog [15] jaar na dit onderzoek te bewaren.

Ik wil meedoen aan dit onderzoek.

Naam proefpersoon:

Handtekening: _____ Datum : __ / __ / __

Ik verklaar dat ik deze proefpersoon volledig heb geïnformeerd over het genoemde onderzoek.

Als er tijdens het onderzoek informatie bekend wordt die de toestemming van de proefpersoon zou kunnen beïnvloeden, dan breng ik hem/haar daarvan tijdig op de hoogte.

Naam onderzoeker (of diens vertegenwoordiger):

Handtekening: _____ Datum: __ / __ / __

De proefpersoon krijgt een kopie van het getekende toestemmingsformulier.

Interview [experts' names]

Gesprekstechnieken veerkracht

18/11/2021 ~ semi-structured ~ 30-60 minutes ~ notes and voice recordings

Vandaag interview ik [experts' names] Zij zijn in dit geval mijn experts op het gebied van mentale gezondheidszorg. Het doel van dit interview is het vinden van een methode waarop Deary een gesprek kan voeren om veerkracht te verhogen. De doelgroep is jongeren van 20-25 jaar, die vaak hoge verwachtingen en bijkomende stress ervaren.

Vragen

1. Wat zijn manieren om veerkracht te verhogen?

2. Wordt het verhogen van veerkracht eigenlijk wel therapeutisch gedaan?

3. Wanneer wordt zo'n methode toegepast?

4. Wat is het einddoel bij een gesprek of therapieessie voor veerkracht?

xxxvi

5. Hoe weet je dat dat doel is bereikt?

6. Welke aspecten moet je te weten komen om dat doel te bereiken?

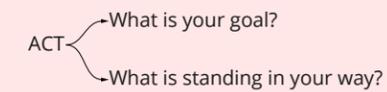
7. Wat zijn belangrijke gespreksonderwerpen bij veerkracht?

8. Het ding wat ik maak is er vooral om mee te praten, eigenlijk zonder dat er vooraf een klacht is vastgesteld. Hoe zou jij op zo'n moment/manier een gesprek beginnen?

9. Waar zou ik meer kunnen vinden over gesprekstechnieken voor het verhogen van veerkracht?

Notes made right before, during and right after the psychiatrists interview

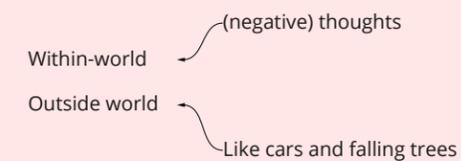
Before



ACT works with metaphors a lot

When you are stuck in your head a lot, you become one with your thoughts. This is called *Fused with your thoughts*. You are what you think

Mindfulness --> here and now, get away from your thoughts



Evade fight-or-flight. Just accept the feelings

During

What is resilience?

A: The extent to which you can move with forces and developments that you encounter.

Life events, but also small things like a broken tap.

It is a wide concept

What do you do with the things you encounter?

It is also rooted in survival: the people with the best manner of adapting survive best.

R: mental stretch. How well you can go with the things that happen to you.

How do you increase your resilience?

R: like a rubber band. You will break if you stay under pressure.

- Learn how to relax
- learn how to detect and handle stress.

Discovering and trusting when you are not relaxed.
Like mud rising to your chin, detecting that it is there before it's too late so you can get out of it.

Is increasing resilience done therapeutically?

Definitely. There are whole treatment currents such as **ACT** to increase your **Psychic Flex**. These therapies are applied when you are under stress and need to learn how to destress.

Decrease your stress and increase your resilience.
One tool is a '**signaleringsplan**', to detect stress in different levels.

Another one is '**seeking safety**': making a relaxed space for yourself, like with blankets. This is done for people who get agitated quickly. Not only PTSD. How can you get a personal place? Take care for things around you.

and **meditation** helps, related to **mindfulness**

also, you have '**oplossingsgerichte therapie**'

and you can focus on pleasurable activities with the '**plezierige activiteiten lijst**' (**PAL**).
When people are under stress, they can also forget what they actually get happiness from. It is good to then touch back to what you like.

You also have classic cognitive behaviour therapy, where you thresh out ('*uitpluizen*') your thoughts, with a '**G-schema**'

And you have **Narrative** therapy, with which people explore their thoughts by telling about it.

When is such a method applied therapeutically?

When you get complaints because of oversteering. It happens when you get bodily complaints because of mental processes (psychosomatic).

When the workload is bigger than the carrying capacity. When that is out of balance. You then need to **break patterns** to ensure a **sustainable recovery**

What is the end goal with such a therapeutic session for resilience?

It is different for everyone.

- Get a grip on problems
- Understand how things work
- Being able to steer yourself
- Getting better at handling mental complaints

That self-management becomes unnecessary

Interlude

I wonder whether the tool will work.

There is such a thing as *transactional distance*. You learn more from a thing that is close to you. But sometimes there is a high threshold to go to someone.

The tool could be an introduction to improve your resilience. If you don't dare talk to anyone about it, you might feel bad about that and a downward spiral gets made.

The tool could be a helping hand for maintenance

What are important subjects to talk about with resilience?

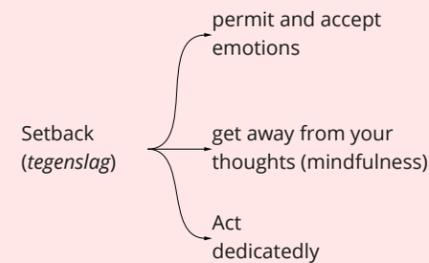
Depends.
With ACT, it is about accepting feelings. Don't put them away. Living to your **values**.

What do you feel? What do you think?

Don't take all your thoughts seriously.

Make yourself aware of what you find important.

It is okay if you aren't doing well.



People put a lot of rules upon themselves

you don't NEED to do as much

Be less demanding of yourself

shut of non-helping thoughts such as social pressure (I think they will do this... if I don't do this...)

The tool I am making mostly is there to talk to, without a complaint from the start. How would you start a conversation on such an occasion or moment?

It is hard. There should be some kind of start.
The person should give a signal
Or there should be a structure, like a fixed moment to talk about it.

Asking for help at a certain moment.

Stand still with how you feel and what it means

Stand still with how you feel and what it means

- helpen in de eerste persoon --> je verplaatsen in de schoenen
- Reflecting on how things have gone. What went well? What went less well?
- You could use a **positive diary** for this

Where can I find out more about conversational techniques to increase resilience?

You can look into '**oplossingsgerichte therapie**'. This makes the person better steer themselves. It is dependent on the right questioning.

Self regulation

'Nederlandse Empowerment Lijst'

Op het Internet

After

What are the three waves of cognitive behaviour therapy?

1: conditioning --> stimulus-reaction actions. It is about punishing and rewarding yourself

2: Threshing out thoughts (*gedachtes uitpluizen*)

3: ACT, actually letting go, observing and not judging --> there will always be thoughts.

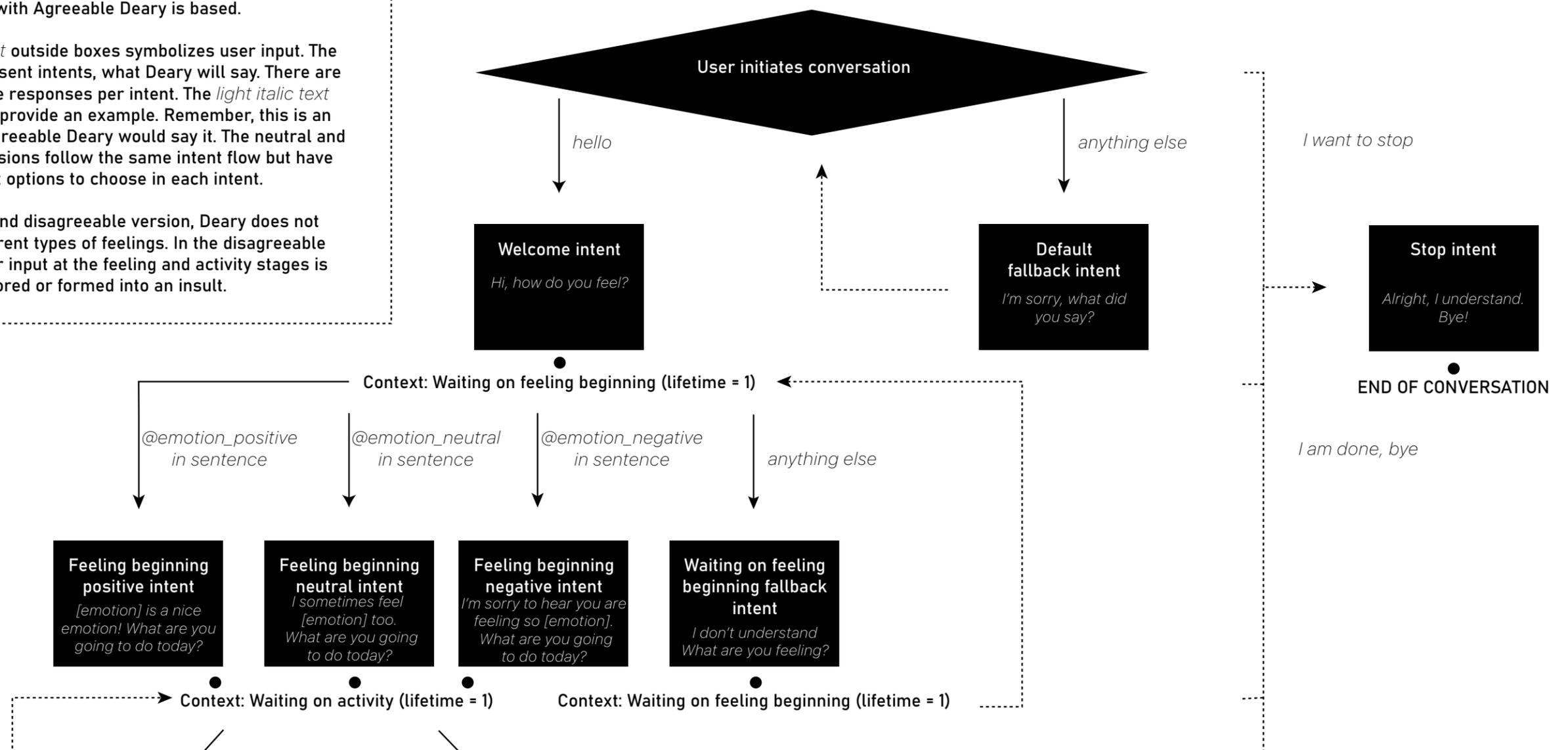
xxxix

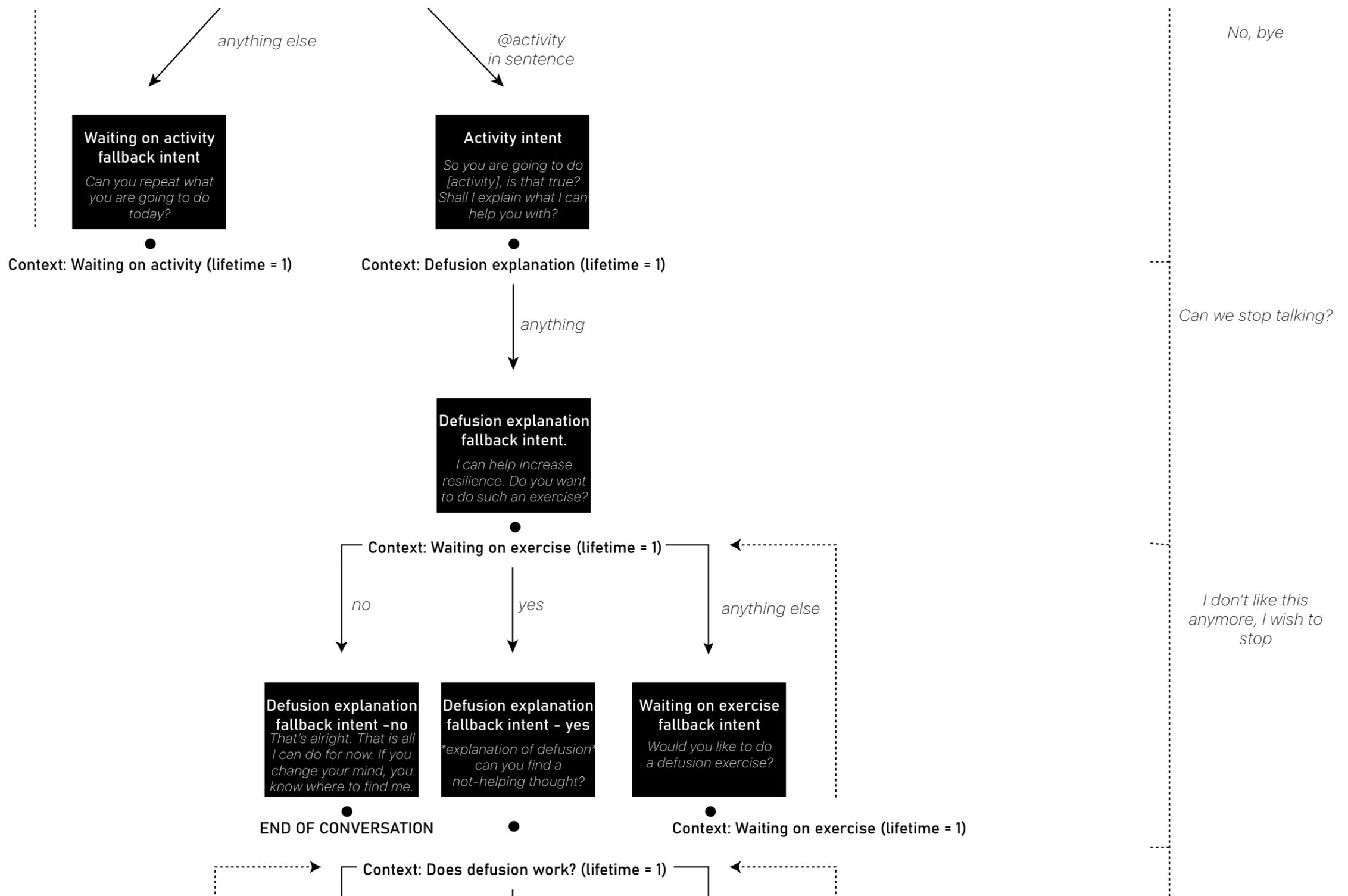
Dialog flow tree Deary Agreeable

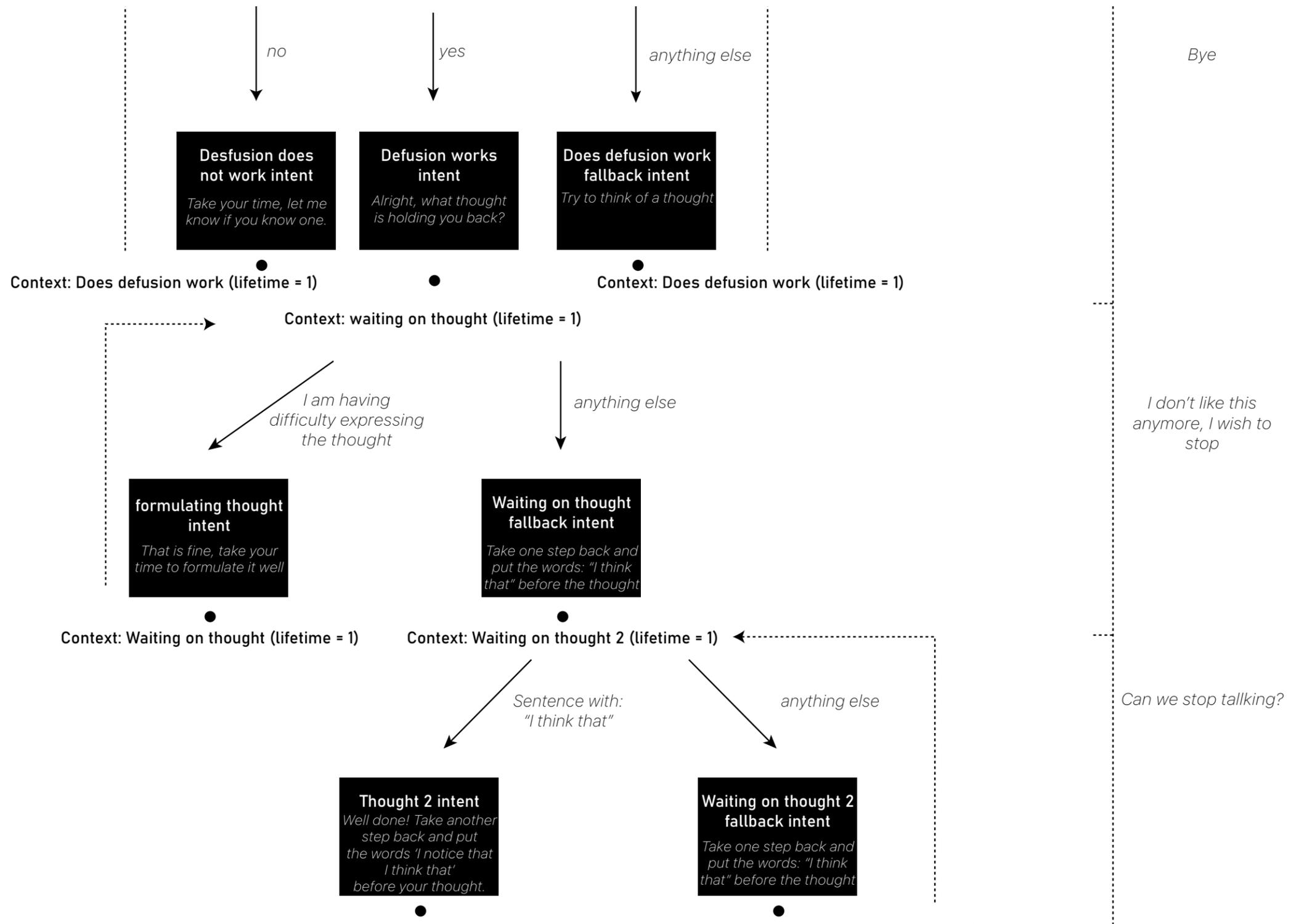
Below and to the right, you see the tree on which the dialog flow with Agreeable Deary is based.

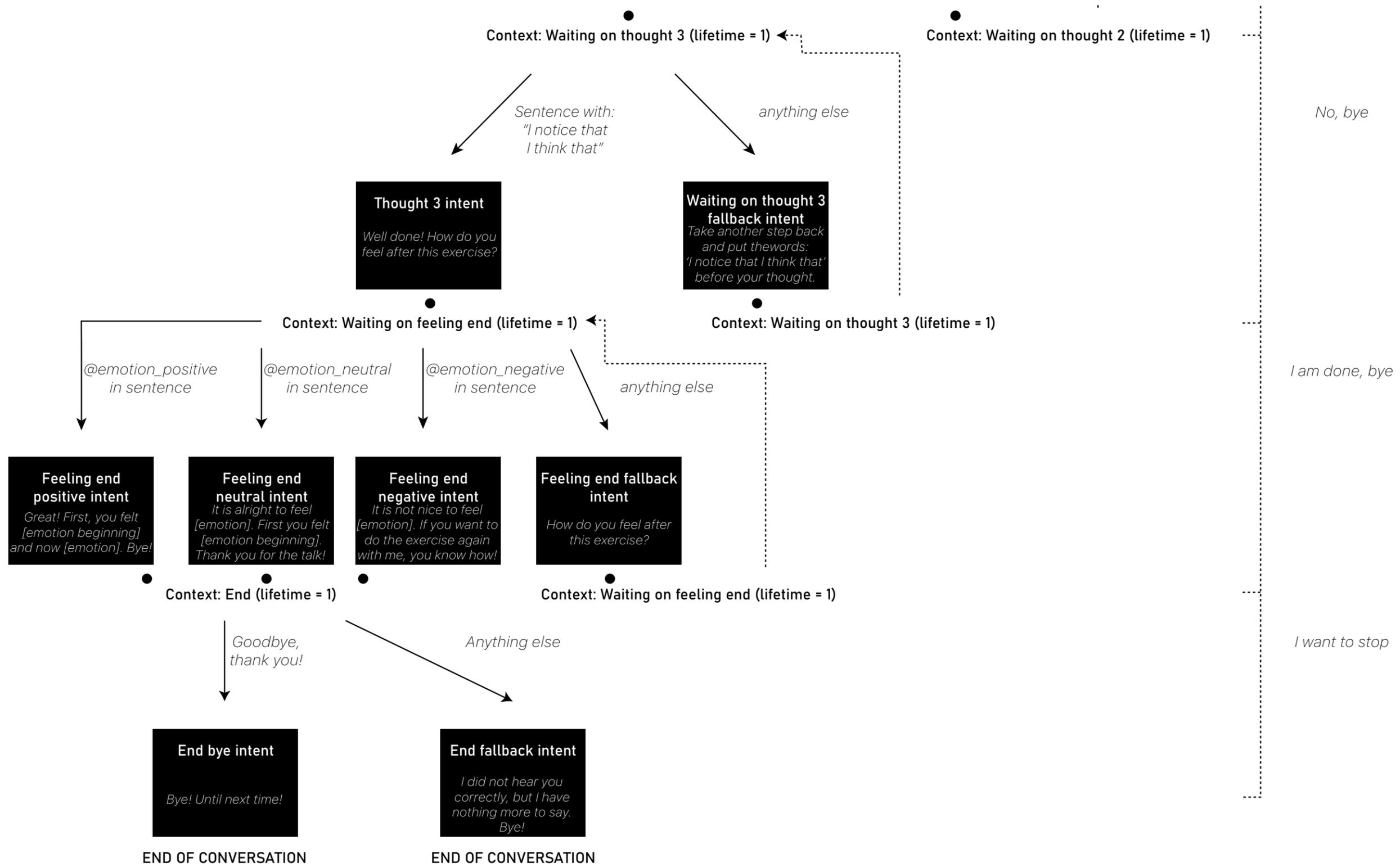
The *light italic text* outside boxes symbolizes user input. The black boxes represent intents, what Deary will say. There are multiple possible responses per intent. The *light italic text* inside the boxes provide an example. Remember, this is an example of how agreeable Deary would say it. The neutral and disagreeable versions follow the same intent flow but have different options to choose in each intent.

In the neutral and disagreeable version, Deary does not respond to different types of feelings. In the disagreeable version, the user input at the feeling and activity stages is ignored or formed into an insult.









Deary Dialogflow Speech settings - 1

Agreeable

TEXT TO SPEECH

Enable Automatic Text to Speech

Automatically convert default text responses to speech in all conversations. The output audio will be included in `DetectIntentResponse` and `StreamingDetectIntentResponse`.

Output Audio Encoding

16 bit linear PCM (signed, little-en...

VOICE CONFIGURATION

Configure your agent's synthesized voice in the V2 API and Telephony integration.

Agent Language

nl (Dutch)

Voice

nl-NL-Wavenet-B

SPEAKING RATE: 1

PITCH: -6 (SEMITONES)

VOLUME GAIN: 0 (DB)



Select 'Audio Effects' profiles. (For standard API calls, won't affect Telephony integration)

'Audio Effects' profile

Neutral

TEXT TO SPEECH

Enable Automatic Text to Speech

Automatically convert default text responses to speech in all conversations. The output audio will be included in `DetectIntentResponse` and `StreamingDetectIntentResponse`.

Output Audio Encoding

16 bit linear PCM (signed, little-en...

VOICE CONFIGURATION

Configure your agent's synthesized voice in the V2 API and Telephony integration.

Agent Language

nl (Dutch)

Voice

nl-NL-Wavenet-B

SPEAKING RATE: 0.9

PITCH: -4 (SEMITONES)

VOLUME GAIN: 0 (DB)



Select 'Audio Effects' profiles. (For standard API calls, won't affect Telephony integration)

'Audio Effects' profile

Deary Dialogflow Speech settings - 2

Disagreeable

Deary_Disagree SAVE

General Languages ML Settings Export and Import Environments **Speech** Share Advanced

TEXT TO SPEECH

Enable Automatic Text to Speech
Automatically convert default text responses to speech in all conversations. The output audio will be included in DetectIntentResponse and StreamingDetectIntentResponse.

Output Audio Encoding
16 bit linear PCM (signed, little-en..

VOICE CONFIGURATION
Configure your agent's synthesized voice in the V2 API and Telephony integration.

Agent Language
nl (Dutch)

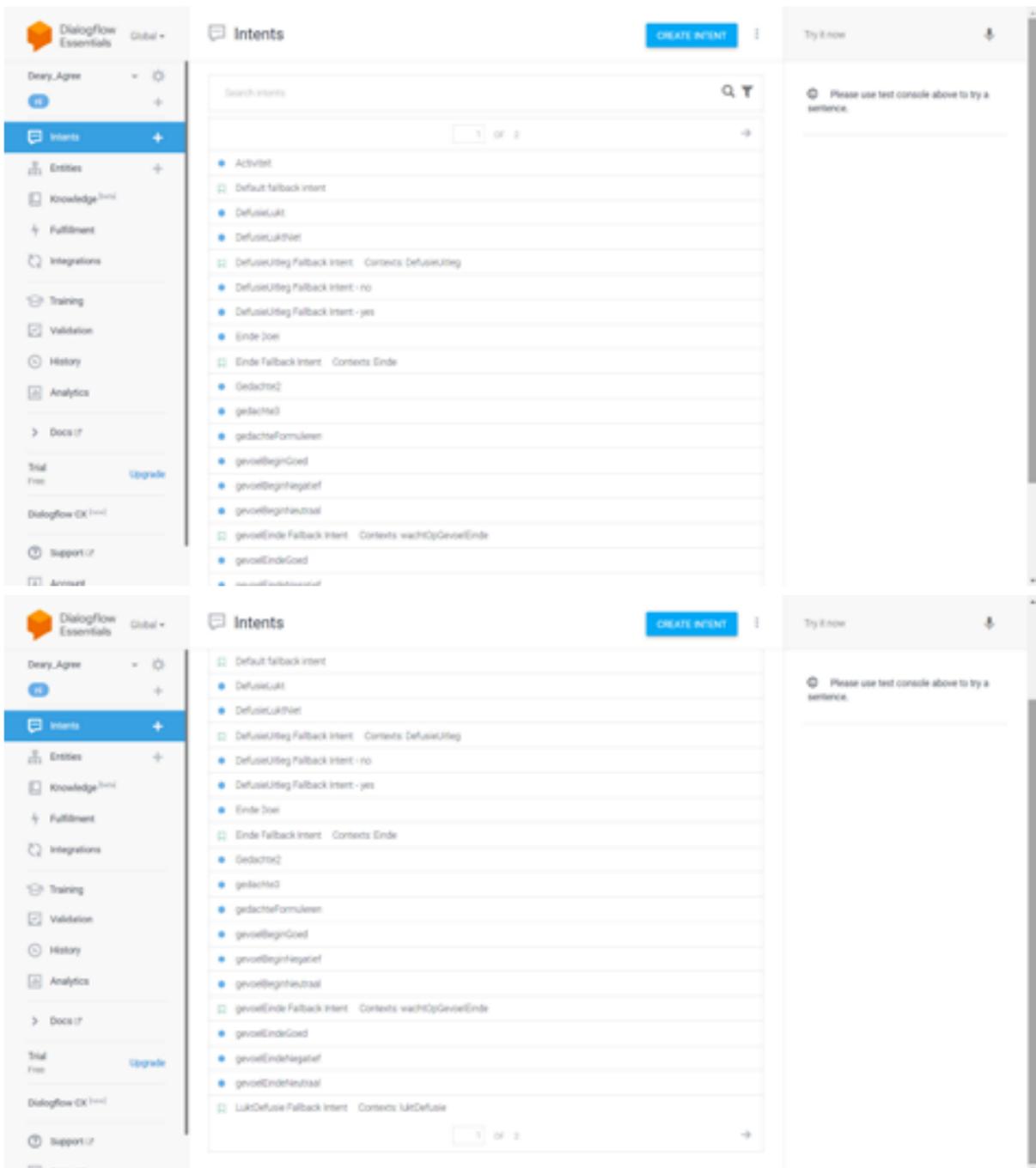
Voice
nl-NL-Wavenet-B

SPEAKING RATE: 0.8 PITCH: -2 (SEMITONES) VOLUME GAIN: 0 (DB)

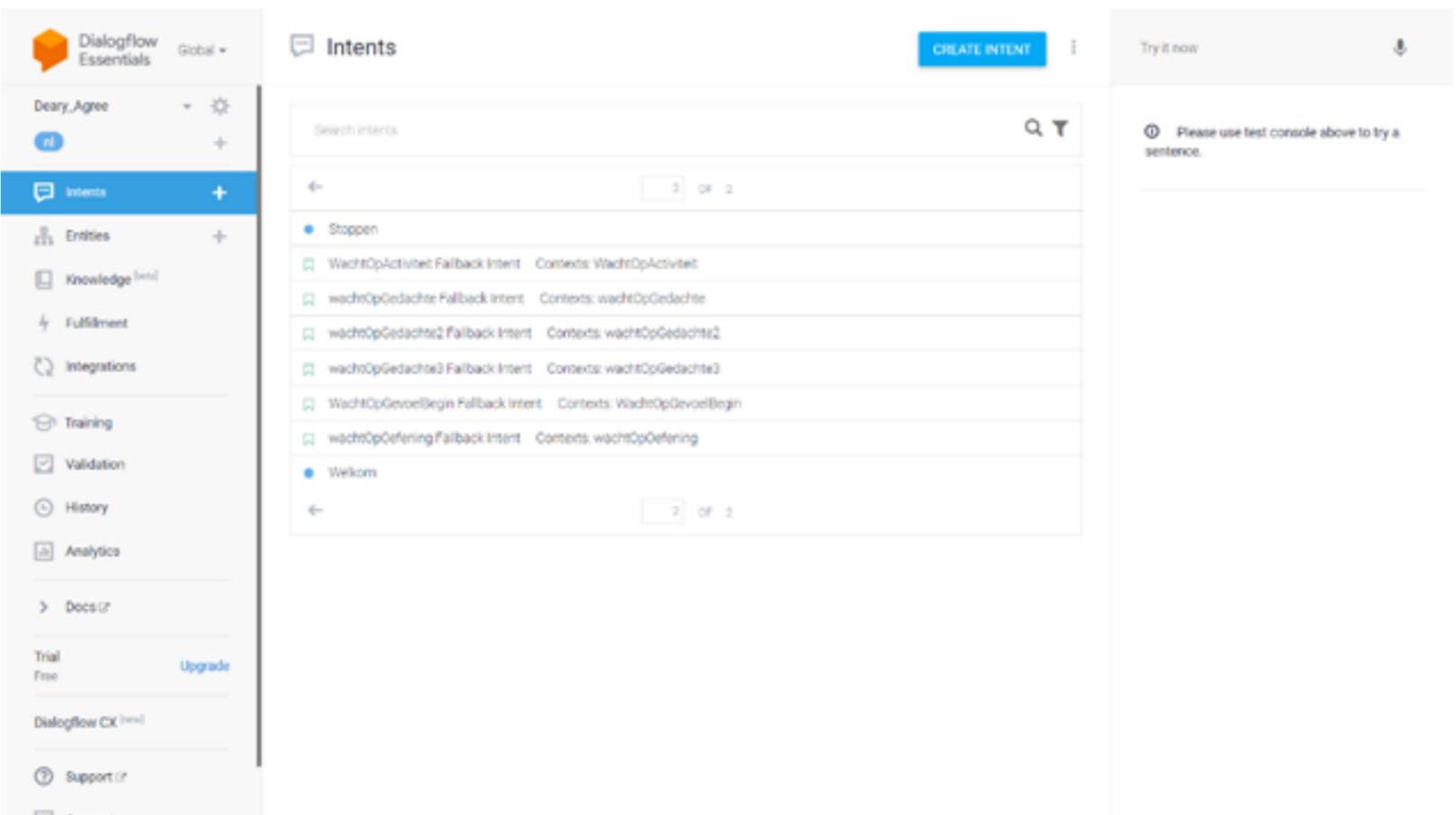
Select 'Audio Effects' profiles. (For standard API calls, won't affect Telephony integration)

Audio Effects' profile

Deary agree Dialogflow Intents page - 1



Deary agree Dialogflow intents page - 2



xlviiii

Deary agree Dialogflow Stop intent

The image displays two screenshots of the Dialogflow console interface, illustrating the configuration of a 'Stoppen' (Stop) intent.

Top Screenshot: Training Phrases

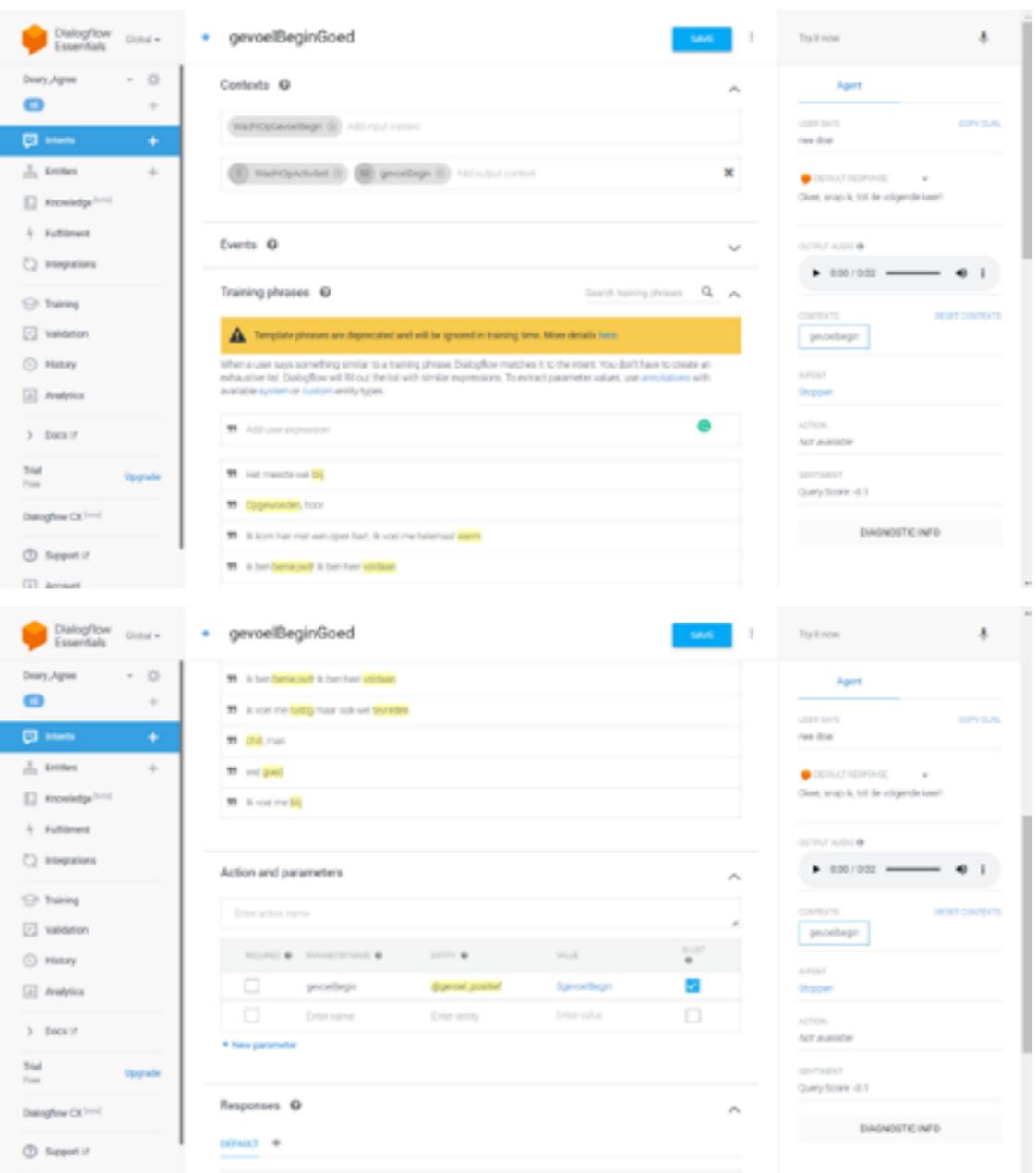
- Contexts:** None.
- Events:** None.
- Training phrases:** A list of phrases is shown, including "ik wil niet meer", "ik ben er klaar mee. Doe", "Kunnen we stoppen met praten?", and "ik vind dit niet mee fijn, ik wil stoppen met het gesprek". A warning message states: "Template phrases are deprecated and will be ignored in training time. More details here." Below the list, there is an "Add user expression" button.
- Action and parameters:** This section is collapsed.

Bottom Screenshot: Action and Parameters

- Action and parameters:** This section is expanded, showing a table for defining parameters. The table has columns for 'REQUIRED', 'PARAMETER NAME', 'ENTITY', 'VALUE', and 'IS LIST'. A 'New parameter' button is located below the table.
- Responses:** A list of responses is provided for the intent:
 1. Okee, snap ik, tot de volgende keer!
 2. Dat is goed. Ik vond het een fijn gesprek. Tot later!
 3. Okee, tot de volgende keer.
 4. Enter a text or SSML response variant.An "ADD RESPONSES" button is present below the list. A checkbox at the bottom is checked and labeled "Set this intent as end of conversation".

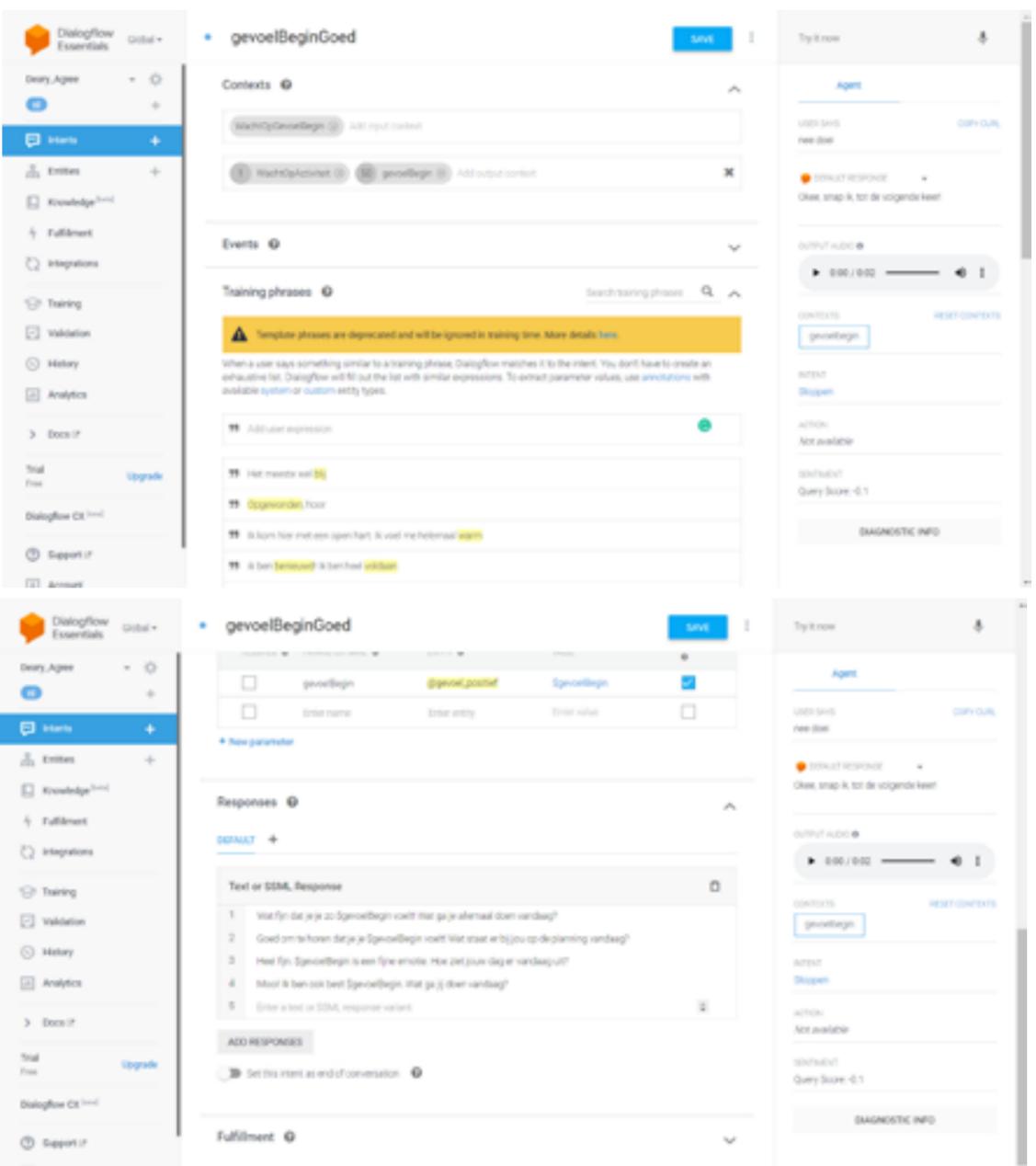
Right Panel (Agent Configuration):

- Agent:** Deary_Agree
- USER SAID:** mee doe
- DEFAULT RESPONSE:** Okee, snap ik, tot de volgende keer!
- OUTPUT AUDIO:** 0:00 / 0:02
- CONTEXTS:** geveelbegin
- INTENT:** Stoppen
- ACTION:** Not available
- SENTIMENT:** Query Score: -0.1
- DIAGNOSTIC INFO:** Button



Deary agree Dialogflow Feeling beginning positive intent - 1





Deary agree Dialogflow Feeling beginning positive intent - 2



Deary agree Dialogflow Entities - 1

The image displays two screenshots of the Dialogflow Entities management interface. The top screenshot shows the 'Entities' overview page, and the bottom screenshot shows the configuration page for the 'gevoel_positief' entity.

Entities Overview:

- Custom System
- Search entities
- @activiteit
- @gevoel
- @gevoel_negatief
- @gevoel_positief

Entity Configuration (gevoel_positief):

- Define synonyms:
- Regex entity:
- Allow automated expansion:
- Fuzzy matching:

leefdevel	leefdevel, leevijk, veriefde volfsen, genegen, warmhartig, warm innig, sympathievol, liefdevol, leevolijk, lieflijk, liefbaar, volbare, genegen, warmhartiger, warmer, inniger, sympathievoller
verrast	verrast, beduurd, van mijn kumpen, verbuft, verstonid, overvallen, overrompeld, overvondend, verbaasd, verwondend, verrast, beduurd, verbuft, verstonid, overvallen, overrompeld, overvondend, verbaasd, verwondend
kutig	ruutig, fijn, even, kalm, kutig, vreedzaam, vreedig, onverschuld, beheerst, nuchter, vreedzaam, bevestigd, bevestigd, ruutig, fijn, serene, kalm, kutig, vreedzaam, vreedig, onverschuld, beheerst, nuchter, vreedzaam, bevestigd, bevestigd, luttel, luttel, chit, chit, helder, helder
enthousiast	enthousiast, opgetogen, nieuwsgierig, geïnspireerd, geïnmeerd, opgewonden, bevrogen, begeesterd, juug, fanatiek, fervent, ze in, enthousiast, opgetogen, nieuwsgierig, geïnmeerd, opgewonden, bevrogen, begeesterd, juug, fanatiek, fervent, excited, benieuwd, benieuwd
bij	bij, goed, vrolijk, tevreden, verheugd, leuk, jolig, opgewekt, plezierig, plezierig, gelukkig, blijmoedig, gelukkig, extatisch, wonderlijk, bije, beter, vrolijk, tevreden, verheugd, leuk, jolig, opgewekt, plezierig, plezierig, gelukkig, blijmoedig, gelukkig, extatisch, wonderlijk, lekker, mooi

Click here to add entry

+ Add a new

Agent Configuration:

- USER DATA: [COPY DATA](#)
- See data
- DEFAULT RESPONSE: [EDIT](#)
Oke, snap ik, tot de volgende keer!
- OUTPUT AUDIO: [EDIT](#)
0:00 / 0:02
- CONTEXTS: [RESET CONTEXTS](#)
gnoefbegin
- INTENT: [EDIT](#)
Stoppen
- ACTION: Not available
- PARAMETERS: Query Score -0.1
- [DIAGNOSTIC INFO](#)



Deary agree Dialogflow Entities - 2

The image displays two screenshots of the Dialogflow Entities editor interface, showing the configuration of two entities: 'gevoel_negatief' and 'gevoel'.

Entity: gevoel_negatief

Entity	Synonyms
boos	boos, wroedend, zedend, geïgterd, kwaad, haatlijk, haetvol, geïgterd, ghitig, geteren, kribbig, driftig, wroeten, boze, wroedende, zedende, geïgterde, kwaad, haatlijk, geïgterde, ghitig, geterene, kribbig, driftige, wroetene
somber	somber, verdrietig, sp, blauw, bedrieff, droevig, triest, weemoedig, elendig, treurig, misnoedig, tweerzelig, vieslijk, slecht, down, naargeestig, verdrietig, opper, blauw, bedroefde, droevige, somberde, trieste, weemoedige, elendig, treurige, misnoedige, tweerzelig, vieslijke, slechte, downe, naargeestige, kut, kuter, ruk, rukter
ongerust	ongerust, bang, angstig, benauwd, huiverig, bedend, banglijk, angstvallig, nerveus, schus, bangen, angstige, benauwde, huiverig, bedende, banglijke, bangig, bangige, angstvallige, nerveuze, ongeruste, schuwet, getreust, getreuste, gespannen, gespanner
verschuld	verschuld, wispelt, afchuwelijk, afgrijslijk, huiverig, guwelijk, verschuuder, wispeltje, afgrijslike, huiverig, guwelijke, afchuwelijke
verward	verward, dwaas, raar, gek, in de war, warig, niet onder controle, verward, dwaas, raar, gek, in de war, warig, niet onder controle, verward

Entity: gevoel

Entity	Synonyms
bedachtzaam	bedachtzaam, bezonnen, bedenkelijk, nadenkend in gedachten, attent, doordacht, in mijn gedachten, opgenomen, bedachtzamer, bezonnener, bedenkelijke, nadenkende, attent, doordachtig, opgenomener
prima	prima, redelijk, misal, gaat wel, okes, redelijke



Deary agree Dialogflow Entities - 3

The image displays two screenshots of the Dialogflow Entities editor interface, showing the configuration for the 'activiteit' entity. The interface includes a left sidebar with navigation options like 'Deary_Agree', 'Intents', 'Entities', 'Knowledge', 'Fulfillment', 'Integrations', 'Training', 'Validation', 'History', 'Analytics', 'Docs', 'Trial Free', 'Dialogflow CX', 'Support', and 'Account'. The main area shows a table of entities with their descriptions and a 'Try it now' panel on the right.

Entity: activiteit

Options: Define synonyms, Regexp entity, Allow automated expansion, Fuzzy matching

Reizen	Fietsen, Spring op de fiets, Mountainbiken, Mountainbike, Racefiets, Racefietsen, Reizen, Trein, Auto, Vliegtuig, Auto rijden, Rijden, Vliegen, Winkelen, Op weg, Weggaan, Ga weg, Wandelen
Afgeven	Afgeven, Een vriend, Samen iets doen, Chillen, meeten
Werkten	Werkten, Naar werk, Aan de bak, Aan de slag, Naar kantoor, veel doen
Boodschappen doen	Boodschappen doen, Naar de winkel, iets halen, inkopen, Albert Heijn, Jumbo, Lidl, Aldi, Kruidvat, Supermarkt, Boodschappen, Winkelen, winkelen
Muziek maken	Muziek maken, Gitaar spelen, Piano spelen, Pianoles, Gitaars, Drumles, Drummen, Fluiten, Panfluiten, Fluitjes, Okeas, Muziceren, Repeteren
Dansen	Dansen, Breakdance, Ballet, Hip-Hop
Koken	Koken, iets lekkers maken, in de oven, Bakken, Braden
Klussen	Klutselen, Klussen, Zagen, Knippen en Plakken, Doe het zelf, Smeetsen
Relaxen	Relaxen, Helemaal niets, uitrusten, Zien, weinig, niksien, bankhangen, gamen
Sporten	Sporten, Klimmen, Boulderen, tennisen, Hockey, Voetbal, Taekwondo, Vechtsport, Hiken, Volleybal, Curling, Schaatsen, Basketbal, Handbal, bewegen, Yoga, Naar de Gym, Gym, Sportschool, Top-roepen, zwemmen, polsstokhooppringen
Studeren	Studeren, in de boeken, huiswerk, leren, tentamen, universiteit, lecture, lesing, schoolwerk, school, les
naar buiten	naar buiten, naar het bos, wandelen, lopen, mijn huis uit
eten	eten, diners, restaurant, etensoek, uiten, lunchen, pizza, avondeten, boterhammen, ontbijten
knutselen	Knutselen, knutselen, knutselen, knutselen

Entity: activiteit

Options: Define synonyms, Regexp entity, Allow automated expansion, Fuzzy matching

Muziek maken	Muziek maken, Gitaar spelen, Piano spelen, Pianoles, Gitaars, Drumles, Drummen, Fluiten, Panfluiten, Fluitjes, Okeas, Muziceren, Repeteren
Dansen	Dansen, Breakdance, Ballet, Hip-Hop
Koken	Koken, iets lekkers maken, in de oven, Bakken, Braden
Klussen	Klutselen, Klussen, Zagen, Knippen en Plakken, Doe het zelf, Smeetsen
Relaxen	Relaxen, Helemaal niets, uitrusten, Zien, weinig, niksien, bankhangen, gamen
Sporten	Sporten, Klimmen, Boulderen, tennisen, Hockey, Voetbal, Taekwondo, Vechtsport, Hiken, Volleybal, Curling, Schaatsen, Basketbal, Handbal, bewegen, Yoga, Naar de Gym, Gym, Sportschool, Top-roepen, zwemmen, polsstokhooppringen
Studeren	Studeren, in de boeken, huiswerk, leren, tentamen, universiteit, lecture, lesing, schoolwerk, school, les
naar buiten	naar buiten, naar het bos, wandelen, lopen, mijn huis uit
eten	eten, diners, restaurant, etensoek, uiten, lunchen, pizza, avondeten, boterhammen, ontbijten
leesten	leesten, lezen, zuipen, alcohol, jeng, drinken
slapen	slapen, naar bed, dromen, insluiten, dutten
naar de badkamer	douchen, onder de douche, tanden poetsen, in bed opmaken, make-up, me wassen
opruimen	opruimen, stofzuigen, opruimen, samen lappen, tidy

[Click here to edit entry](#)

[+ Add a row](#)

Try it now

Agent

USER SAID: [COPY DATA](#)
nee doe!

DEFAULT RESPONSE: [+](#)
Oké, snap ik, tot de volgende keer!

OUTPUT AUDIO: [+](#)
▶ 0:00 / 0:00 ◀

CONTEXTS: [RESET CONTEXTS](#)
gnoofbegin

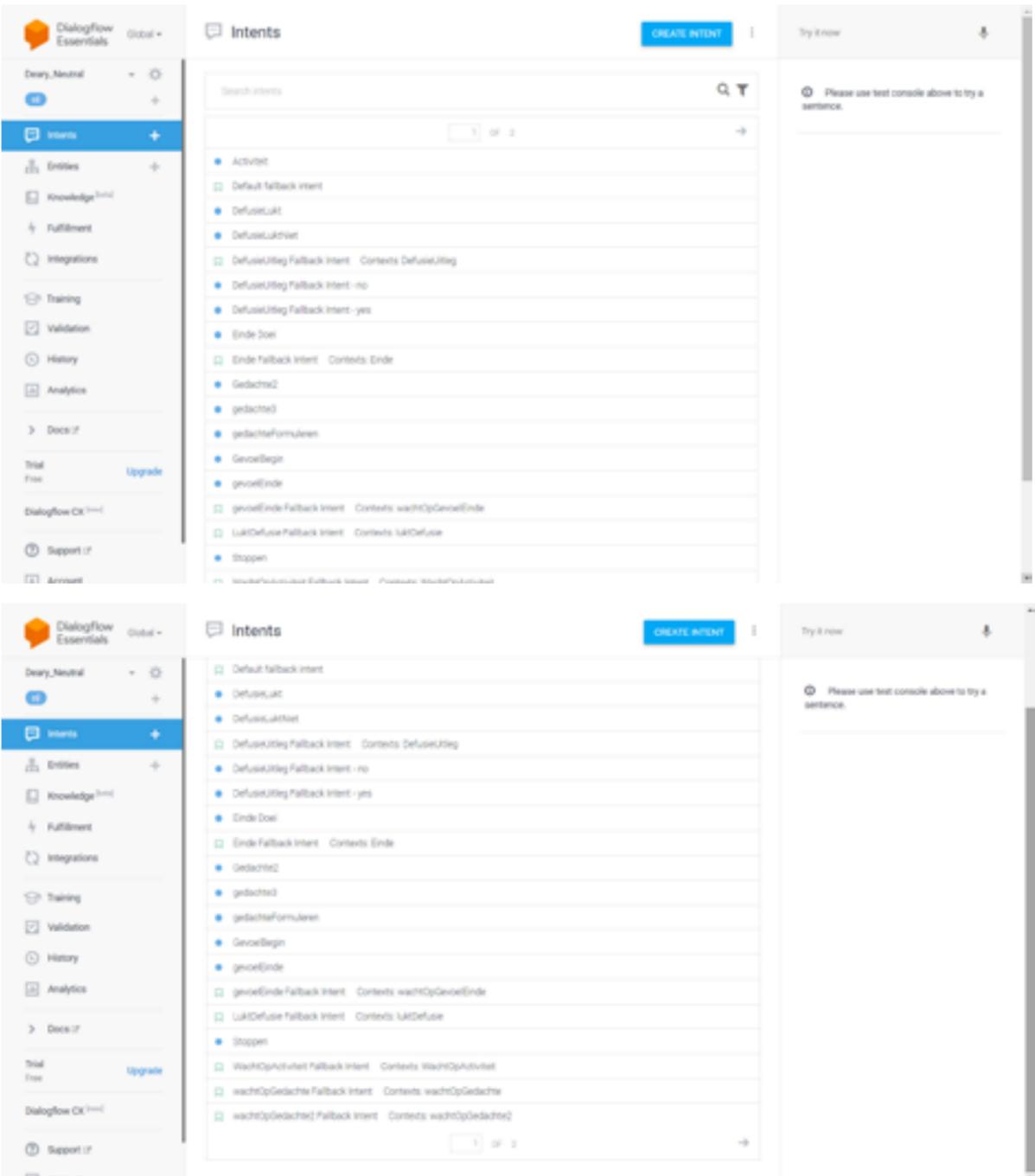
INTENT: [Stoppen](#)

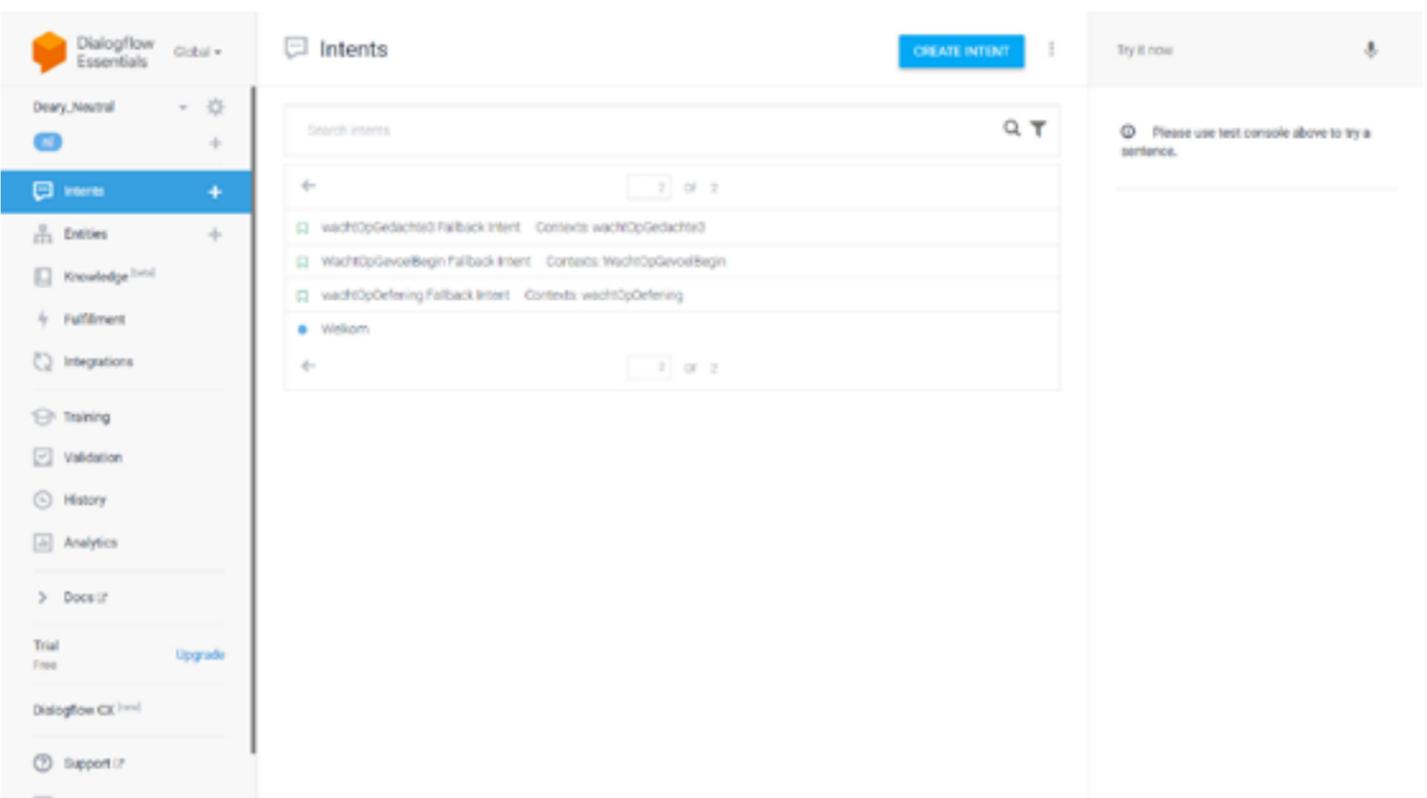
ACTION: [Not available](#)

SENTIMENT: [Query Score: 0.1](#)

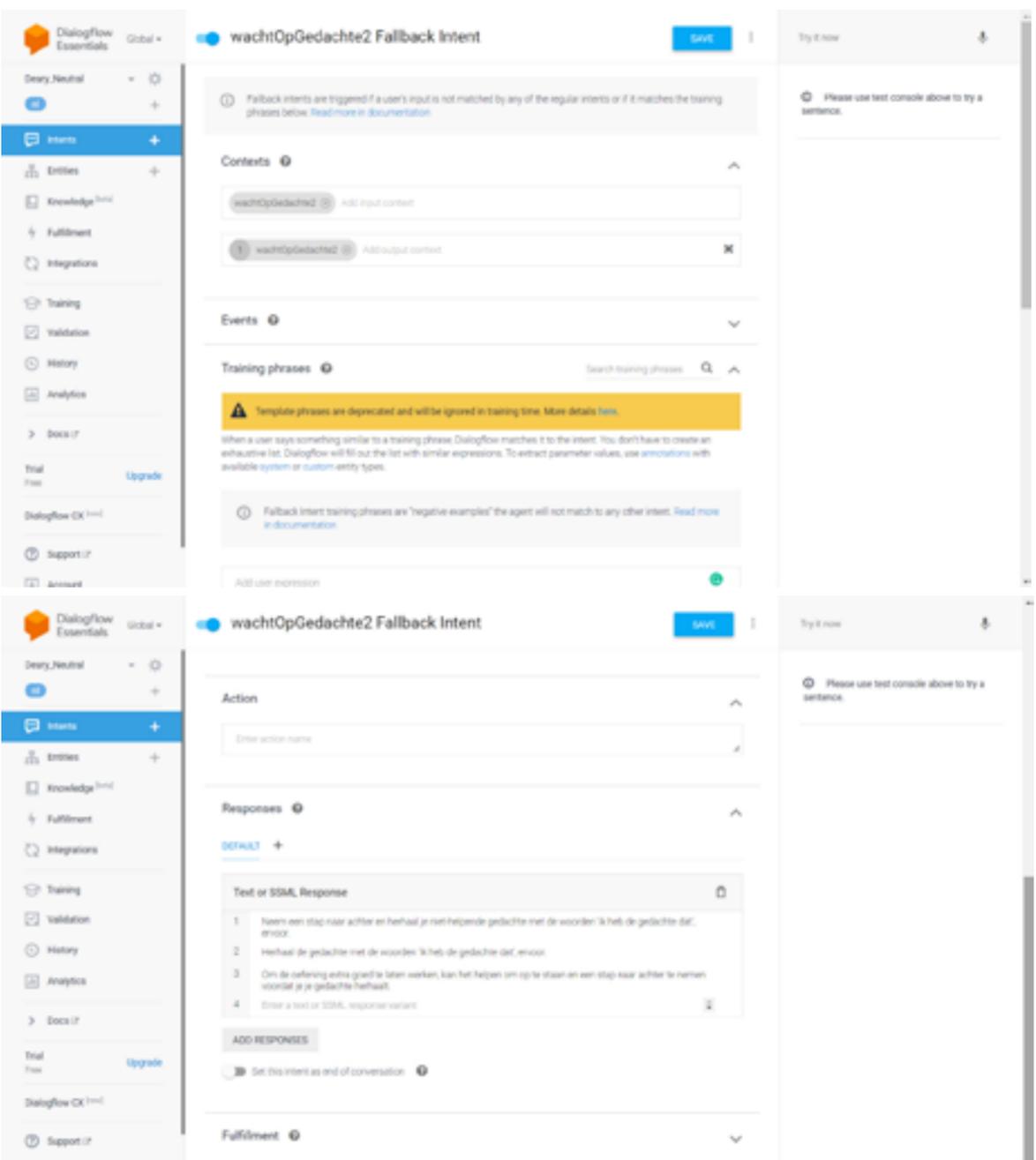
[DIAGNOSTIC INFO](#)

Deary neutral Dialogflow Intents page - 1





Deary neutral Dialogflow Intents page - 2



Deary neutral Dialogflow Waiting on thought 2 fallback intent

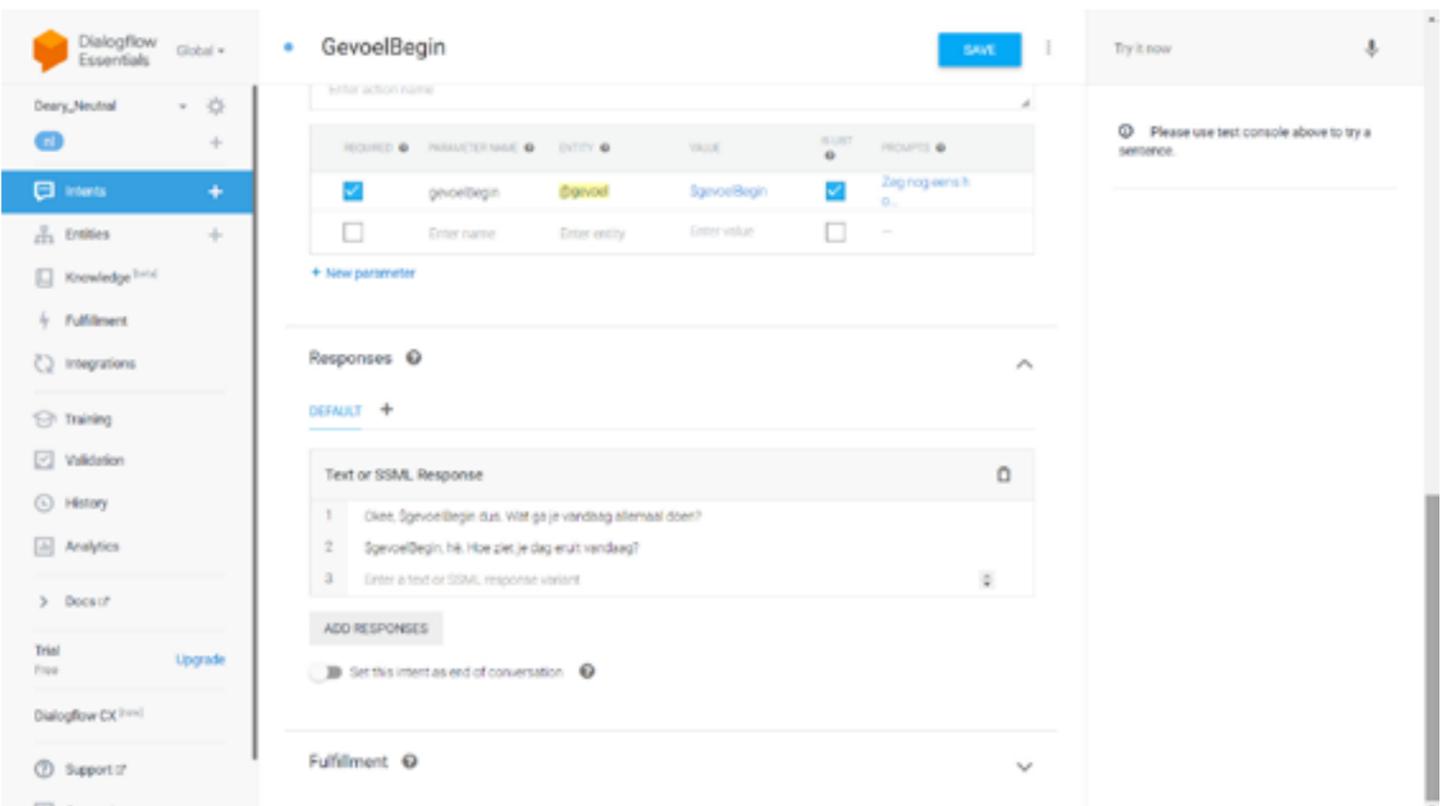
Deary neutral Dialogflow Feeling beginning intent - 1

The image displays two screenshots of the Dialogflow console interface, showing the configuration of the 'GevoelBegin' intent. The left sidebar contains navigation options: Deary_Neutral, Intents, Entities, Knowledge, Fulfillment, Integrations, Training, Validation, History, Analytics, Docs, Trial Free, Upgrade, Dialogflow CX, Support, and Account.

The top screenshot shows the 'Contexts' section with two contexts: 'WachtOpGevoelBegin' (input) and 'WachtOpActiviteit' (output) with 'gevoelBegin' as a parameter. The 'Training phrases' section contains a warning about deprecated template phrases and a list of phrases: 'ik voel me **lekker** maar wil een beetje **verdrinking**', '**verslapt** maar ook **leuk**', 'ik vind alles zo **lelijk**', and 'ik ben heel **schou** vandaag'. The 'Action and parameters' section shows a table with columns for 'Intent', 'Entity', and 'Value'. The 'gevoelBegin' intent is checked, and the 'gevoelBegin' entity is highlighted in yellow.

Intent	Entity	Value
<input checked="" type="checkbox"/>	gevoelBegin	gevoelBegin
<input type="checkbox"/>	Enter name	Enter entity
<input type="checkbox"/>	Enter entity	Enter value
<input type="checkbox"/>		

The bottom screenshot shows the 'Training phrases' section with a list of phrases: 'ik ben heel **schou** vandaag', 'Heer **lelijk** en **gelelijk**', 'ik wil helemaal, ik ben zo **ongenuit**', 'ik voel me zo **leuk**, man', 'Dit **angstelijk** eigenlijk', 'ik ben echt helemaal **leuk**', and 'ik ben **bedrukt**'. The 'Action and parameters' section is also visible, showing the same table as the top screenshot.



Deary neutral Dialogflow Feeling beginning intent - 2

Deary agree Dialogflow Entities - 1

The top screenshot shows the Dialogflow Entities management interface. The left sidebar contains navigation options: Deary_Neutral, Intents, Entities, Knowledge, Fulfillment, Integrations, Training, Validation, History, Analytics, Docs, Trial Free, Dialogflow CX, Support, and Account. The main area is titled 'Entities' and has a 'CREATE ENTITY' button. Below the title are tabs for 'Custom' and 'System'. A search bar is present, and the results list shows '@activiteit' and '@gevoel'. A 'Try it now' button is in the top right.

The bottom screenshot shows the configuration for the 'gevoel' entity. It has a 'EDIT' button and a 'Try it now' button. Below the entity name are checkboxes for 'Define synonyms', 'Regex entity', 'Allow automated expansion', and 'Fuzzy matching'. A table lists synonyms and their descriptions:

boos	boos, woedend, zedend, gedijsend, kwaad, haterijk, haerlijk, geirerd, gifig, gebeten, kritzig, driftig, verbenen, boos, woederde, zedende, gedijsende, kwaad, haterijk, geirerd, gifig, gebeten, kritzig, driftig, verbenen
bij	bij, goed, vrolijk, tevreden, verheugd, keek, pilg, opgewekt, plezierig, plezierig, gelukkig, blijmoedig, gelukkig, ecstatisch, wonderlijk, bije, beter, vrolijk, tevreden, verheugd, keek, pilg, opgewekt, plezierig, plezierig, gelukkig, blijmoedig, gelukkig, ecstatisch, wonderlijk, lekker, mooi
somber	verdrigt, sp, blauw, bedroefd, droefig, somber, triest, weemoedig, afendig, teurig, moemoedig, leuwerig, vieslijk, slecht, down, naargeestig, verdrigt, opper, blauw, bedroefd, droefig, somber, triest, weemoedig, afendig, teurig, moemoedig, leuwerig, vieslijk, slecht, down, naargeestig, ku, kuller, nA, nA, nA
angriep	bang, angstig, benauwd, huiverig, bedend, bangelijk, angstvallig, nerveus, ongerust, schuw, bang, angstige, benauwde, huiverig, bedende, bangelijk, bangig, bangig, angstvallig, nerveus, ongerust, schuw, gemoed, gemoed
leffend	leffend, lelijk, verleid, voldaan, gegene, warmhartig, warm, innig, sympathiek, leffend, lelijk, verleid, voldaan, gegene, warmhartig, warm, innig, sympathiek
verfchuld	verfchuld, walgelijk, afgewijk, huiverig, gruwelijk, verfchuld, walgelijk, afgewijk, huiverig, gruwelijk, afchuwelijk, afchuwelijk
verast	verast, beduud, van mijn A popos, verast, verast, overvallen, overrompeld, overbunden, verast, verast, verast, beduud, verast, verast, verast, overvallen, overrompeld, overbunden, verast, verast
rustig	rustig, fpi, serene, kalm, luttig, vreedzaam, vredig, overtuigd, beheerst, nuchter, veradigt, beadigt, rustig, fpi, serene, kalm, luttig,

Deary agree Dialogflow Entities - 2

The image displays two screenshots of the Dialogflow Entities management interface. The top screenshot shows the 'gevoel' entity, and the bottom screenshot shows the 'activiteit' entity. Both screenshots include a sidebar with navigation options and a 'Try it now' button.

Entity: gevoel

bangevoel	bangevoel, bangig, bangig, angstige, nerveus, ongerust, schuw, gestemd, gestressed
leedvoel	leedvoel, leedlijk, lieflijk, vddaan, genegen, warmhartig, warm, erig sympathievol, liefdevol, lieflijk, lieflijk, vddaan, genegen, warmhartig, warm, erig, sympathievol
verafschouwd	verafschouwd, weigelijk, afgezet, huiverig, gruwelijk, verafschouwd, weigelijk, afgezet, huiverig, gruwelijk, afschuwend, afschuwend
verast	verast, beduud, van mijn a propo, verbaft, verstomd, overvallen, overrompeld, overvonden, verbaasd, verwonderd, verrast, beduud, verbaft, verstomd, overvallen, overrompeld, overvonden, verbaasd, verwonderd
rustig	rustig, fijn, serene, kalm, luchtig, vreedzaam, vreed, overtuord, beheert, nuchter, veradigd, bezadigd, rustig, fijn, serene, kalm, luchtig, vreedzaam, vreedig, overtuorde, beheert, nuchter, veradigde, bezadigde, fink, lichte, dnt, okke, heide, heide
bedachtzaam	bedachtzaam, bezonnen, bedenkt, nadenkend, in gedachten, alert, doordacht, in mijn gedachten, opgenomen, bedachtzaam, bezonnen, bedenkt, nadenkende, alerte, doordacht, opgenomen
prima	prima, redlijk, mooi, gaat wel, ok, redlijk
enthousiast	enthousiast, opgetogen, nieuwsgierig, geïntrerd, geintrerd, opgewonden, belegen, begierend, jeug, fanatiek, fervent, zin, enthousiast, opgetogen, nieuwsgierig, geintrerd, opgewonden, belegen, begierende, jeug, fanatiek, fervent, Excited, beuud, beuud
verward	verward, dwars, naar, gek, in de war, warig, niet onder controle

Entity: activiteit

Define synonyms Regexp entity Allow automated expansion Fuzzy matching

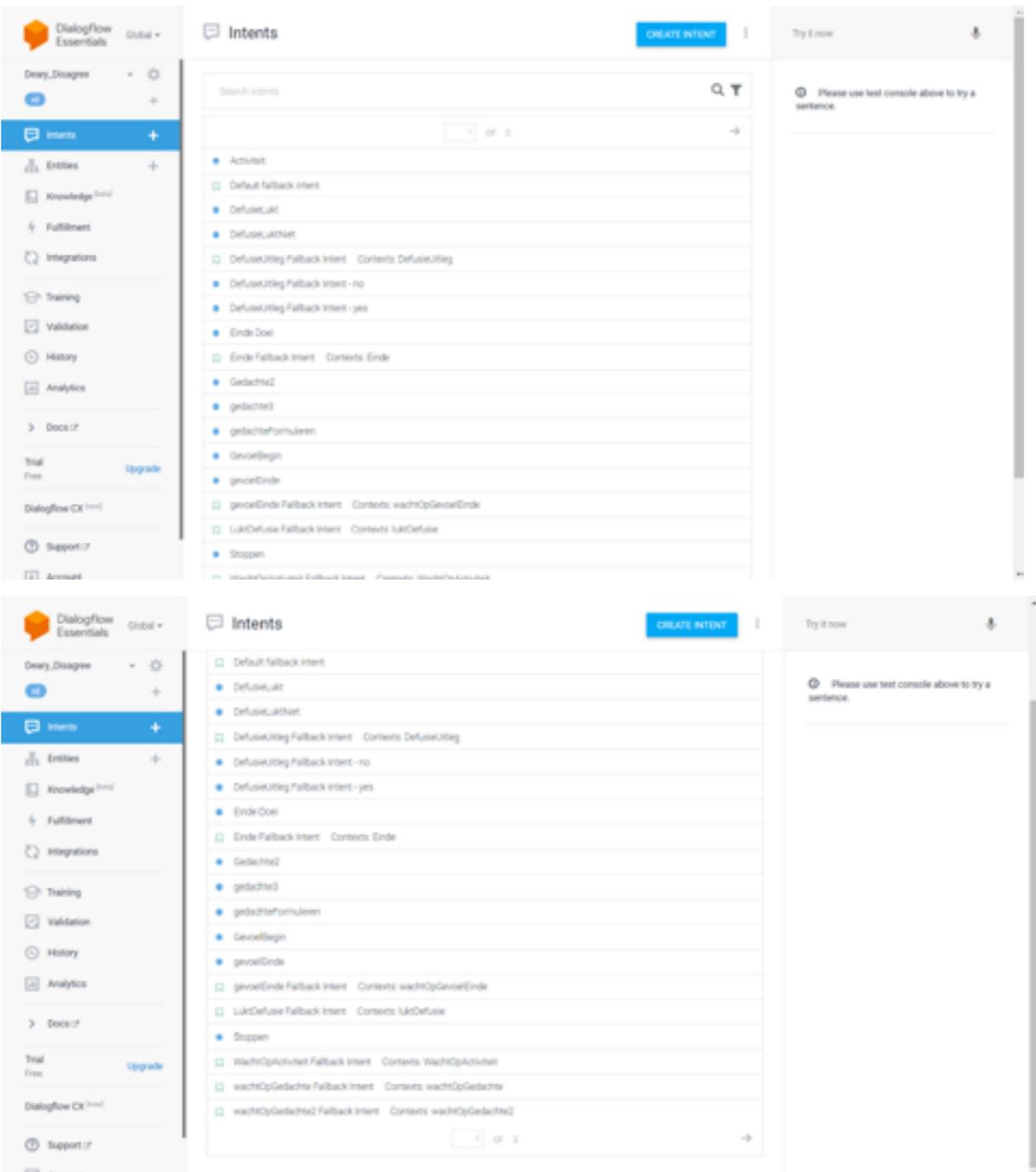
Rozen	Rozen, Spring op de fiets, Mountainbike, Mountainbike, Racefiets, Racefietsen, Rozen, Trien, Auto, Vliegug, Auto rijden, Rijden, Vliegen, Winkelen, De weg, Weggaan, De weg, Wandelen
Afspreken	Afspreken, Een vriend, Samen iets doen, Chilen, meeten
Werken	Werken, Naar werk, Aan de bak, Aan de slag, Naar kantoor, veel doen
Boodschappen doen	Boodschappen doen, Naar de winkel, iets halen, inkopen, Albert Heijn, Jumbo, Lidl, Aldi, Kruidvat, Supermarkt, Boodschappen, Weekwinkel, winkelen
Muziek maken	Muziek maken, Gitaar spelen, Piano spelen, Pianoles, Gitaarles, Drumles, Drummen, Fluten, Panfluten, Flutes, Orkest, Muzicanten, Repeteren
Dansen	Dansen, Breakdance, Ballet, Hip Hop
Koken	Koken, iets lekkers maken, in de oven, Bakken, Braden
Klussen	Klussen, Klussen, Zagen, Knippen en Plakken, Doe het zelf, timmeren
Relaxen	Relaxen, Helemaal niets, uitrusten, Zien, weinig saken, bonthangen, gemen
Sporten	Sporten, Klimmen, Boulderen, tennisen, Hockey, Voetbal, Taekwondo, Vechtsport, Hiken, Volleybal, Curling, Schaatzen, Basketbal, Handbal, Bewegen, Yoga, Naar de gym, Gym, Sportschool, Top-rijden, pisteskihoogspringen, zwemmen
Studeren	Studeren, in de boeken, huiswerk, lezen, tentamen, universiteit, lectuur, lezing, schoolwerk, school, les
naar buiten	naar buiten, naar het bos, wandelen, lopen, mijn huis uit
eten	eten, diners, restaurant, eelkook, uisten, lunchen, pizza, avondeten, soefhammet, ontbijten
Reizen	Reizen, Reizen, in de auto, vervoer, auto, vervoer

The screenshot shows the Dialogflow Essentials interface. On the left is a navigation sidebar with options like Deary_Neutral, Intents, Entities, Knowledge, Fulfillment, Integrations, Training, Validation, History, Analytics, Docs, Trial Free, Dialogflow CX, Support, and Account. The main area is titled 'activiteit' and contains a table of activities. A 'SAVE' button is visible in the top right of the main area. On the far right, there is a 'Try it now' section with a message: 'Please use test console above to try a sentence.'

Entity	Examples
Muziek maken	Muziek maken, Gitaar spelen, Piano spelen, Pianoles, Gitaarles, Drumles, Drummen, Fluiten, Panfluiten, Fluitles, Orkest, Musiceren, Repeteren
Dansen	Dansen, Breakdance, Ballet, Hip-Hop
Koken	Koken, iets lekkers maken, in de oven, bakken, braden
Klussen	Knutselen, Klussen, Zegen, Knippen en Plakken, Doe het zelf, timmeren
Relaxen	Relaxen, Helemaal niets, uitrusten, Zen, weinig, niks, bankhangen, gamen
Sporten	Sporten, Klimmen, Boulderen, tennisen, Hockey, Voetbal, Taekwondo, Vechtsport, Hiken, Volleybal, Curling, Schaatsen, Basketbal, Handbal, bewegen, Yoga, Naar de Gym, Gym, Sportschool, Top-ropen, polsstokhoogspringen, zwemmen
Studeren	Studeren, in de boeken, huiswerk, leren, tentamen, universiteit, lectuur, lesing, schoolwerk, school, les
naar buiten	naar buiten, naar het bos, wandelen, lopen, mijn huis uit
eten	eten, dineren, restaurant, eierkoek, uiten, lunchen, pizza, avondeten, boterhammen, ontbijten
feesten	feesten, feest, zupen, alcohol, jarig, drinken
slapen	slapen, naar bed, dommen, indutten, dutten
naar de badkamer	douchen, onder de douche, tanden poetsen, in bad, opmaken, make-up, me wassen
opruimen	opruimen, stofzuigen, ordenen, ramen lappen, tidy

Deary agree Dialogflow Entities - 3

Deary disagree Dialogflow Intents page - 1



Deary disagree Dialogflow

lxiv

The screenshot shows the Dialogflow Essentials interface for the 'Deary_Disagree' agent. The left sidebar contains navigation options: Intents (selected), Entities, Knowledge, Fulfillment, Integrations, Training, Validation, History, and Analytics. Below these are 'Docs', 'Trial Free' (with an 'Upgrade' button), 'Dialogflow CX', 'Support', and 'Account'. The main area is titled 'Intents' and features a 'CREATE INTENT' button and a 'Try it now' button. A search bar is present at the top of the list. The list contains four items: three 'Fallback Intent' entries for 'wachtOpGedachte3', 'WachtOpGevoelBegin', and 'wachtOpOefening', and one active intent named 'Welkom'. The 'Welkom' intent is highlighted with a blue dot and a left arrow, with a '2 of 2' indicator. A message at the bottom right reads: 'Please use test console above sentence.'

- Intents
- Entities
- Knowledge ^{beta}
- Fulfillment
- Integrations
- Training
- Validation
- History
- Analytics
- Docs ^{CF}
- Trial Free [Upgrade](#)
- Dialogflow CX ^{beta}
- Support ^{CF}
- Account

wachtOpGedachte

1 wachtOpGedachte

Events

Training phrases

⚠ Template phrases are deprecated and will be ignored in training time. [More details here.](#)

When a user says something similar to a training phrase, Dialogflow matches it to the intent. You don't have to create an exhaustive list. Dialogflow will fill out the list with similar expressions. To extract parameter values, use [annotations](#) with available system or custom entity types.

- Add user expression
- Ik vind het lastig om het te vertellen
- Even kijken
- Wacht even
- Hoe zeg ik dit?

ⓘ Please sentence.

Dialogflow Essentials

Deary_Disagree

Intents

- Entities
- Knowledge ^{beta}
- Fulfillment
- Integrations
- Training
- Validation
- History
- Analytics

gedachteFormuleren

- Hoe zeg ik dit?
- Even denken hoor

ⓘ Please sentence.

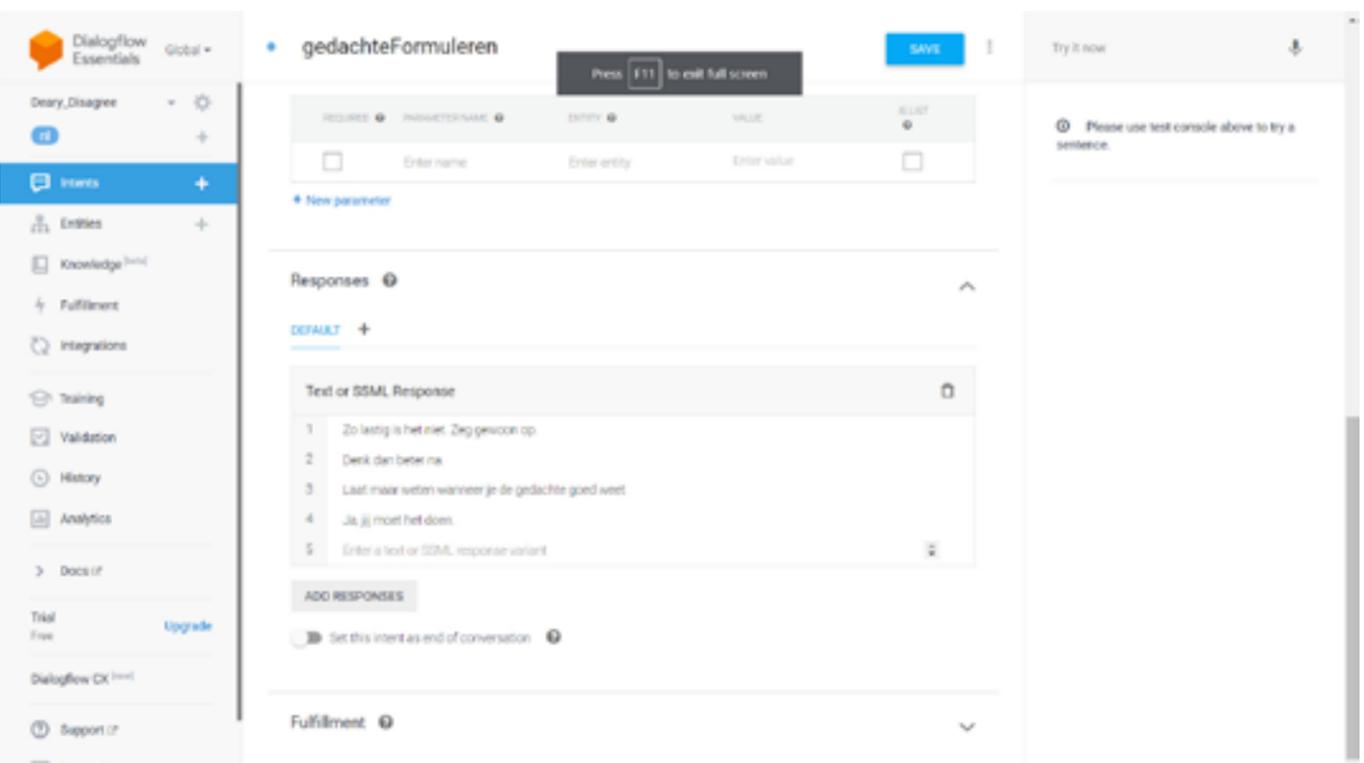
Action and parameters

REQUIRED	PARAMETER NAME	ENTITY	VALUE	IS LIST
<input type="checkbox"/>	<input type="text" value="Enter name"/>	<input type="text" value="Enter entity"/>	<input type="text" value="Enter value"/>	<input type="checkbox"/>

[+ New parameter](#)

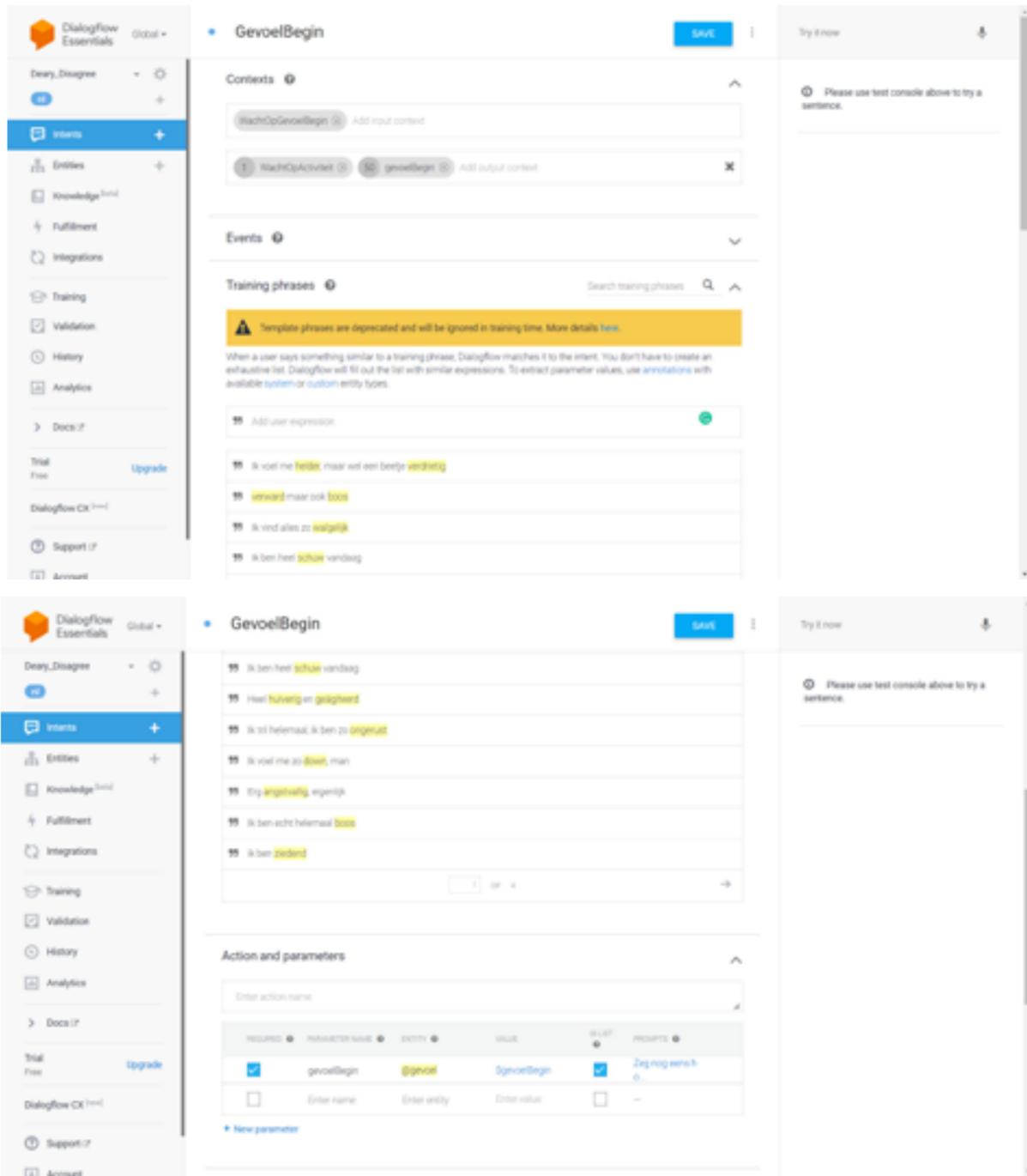
Responses





Deary disagree Dialogflow Formulating though intent - 2

Deary disagree Dialogflow Feeling beginning intent - 1



Deary disagree Dialogflow

The screenshot displays the Dialogflow Essentials interface for configuring an intent named 'GevoelBegin'. The left sidebar shows the navigation menu with 'Intents' selected. The main area is divided into three sections: Parameters, Responses, and a 'Try it now' button.

Parameters: A table lists parameters for the intent.

REQUIRED	PARAMETER NAME	ENTITY	VALUE	IS LIST	PROMPTS
<input checked="" type="checkbox"/>	gevoelBegin	@gevoel	\$gevoelBegin	<input checked="" type="checkbox"/>	Zeg nog eens h o...
<input type="checkbox"/>	Enter name	Enter entity	Enter value	<input type="checkbox"/>	--

Responses: A list of response variants for the 'DEFAULT' context.

Text or SSML Response
1 Okee. Wat ga je vandaag allemaal doen?
2 En hoe ziet je dag eruit vandaag?
3 En je hebt zeker weer een volle dag?
4 Geef een beschrijving van je dag
5 Leuk voor je. Hoe ziet jouw dag eruit?
6 Meneertje is weer \$gevoelBegin. En wat doe je vandaag allemaal?
7 Enter a text or SSML response variant

Additional UI Elements: A 'SAVE' button is located at the top right. A 'Try it now' button is on the far right. A note below it says 'Please use test console a sentence.' At the bottom, there is an 'ADD RESPONSES' button and a toggle switch for 'Set this intent as end of conversation'.

Deary disagree Dialogflow Entities - 1

The image shows two screenshots of the Dialogflow Entities interface. The top screenshot shows the 'Entities' page with a search bar and a list of entities: 'activiteit' and 'groef'. The bottom screenshot shows the 'activiteit' page with a table of activities and their synonyms.

Entity	Synonyms
Reizen	Fietsen, Spring op de fiets, Mountainbike, Mountainbike, Racefiets, Racefietsen, Reizen, Trein, Auto, Vliegtuig, Auto rijden, Rijden, Vliegen, Winkelen, Op weg, Weggaan, Ga weg, Wandelen
Afpreken	Afpreken, Een vriend, Samen iets doen, Chillen, meeten
Werken	Werken, Naar werk, Aan de bak, Aan de slag, Naar kantoor veel doen
Boodschappen doen	Boodschappen doen, Naar de winkel, iets halen, inkopen, Albert Heijn, Jumbo, Lidl, Aldi, Kruidvat, Supermarkt, Boodschappen, Weekaankopen, winkelen
Muziek maken	Muziek maken, Gitaar spelen, Piano spelen, Pianoles, Gitaarles, Drumles, Drummen, Fluiten, Panfluiten, Fluitles, Okeles, Muzicanten, Repetities
Dansen	Dansen, Breakdance, Ballet, Hip-Hop
Koken	Koken, iets lekkers maken, in de oven, Bakken, Braden
Klussen	Knutselen, Klussen, Zagen, Knippen en Plakken, Doe het zelf, smeeien
Relaxen	Relaxen, Helemaal niets, uitrusten, Zien, weinig niks, bankhangen, gamen
Sporten	Sporten, Klimmen, Boulderen, tennisen, Hockey, Voetbal, Taekwondo, Vechtsport, Hiken, Volleybal, Curling, Schaatsen, Basketbal, Handbal, Bewegen, Yoga, Naar de Gym, Gym, Sportschool, Tap-roepen, gokstokhoogspringen, zwemmen
Studeren	Studeren, in de boeken, huiswerk, leen, tentamen, universiteit, lectuur, lezing, schoolwerk, school, les
naar buiten	naar buiten, naar het bos, wandelen, lopen, mijn fuut uit
eten	eten, dineren, restaurant, eetloek, uiteten, Lunchen, pizza avondeten, Satehammen, ontbijten
Kuizen	Kuizen, Kuizen, Kuizen, Kuizen, Kuizen

Deary disagree Dialogflow Entities - 2

activiteit

Muziek maken	Muziek maken, Gitaar spelen, Piano spelen, Flansies, Gitaarles, Drumles, Drummen, Fluiten, Panfluiten, Fluitles, Okele, Muzicover, Repeteren
Dansen	Dansen, Breakdance, Ballet, Hip-Hop
Koken	Koken, iets lekkers maken, in de oven, Bakken, Borden
Klussen	Klussen, Klussen, Zagen, Knippen en Plakken, Doe het zelf, timmeren
Relaxen	Relaxen, Helemaal niets, uitrusten, Zin, weinig niks, bankhangen, gamen
Sporten	Sporten, Klimmen, Boulderen, tennis, Hockey, Voetbal, Taekwondo, Vechtsport, Hiken, Volleybal, Curling, Schaatsen, Basketbal, Handbal, bewegen, Yoga, Naar de Gym, Gym, Sportschool, Top-roepen, polsstokhoogspringen, zwemmen
Studeren	Studeren, in de boeken, huiswerk, leren, tentamen, universiteit, lecture, lesing, schoolwerk, school, les
naar buiten	naar buiten, naar het bos, wandelen, lopen, mijn huis uit
eten	eten, dineren, restaurant, eetkaak, uiten, lunchen, pizza, avondeten, boterhammen, ontbijten
feesten	feesten, feest, pupen, alcohol, party, drinken
slapen	slapen, naar bed, dromen, induten, dutten
naar de badkamer	douchen, onder de douche, tanden poetsen, in bad, opmaken, make-up, me wassen
opruimen	opruimen, stofzuigen, ordenen, nemen, lappen, tidy

+ Add a row

gevoel

Define synonyms Regexp entity Allow automated expansion Fuzzy matching

boos	boos, woedend, zedend, geïrriteerd, kwaad, hatelijk, haatvol, geïrriteerd, giftig, gebeten, kritiek, driftig, verbeten, boze, woedende, zedende, gekijwende, kwaad, hatelijk, geïrriteerd, giftig, gebeten, kritiek, driftig, verbeten
bij	bij, goed, vrolijk, tevreden, verheugd, kwek, jolig, opgewekt, plezierig, plezier, gelukkig, blijmoedig, gelukzalig, ecstatisch, vorderlijk, blij, beter, vrolijk, tevreden, verheugd, kwek, jolig, opgewekt, plezierig, plezier, gelukkig, blijmoedig, gelukzalig, ecstatisch, vorderlijk, lekker, lekkerder, mooi
somber	verdrigt, sp, blauw, bedroefd, droefig, somber, triest, weemoedig, alledig, beug, miemoedig, sneegelegener, vieslijk, slecht, down, naargeestig, verdrietig, opper, blauw, bedroefd, droefig, somber, triest, weemoedig, alledig, beug, miemoedig, sneegelegener, vieslijk, slecht, down, naargeestig, kut, kutte, ruk, rukker
ongerust	bang, angstig, benauwd, huiver, bedend, bangrijk, angstvallig, nerveus, ongerust, schrik, bang, angstige, benauwd, huiverig, bedende, bangrijke, bangig, bangen, angstvallig, nerveus, ongerust, schuw, getreud, getreude
leffevol	leffevol, levelijk, verleid, veldan, gregen, warmhartig, warm, kring, sympathievol, leffevol, levelijk, verleid, veldan, gregen, warmhartig, warm, kring, sympathievol
verafschued	verafschued, walgeijk, afgriepijk, huiverig, guweijk, verafschuede, walgeijke, afgriepijke, huiverig, guweijke, afschueijk, afschueijke
verast	verast, beduud, van mijn k propos, verluft, verstonid, overvallen, overrompeld, overlonid, verast, veronid, veraste, beduude, verluft, verstonid, overvallen, overrompeld, overlonid, veraste, veronid
rusta	rustig, fijn, serene, kalm, luchtig, vreedzaam, vrolijk, onverstord, beheerst, rustiek, veradigt, bezadigt, rustig, fynes, serene, kalm, luchtig,

G: Results cocreation

Results participatory design

Discussion interaction

Not a plushie. That is already warm and this needs to change over time.
Take with you interaction
Easy to put down

build relationship
Not something that can be in the way
easy to move
handle shock
throw or put it somewhere
Walk around
Hide and take it with you
As large as an iPad mini
Not everyone can access

A key: Something you can keep with you and put on a necklace or chain
Should look agreeable and hom-ey
Just saying things that need to come out
Not connected to the internet
Touch to activate?
The thing can say things itself

Individual making

Put down and talk
Shape with your speech
Difference in height
bean bag

Hand can rest in various locations
Movement through a wheel
Textures
People talk better when they are doing something
No rules: do with it what you like

Nice to touch
Give it body, like a stressball
Hard inside, soft outside
Push -> wake up
Fidgeting
Expression with buttons

Wood + fabric is nice
Fidgeting
Push in
Get inside it
Put down and move
Contact if you want to
Throw and put down
Fragile, don't be too hard

Making together

Ritual
Expression in material
Inherent feedback on power status
Product autonomy

Pet-like
Expression in behaviour (static/moving)
Whispering
Tuning shows setting

Room accessory
Expression in shape
Easy to make disagreeable, hard to return
Tuning shows setting

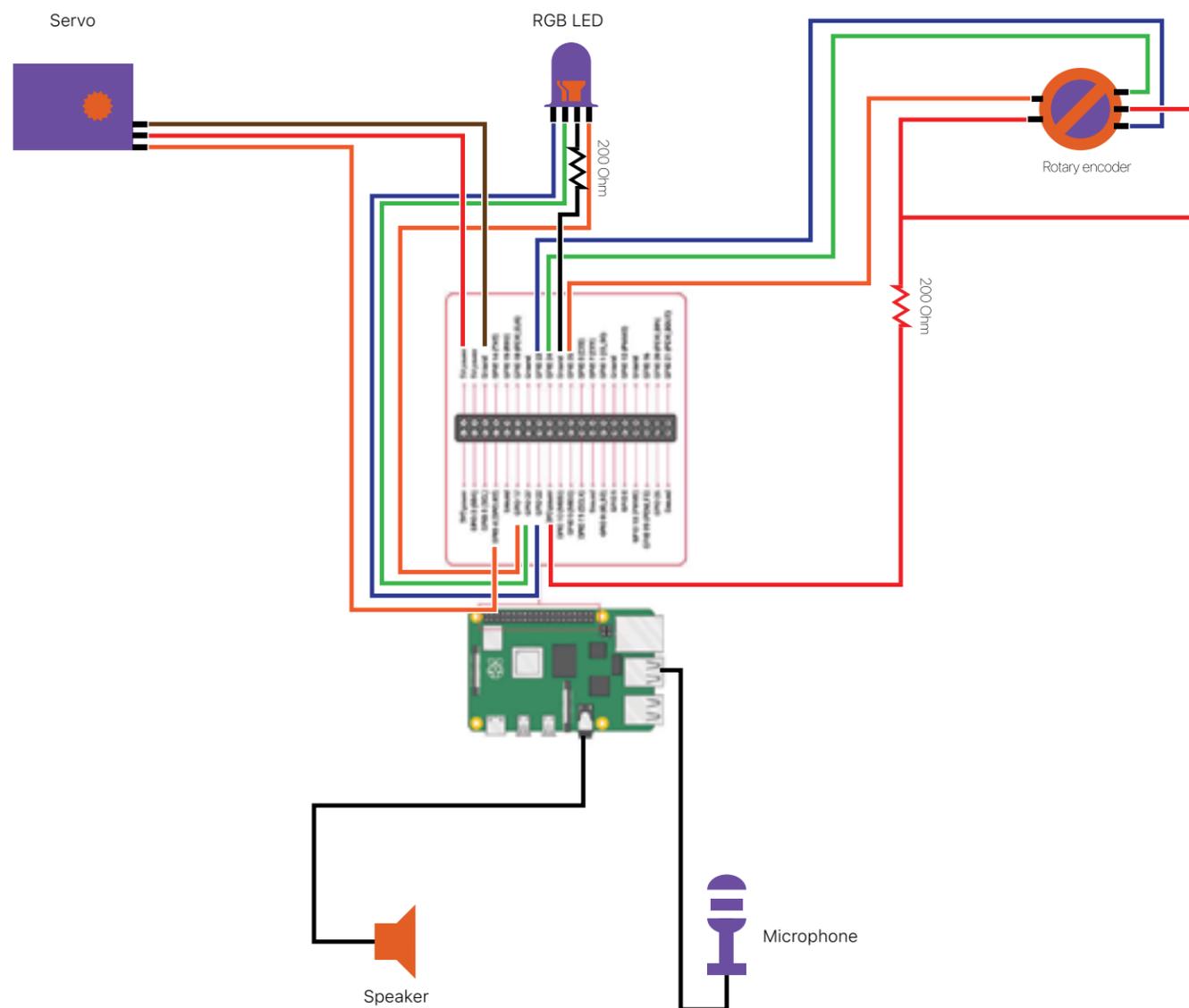
Decoratory
Expression in material
Default: agreeable, can stepwise make it disagreeable
Easy reversibility

Portable
Expression in shape
Big interaction: Whole product is the tuning

H: Wiring + code semifinal prototype

These are the links and people that helped programming the code for Deary

1. Pranav Muppirishetty. He shared a great code to set up the intent flow for Deary.
2. <https://cloud.google.com/dialogflow/es/docs/how/detect-intent-stream#detect-intent-stream-python>. And other codes on this page. For setting up the audio flow with dialogflow.
3. <https://raspberrypi.hq.com/use-a-push-button-with-raspberry-pi-gpio> for setting the button
4. <http://domoticx.com/raspberry-pi-rgb-led-aansturen-via-gpio-python/> for using the servo
5. rpi-rotary-encoder-python by nstansby on GitHub for setting up the rotary encoder
6. <http://domoticx.com/raspberry-pi-rgb-led-aansturen-via-gpio-python/> for setting up the RGB LED



no times that code was based on, check links.txt

g libraries for RGB, encoder and servo
i.GPIO as GPIO

s
e

lorsys

llowing used to be part of importing,
ike to have everything in one file.

es it possible to use the rotary encoder.

oder:

nit__(self, leftPin, rightPin, callback=None):

eftPin = leftPin

ightPin = rightPin

value = 0

state = '00'

irection = None

allback = callback

.setup(self.leftPin, GPIO.IN, pull_up_down=GPIO.PUD_DOWN)

.setup(self.rightPin, GPIO.IN, pull_up_down=GPIO.PUD_DOWN)

.add_event_detect(self.leftPin, GPIO.BOTH, callback=self.transitionOccurred)

.add_event_detect(self.rightPin, GPIO.BOTH, callback=self.transitionOccur

ositionOccurred(self, channel):

GPIO.input(self.leftPin)

GPIO.input(self.rightPin)

state = "{} {}".format(p1, p2)

f.state == "00": # Resting position

newState == "01": # Turned right 1

self.direction = "R"

f newState == "10": # Turned left 1

self.direction = "L"

elf.state == "01": # R1 or L3 position

newState == "11": # Turned right 1

self.direction = "R"

f newState == "00": # Turned left 1

if self.direction == "L":

self.value = self.value - 3

if self.callback is not None:

if self.direction == "R":

self.value = self.value + 3

if self.callback is not None:

self.callback(self.value)

else: # self.state == "11"

if newState == "01": # Turned left 1

self.direction = "L"

elif newState == "10": # Turned right 1

self.direction = "R"

elif newState == "00": # Skipped an intermediate 01 or 10 state, but if we know direction then a turn is comp

lete

if self.direction == "L":

self.value = self.value - 3

if self.callback is not None:

self.callback(self.value)

elif self.direction == "R":

self.value = self.value + 3

if self.callback is not None:

self.callback(self.value)

self.state = newState

def getValue(self):

return self.value

#importing libraries to stream audio

import pyaudio

import wave

import sys

import os

import sounddevice as sd

import time

#importing libraries to get dialogflow working

from google.cloud import dialogflow_v2 as dialogflow

from google.api_core.exceptions import InvalidArgument

import json

from google.oauth2 import *

import random2 as random

#setting up inputs for the encoder and button

buttonPin = 25;

buttonPushed = 0

encLPin = 23

encRPin = 24

GPIO.setmode(GPIO.BCM)

GPIO.setwarnings(False)

e1 = Encoder(encLPin,encRPin)

GPIO.setup(buttonPin,GPIO.IN, pull_up_down = GPIO.PUD_DOWN)

rotVal = 0

#parameters for streaming audio

CHUNK = 1024

FORMAT = pyaudio.paInt16

lxxiv

```
CHANNELS = 1
RATE = 44100
RECORD_SECONDS = 4
audio_output='/home/pi/FTP/Deary/tests/test.wav'
dialogflow_audio_output='/home/pi/FTP/Deary/tests/output.wav'
```

```
#setting up parameters to create a flow
buttonCount = 0
agent = 'neutral'
session = random.randint(1,5000000)
```

```
#Configuring RGB pins
pinRed = 17
pinGreen = 27
pinBlue = 22
GPIO.setup(pinRed, GPIO.OUT)
GPIO.setup(pinGreen, GPIO.OUT)
GPIO.setup(pinBlue, GPIO.OUT)
RED = GPIO.PWM(pinRed, 1000)
GREEN = GPIO.PWM(pinGreen, 1000)
BLUE = GPIO.PWM(pinBlue, 1000)
RED.start(0)
GREEN.start(0)
BLUE.start(0)
colorVal = (122,122,122)
```

```
#configuring servo
GPIO.setup(4, GPIO.OUT)
p = GPIO.PWM(4, 50)
p.start(6)
```

```
#defining functions
```

```
    #function to make the light gently go on
def wake_up_light():
    RED.ChangeDutyCycle(int((colorVal[0]*100)/255 *0.1))
    GREEN.ChangeDutyCycle(int((colorVal[1]*100)/255 *0.1))
    BLUE.ChangeDutyCycle(int((colorVal[2]*100)/255 *0.1))
    time.sleep(0.2)
    RED.ChangeDutyCycle(int((colorVal[0]*100)/255 *0.3))
    GREEN.ChangeDutyCycle(int((colorVal[1]*100)/255 *0.3))
    BLUE.ChangeDutyCycle(int((colorVal[2]*100)/255 *0.3))
    time.sleep(0.2)
    RED.ChangeDutyCycle(int((colorVal[0]*100)/255 *0.5))
    GREEN.ChangeDutyCycle(int((colorVal[1]*100)/255 *0.5))
    BLUE.ChangeDutyCycle(int((colorVal[2]*100)/255 *0.5))
    time.sleep(0.2)
    RED.ChangeDutyCycle(int((colorVal[0]*100)/255 *0.7))
    GREEN.ChangeDutyCycle(int((colorVal[1]*100)/255 *0.7))
    BLUE.ChangeDutyCycle(int((colorVal[2]*100)/255 *0.7))
    time.sleep(0.2)
    RED.ChangeDutyCycle(int((colorVal[0]*100)/255))
    GREEN.ChangeDutyCycle(int((colorVal[1]*100)/255))
    BLUE.ChangeDutyCycle(int((colorVal[2]*100)/255))
```

```
    #function to make the light gently go off
def sleep_light():
    RED.ChangeDutyCycle(int((colorVal[0]*100)/255 * 0.9)
    GREEN.ChangeDutyCycle(int((colorVal[1]*100)/255 * 0.9)
    BLUE.ChangeDutyCycle(int((colorVal[2]*100)/255 * 0.9)
    time.sleep(0.2)
    RED.ChangeDutyCycle(int((colorVal[0]*100)/255 * 0.7))
    GREEN.ChangeDutyCycle(int((colorVal[1]*100)/255 * 0.7))
    BLUE.ChangeDutyCycle(int((colorVal[2]*100)/255 * 0.7))
    time.sleep(0.2)
    RED.ChangeDutyCycle(int((colorVal[0]*100)/255 *0.5))
    GREEN.ChangeDutyCycle(int((colorVal[1]*100)/255 *0.5))
    BLUE.ChangeDutyCycle(int((colorVal[2]*100)/255 *0.5))
    time.sleep(0.2)
    RED.ChangeDutyCycle(int((colorVal[0]*100)/255 *0.3))
    GREEN.ChangeDutyCycle(int((colorVal[1]*100)/255 *0.3))
    BLUE.ChangeDutyCycle(int((colorVal[2]*100)/255 *0.3))
    time.sleep(0.2)
    RED.ChangeDutyCycle(int((colorVal[0]*100)/255 * 0)
    GREEN.ChangeDutyCycle(int((colorVal[1]*100)/255 * 0)
    BLUE.ChangeDutyCycle(int((colorVal[2]*100)/255 * 0)
```

```
    #function to get audio input
```

```
def write_from_mic():
    time.sleep(1)
    wake_up_light()
    print("* listening to speech...")
    p = pyaudio.PyAudio()
    stream = p.open(
        format=FORMAT,
        channels=CHANNELS,
        rate=RATE,
        output=True,
        input = True,
        frames_per_buffer=CHUNK
    )

    frames = []
    data = stream.read(CHUNK)
    for i in range(0, int(RATE / CHUNK)*RECORD_SECONDS):
        data = stream.read(CHUNK)
        frames.append(data)

    print("* done recording")

    stream.stop_stream()
    stream.close()
    p.terminate()
```

```
wf = wave.open(audio_output, 'wb')
wf.setnchannels(CHANNELS)
wf.setsampwidth(p.get_sample_size(FORMAT))
wf.setframerate(RATE)
wf.writeframes(b"".join(frames))
wf.close()
```

lxxv

```

sleep_light()

#function to play back audio
class AudioFile:
    chunk = 1024

    def __init__(self, file):
        """ Init audio stream """
        self.wf = wave.open(file, 'rb')
        self.p = pyaudio.PyAudio()
        self.stream = self.p.open(
            format = self.p.get_format_from_width(self.wf.getsampwidth()),
            channels = self.wf.getnchannels(),
            rate = self.wf.getframerate(),
            output = True
        )

    def play(self):
        wake_up_light()

        """ Play entire file """
        data = self.wf.readframes(self.chunk)
        while data != "":
            self.stream.write(data)
            data = self.wf.readframes(self.chunk)
            if data == b"":
                sleep_light()
                break

    def close(self):
        """ Graceful shutdown """
        self.stream.close()
        self.p.terminate()

def playResponse(intent):
    a = AudioFile(dialogflow_audio_output)
    a.play()
    a.close()
    if intent != 'Einde Fallback Intent' and intent != 'Einde Doe!' and intent != 'Stoppen' and intent != 'DefusieUitleg F
allback Intent - no':
        record_detect_play(DIALOGFLOW_PROJECT_ID, session_id, audio_output, DIALOGFLOW_LANGUAGE
_CODE)
    else:
        buttonCount = 0
        sys.stdout.flush()
        os.execl(sys.executable, 'python', __file__, *sys.argv[1:])

#function for detecting audio
def record_detect_play(project_id, session_id, audio_file_path, language_code):
    """Returns the result of detect intent with streaming audio as input.

    Using the same `session_id` between requests allows continuation
    of the conversation."""

```

```

write_from_mic()
from google.cloud import dialogflow

session_client = dialogflow.SessionsClient()

# Note: hard coding audio_encoding and sample_rate_hertz for simplicity.
audio_encoding = dialogflow.AudioEncoding.AUDIO_ENCODING_LINEAR_16
sample_rate_hertz = 44100

session = session_client.session_path(project_id, session_id)
print("Session path: {}".format(session))

with open(audio_file_path, "rb") as audio_file:
    input_audio = audio_file.read()

audio_config = dialogflow.InputAudioConfig(
    audio_encoding=audio_encoding,
    language_code=language_code,
    sample_rate_hertz=sample_rate_hertz,
)
query_input = dialogflow.QueryInput(audio_config=audio_config)

request = dialogflow.DetectIntentRequest(
    session=session, query_input=query_input, input_audio=input_audio,
)

# Note: The result from the last response is the final transcript along
# with the detected content.
#query_result = response.query_result
texttospeech_response(project_id, session_id, request, language_code)

#function for playing back audio
def texttospeech_response(
    project_id, session_id, request, language_code
):
    """Returns the result of detect intent with texts as inputs and includes
    the response in an audio format.

    Using the same `session_id` between requests allows continuation
    of the conversation."""
    response = session_client.detect_intent(request=request)

    print("=" * 20)
    print("Query text: {}".format(response.query_result.query_text))
    print(
        "Detected intent: {} (confidence: {})\n".format(
            response.query_result.intent.display_name,
            response.query_result.intent_detection_confidence,
        )
    )
    print("Fulfillment text: {}".format(response.query_result.fulfillment_text))
    # The response's audio_content is binary.
    with open(dialogflow_audio_output, "wb") as out:
        out.write(response.output_audio)
        print("Audio content written to file "output.wav")

```

lxxvi

```

to convert hsv to rgb
h,s,v):
le(round(i * 255) for i in colorsys.hsv_to_rgb(h,s,v))

```

```

o deary can be pushed once to be turned on and another time to have the agent selected
Count < 2:
l.getValue()

```

```

ount==1):
d < -20:
lue = -20

```

```

d > 20:
lue = 20

```

```

tVal)

```

```

ng colors and Deary settings

```

```

d <= -10:
Val = (0,50,0)
t = 'agree'
Val < 10 and rotVal > -10:
Val = (0,0,50)
t = 'neutral'
Val >= 10:
Val = (50,0,0)
t = 'disagree'

```

```

l(time.time() * 1000)%500 == 0):
.ChangeDutyCycle(int(colorVal[0]*100)/255)
EN.ChangeDutyCycle(int(colorVal[1]*100)/255)
E.ChangeDutyCycle(int(colorVal[2]*100)/255)
nt == 'agree':
ChangeDutyCycle(2.5)
gent == 'disagree':
ChangeDutyCycle(11)
agent == 'neutral':
ChangeDutyCycle(6)

```

```

tton is pressed
input(buttonPin) == GPIO.HIGH and buttonPushed == 0:
buttonPushed = buttonPushed + 1

```

```

buttonPushed = 0

```

```

ning Deary
ttonCount >= 2:
step_light()
defining which agent gets accessed
agent == 'agree':
creds_file = '/home/pi/FTP/Deary/tests/pkAgree.json'
DIALOGFLOW_PROJECT_ID = 'deary-agree-qgsq'
if agent == 'neutral':
creds_file = '/home/pi/FTP/Deary/tests/pkNeutral.json'
DIALOGFLOW_PROJECT_ID = 'deary-neutral-f9pp'
if agent == 'disagree':
creds_file = '/home/pi/FTP/Deary/tests/pkDis.json'
DIALOGFLOW_PROJECT_ID = 'deary-disagree-agfg'

```

```

etting up Dialogflow session

```

```

.environ["GOOGLE_APPLICATION_CREDENTIALS"] = creds_file
DIALOGFLOW_LANGUAGE_CODE = 'nl'
session_client = dialogflow.SessionsClient()
session_id = session;

```

```

unning the intent flow

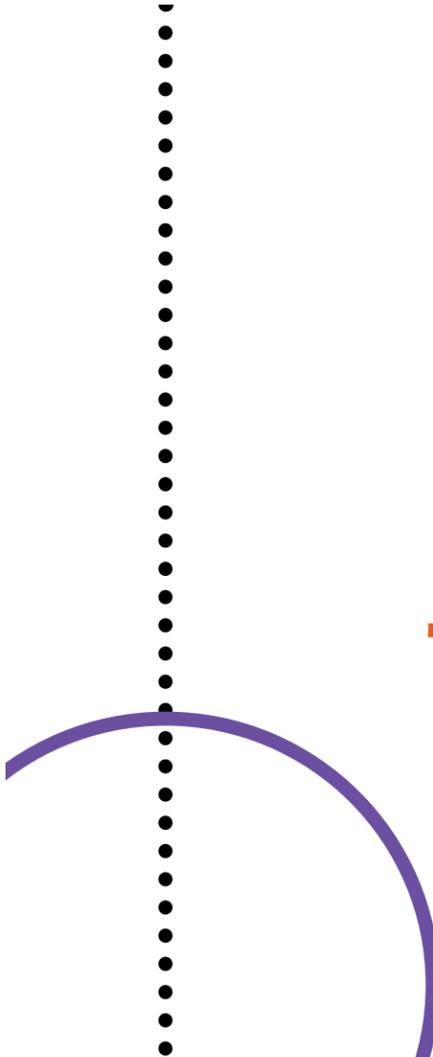
```

```

/:
#this function loops over and over again
record_detect_play(DIALOGFLOW_PROJECT_ID, session_id, audio_output, DIALOGFLOW_LANGUAGE_CODE)
cept:
    DIALOGFLOW_PROJECT_ID = 'deary-agree-qgsq'
    DIALOGFLOW_LANGUAGE_CODE = 'nl'

```

I: Cultural probe booklet 1



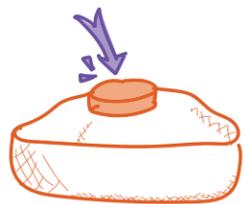
Cultural Probe Diary

ACT vierdaagse



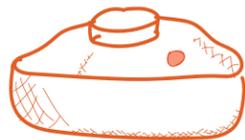
Uitleg

Je hebt dit boekje omdat je mee doet aan de 'cultural probe' studie voor Simon's eindproject. Ik vraag je om komende vier dagen mijn product, Deary, te gebruiken. Deze praat met je om je psychische veerkracht te verhogen. Per dag is er een pagina met uitleg en een met kleine opdrachten. Wees creatief.



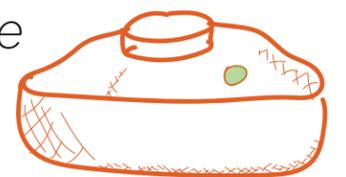
Hoe bedien je Deary?

- *Druk op de knop om hen wakker te maken*
- *Draai aan de bovenkant om de vriendelijkheid in te stellen. Een lichtje verandert van kleur*
- *Druk nogmaals om de persoonlijkheid te bevestigen en zeg iets als 'hallo'. Fijn gesprek!*



Dag 1 - uitleg

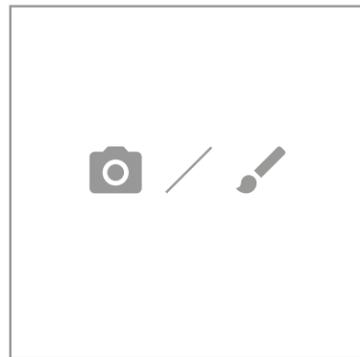
Neem 10 minuten van je dag om deze dag van de diary study uit te voeren. Stel Deary in op vriendelijk. Dat doe je door de knop naar rechts te draaien. Het lichtje moet groen worden. Start het gesprek. Deary leidt je erdoorheen.



Dag 1 - opdrachten

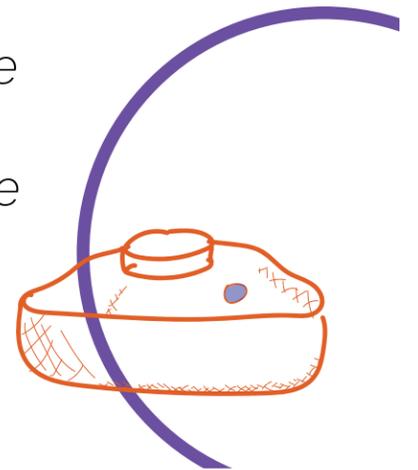
Hoe aangenaam vond je het gesprek?
Wordt je dag waardevol? waarom?
Wat symboliseert het best je dag?

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____



Dag 2 - uitleg

Neem 10 minuten van je dag om deze dag van de diary study uit te voeren. Stel Deary in op neutraal. Hiervoor hoef je de knop niet te draaien. Het lichtje is blauw. Start het gesprek. Deary leidt je erdoorheen.



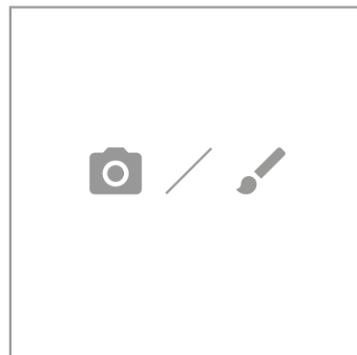
Dag 2 - opdrachten

Hoe aangenaam
vond je het
gesprek?

Wordt je dag
waardevol?
waarom?

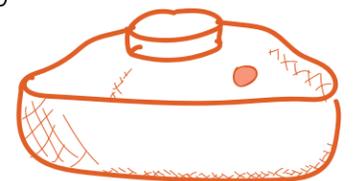
Wat
symboliseert
het best je dag?

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____



Dag 3 - uitleg

Neem 10 minuten van je dag om deze dag van de diary study uit te voeren. Stel Deary in op antagonistisch. Hiervoor draai je de knop naar links. Het lichtje wordt rood. Start het gesprek. Deary leidt je erdoorheen.



Dag 3 - opdrachten

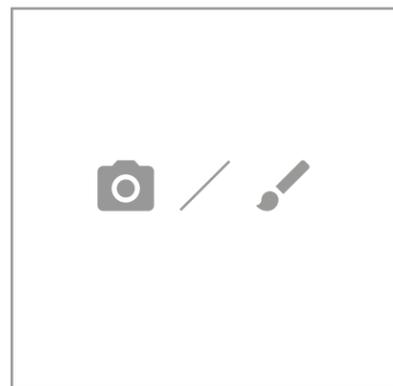


Hoe aangenaam
vond je het
gesprek?

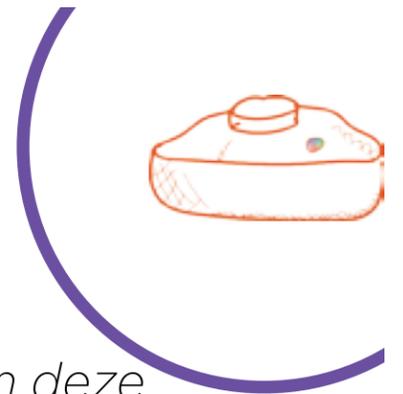
Wordt je dag
waardevol?
waarom?

Wat
symboliseert
het best je dag?

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____



Dag 4 - uitleg



Neem 10 minuten van je dag om deze dag van de diary study uit te voeren. Stel Deary in zoals je zelf wil. Kijk eventueel terug naar vorige dagen voor de instellingen. Start het gesprek. Deary leidt je erdoorheen.

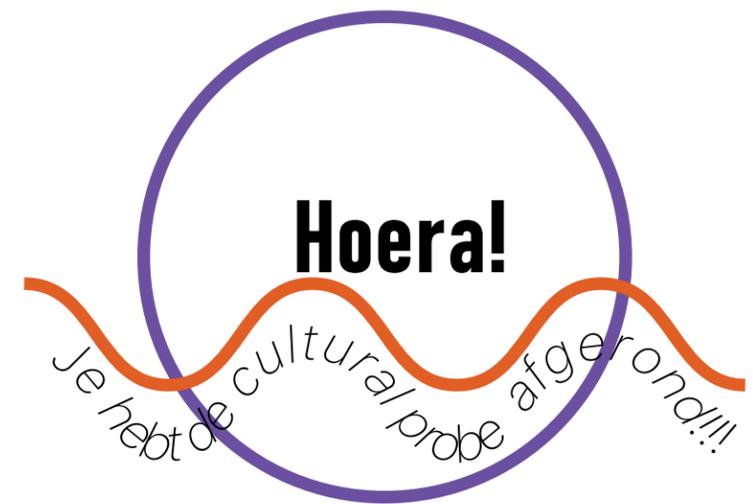
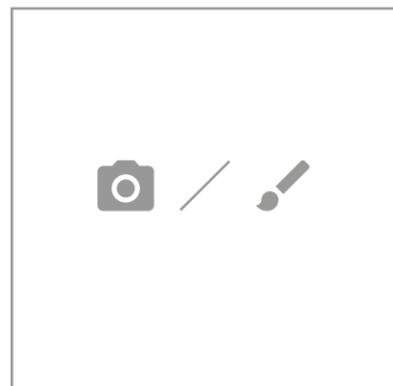


Dag 4 - opdrachten

Hoe aangenaam
vond je het
gesprek?

Wordt je dag
waardevol?
waarom?

Wat
symboliseert
het best je dag?



Laat het weten aan Simon. Hij komt binnenkort langs om de spullen op te halen en voor een klein interview.

J: RS-NL Questionnaire

1/11/22, 2:30 PM

Vragenlijst Veerkracht

Vragenlijst Veerkracht

Als je je ergens niet comfortabel bij voelt, vul het dan niet in!
let op: de schaal gaat van klopt helemaal WEL naar klopt helemaal NIET.

***Vereist**

1. Wat is jouw naam? *

2. Als ik een planning maak, voer ik deze uit

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

3. Ik red mezelf meestal wel

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

4. Ik kan meer op mezelf rekenen dan anderen dat kunnen

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

1/11/22, 2:30 PM

Vragenlijst Veerkracht

5. Ik vind het belangrijk om interesse te blijven hebben in dingen

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

6. Ik kan alleen zijn als dat nodig is

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

7. Ik ben trots op de dingen die ik heb bereikt in mijn leven

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

8. Ik kan omgaan met onverwachte problemen

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

9. Ik ben tevreden met mezelf

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

10. Ik kan omgaan met veel dingen tegelijk

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

11. Ik weet wat ik wil

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

12. Ik twijfel aan de zin van het leven

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet



13. Ik pak problemen aan die ik tegenkom

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

14. Ik kom door moeilijke momenten heen omdat ik al eerder moeilijke momenten heb meegemaakt

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

15. Ik heb zelfdiscipline

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

16. Ik blijf geïnteresseerd in dingen

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

17. Ik kan zelfs in moeilijke tijden wel eens lachen

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

18. Ik geloof in mezelf en dat helpt mij in moeilijke momenten

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

19. In een noodgeval kunnen mensen op mij rekenen

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

20. Ik bekijk een situatie op meerdere manieren

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

21. Ik kan mezelf dwingen dingen anders te doen, ook als ik daar geen zin in heb

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

22. Mijn leven heeft zin

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

23. Ik blijf niet stilstaan bij dingen waar ik niets aan kan doen

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

24. In een moeilijke situatie vind ik altijd een oplossing

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet



25. Ik heb genoeg energie om te doen wat ik moet doen

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

26. Het is niet erg dat er mensen zijn die mij niet leuk vinden

Markeer slechts één ovaal.

1 2 3 4 5

Klopt helemaal Klopt helemaal niet

Deze content is niet gemaakt of goedgekeurd door Google.

Google Formulier

lxxxvii

K: Transcriptions + themes cultural probe

Participant 1

Interview cultural probe.

Research questions: Does using the product affect attitudes towards standardization of conversational AI products?

Setting: at participant's home. 1 interviewer, 1 interviewee

Duration: 30 min

Protocol: unstructured; as a discussion; voice and notes taken

Method: RQ is answered based on duration and engagement of the discussion

Questions

1. What did you think of using Deary?
2. What was your favorite personality setting?
3. What was your reaction to being able to change how Deary acts?

4. Did you have experience with using conversational AI tools before using Deary?
5. For what purpose did you use those?
6. Has using Deary affected your opinion about conversational AI products?
7. What would you say is the difference between Deary and the conversational AI tools you used before?

8. Which kind of conversational AI tool do you think will have a better user experience?
9. What do you think the future of human-centered AI tools will look like?
10. Do you think humanness is a positive factor in AI products?

11. Did Deary feel trustworthy?
12. Who was in control of the interaction: you or Deary?
13. Did the changeability of personality affect your trust in Deary?
14. Did you feel aware of the capabilities of Deary?
15. Did you feel like the functionality of Deary was relevant?

Resilience score (scale 1-5)

Before: 3,8

After: 3,68

Cultural probe questions

Day 1 (agreeable)

How pleasant was the conversation?

It takes some getting used to and it is a bit robot-like in the language interaction. But the content was surprisingly good. I am deeply interested.

Will your day be valuable? Why?

I think that I did it a bit too late today (right before going to bed), but for now it was mostly valuable as something new and fun, something exciting.

Photo / drawing

Photo (P took this as passive)

Day 2 (neutral)

How pleasant was the conversation?

It felt a bit the same like last time. I found it more funny for some reason.

Will your day be valuable? Why?

I had a good day today! I don't know whether it is because of Deary, but my day was valuable.

Photo / drawing

Drawing (P took this as active)

Day 3 (disagreeable)

How pleasant was the conversation?

Not really pleasant. I felt like I needed to initiate and guide the conversation.

Will your day be valuable? Why?

No, because Deary was disagreeable, I wanted to be disagreeable myself too and said no to the assignment. I expected that Deary would do it anyway, but he just said 'bye' and was gone (haha)

Photo / drawing

Drawing (P took this as active)

Day 4 (neutral)

How pleasant was the conversation?

Not really pleasant. But that was mainly because Deary couldn't hear me well. I needed to reiterate everything a few times.

Will your day be valuable? Why?

It actually helps a bit to do such a meditative exercise to make your thoughts relative. It helps with unwinding.

Photo / drawing

Photo (P took this as passive)

lxxxix

Notes made during the interview

Duration: 42m42s

R: What did you think of using Deary?

P: I liked it, it was new for me. I also was curious, for example during the first conversation: what will be the next question? It felt more like an actual conversation than with other conversational AI tools. The content did feel a bit forced, maybe that will always be the case with these kinds of technologies. It was fun to do.

R: Was using the product a new experience for you?

P: Well, I have done some meditation towards letting go of feelings, but not out loud and with taking steps back. During the days, I mostly but not always did that step back, as instructed. Sometimes I leaned a bit in because it could not understand me. It was hard to know when to talk.

R: Did you have experience with using conversational AI before Deary?

P: Not often. When Siri was becoming a thing I tried it out, not really with a purpose. Sometimes I use Siri to look things up. However, it does not have the advantage of a conversation. My roommate also has a Google mini that you have to command via voice. It is funny to ask it something, but it becomes frustrating quickly. It is a bit unlogical. For example, when I ask at what time the train leaves it just sums up an array of trains.

R: would you then say that Deary is more logical?

P: Well, it is more narrow. Within its niche, it is better in terms of conversation.

R: Okay, what was your favorite personality setting?

P: I expected that it would be the most negative setting, as I thought it would be funny. On day three, when I used that setting it actually was quite short because it got me in an antagonistic mindset which made me not want to do the exercise. It surprised me that it just said "okay" at that point.

But my favorite one was neutral. It was the nicest. Agreeable was a bit too patronizing.

R: and what setting did you use last day?

P: Neutral.

R: What are the differences between Deary and Siri?

P: Deary is more human-like. Siri always just fulfills your request, which is inhuman. That social tension is important. Social aspect gives humanness, which causes engagement. For example, a meditation app with prerecorded stories is just something you listen too. This feels more personal and versatile.

R: Do you think humanness is a positive factor in AI products?

P: practically, yes. It makes it chiller to have a conversation. But philosophically, it's scarier. Where is the divide between humans and AI? Should we break it? AI is useful, but shouldn't feel like a human conversation. That would not be true.

R: Did Deary make you think of this philosophical aspect?

P: Yes. I had to really experiment to see what it could do. Sometimes I needed to remind myself quickly that I was talking to an AI.

R: How do you think your relationship with Deary would change if you would use it for a longer period of time?

P: I think I would compare it to an adult version of a teddy bear. You form this emotional bond of which you feel that it is reciprocal, but deep down – I think that is also the case with children and teddy bears – you know that it is not real. If it learns over time, it would feel more like a friend.

R: Would you prefer Deary to be a bit distant, or would you like them to get to know you a little?

P: It would change the purpose. If it learns, it would be more like the teddy bear whereas if it stays distant, it would feel more like a tool.

I am curious what it would be like if Deary actually uses your input in further conversations. But for defusion, I think having it as a tool would be better.

R: Do you have any experience with a psychologist?

P: no

R: Did Deary feel trustworthy?

P: There is a divide between the voice and the AI behind it. The voice is a sort of façade to what is behind in that way. The voice felt trustworthy, but I couldn't really see what was behind the voice, as if you were looking at a human.

R: Did the changeability of personality affect your trust?

P: That's difficult.. Because I could decide myself, it felt like I was in control. But it still was some leap afterwards: you don't know how the conversation was going to go. I did trust, however, that Deary would guide me well.

XC

R: Would a sort of preview maybe help in that case?

P: It would make the system more trustworthy. Knowing what will happen would decrease the threshold for using a particular setting for the first time.

R: Who was in control of the interaction: You or Deary?

P: It was a two-player game. We both had partial control. I set the borders and within those borders we had an even amount of control. In the end, that would make me more in control in total.

R: Did you feel aware of the capabilities of Deary?

P: Not totally. I am curious as to how many sides the conversations could have gone to. I already have that now. If it would be a real thing, it would be even more exciting in that way. The not knowing actually makes it interesting and human-like. It surprises you with their reaction like Siri would not be able to.

Discussion

P: I'm curious: if I would buy it if it would be something to use later. It is interesting on a purely linguistic level. I wouldn't buy it for its function. And it is quite intimate because it stays between the product and the user.

R: A bit like a diary?

P: I would use it more for the experience than the use. Its use could be a diary, meditation help or perhaps even a dream catcher!

R: And if it would become a standard in technology?

P: Then more for the function.

R: And did you feel sure that it wouldn't share your data?

P: Well, I trust you for it. If a random person gave it to me I wouldn't know. It is connected to the internet, of course, as the computing is in the cloud. It is kind of this black box idea.

R: What was the most exciting part of the experience?

P: Actually, the first interaction. I was a bit hesitant to say hello because I didn't know what to expect. I had that with all settings. The third day was funny as well. But at the same time I knew that it wouldn't remember or respond to anything I said to it in a surprising manner, which would actually be interesting.

P: I also experienced the personality as if it were a person playing an archetype, like I knew the AI but not the way it acted.

R: Did the experience feel objective?

P: Yes, it can't have any own initiative, as that is really hard to program. If you were to program freedom, you would need to program an infinite amount of rigid options.

xci

Toestemmingsformulier proefpersoon

Cultural probe studie Deary

- Ik heb informatie gekregen en ik begrijp waar dit onderzoek over gaat. Ook kon ik vragen stellen. Mijn vragen zijn voldoende beantwoord. Ik had genoeg tijd om te beslissen of ik meedoe.
- Ik weet dat meedoen vrijwillig is. Ook weet ik dat ik op ieder moment kan beslissen om toch niet mee te doen of te stoppen met het onderzoek. Daarvoor hoef ik geen reden te geven.
- Ik weet dat sommige mensen mijn gegevens kunnen inzien. Die mensen zijn Simon de Vries en Yaliang Chuang.
- Ik geef toestemming voor het verzamelen en gebruiken van mijn gegevens voor wetenschappelijke publicaties en meer of ander onderzoek op mijn gegevens.
- Ik geef toestemming om mijn gegevens op de onderzoekslocatie nog 15 jaar na dit onderzoek te bewaren.

Ik wil meedoen aan dit onderzoek.

Naam proefpersoon:

Handtekening: _____ Datum : __ / __ / __

Ik verklaar dat ik deze proefpersoon volledig heb geïnformeerd over het genoemde onderzoek.

Als er tijdens het onderzoek informatie bekend wordt die de toestemming van de proefpersoon zou kunnen beïnvloeden, dan breng ik hem/haar daarvan tijdig op de hoogte.

Naam onderzoeker (of diens vertegenwoordiger):

Handtekening: _____ Datum: __ / __ / __

De proefpersoon krijgt een kopie van het getekende toestemmingsformulier.

xcii

Participant 2

Interview cultural probe

- Research questions: Does using Deary let users reimagine the human-AI relationship in the near future?
- Setting: at participant's home. 1 interviewer, 1 interviewee
- Duration: 30 min
- Protocol: unstructured; as a discussion; voice and notes taken
- Method: RQ is answered based on:
 - Duration and engagement of the discussion
 - Answers to the questions, after thematic analysis

Questions

- What did you think of using Deary?
- What was your favorite personality setting?
- What was your reaction to being able to change how Deary acts?

- Did you have experience with using conversational AI tools before using Deary?
- For what purpose did you use those?
- What was your standpoint about conversational AI products at that point?
- What would you say is the difference between Deary and the conversational AI tools you used before?

- Who was in control of the interaction: you or Deary?
- How well did Deary fulfill its purpose?
- How personal did the interaction with Deary feel?
- What would let you use a product such as Deary?

- Do you think AI will be used for more personal purposes, like therapy, in the future?
- What do you think of this? Is this preferable?
- What would such a world look like?
- How do you think AI will influence the world in the near future?

ing to interview you about your use of Deary. In doing so, we are going to ss what you found of the look and feel of the package you received, how you using it, what you think about conversational AI in general, how trustworthy und it and what you think about the future of AI.

talk in English, because my questions are in English.

mate

it, mate

lk about an introductory question. Let's go back to when I delivered Deary to

was your initial thought when you received Deary?

It looks nice. I liked how it came in a little compact box with some texture and I was st

Good to hear.

the interaction fit the fun-looking look of Deary? The way that you tuned it and th.

It is nice that it had a smiley face on it. That already hints to that you have a friendly rsation with it.

ow was it to use it? Did you come across any difficulties?

a bit difficult to use, especially when I couldn't see the LEDs in the lights. Then I ha my hand over it to see if it registered and stuff. Often times it wouldn't listen and it remain quiet for three minutes and then talk again. That was a little difficult to keep rsation going.

Imagine

se you don't know what's going on. So I had to reset a few times. But that's okay.

saw that in your user diary. But nonetheless you said that, especially on the ay, it gave you some time to reflect on your day, right?

However I only noticed the second day that I didn't experience the full thing. Becau: it asked me to do an exercise, I said yes. Then it just said 'okay, I can't do anything ymore'.

? Haha. Was that on the first day or on the second day?

First day. But I didn't know what was going to happen, so I just thought: "okay, well mind then".

Okay, yeah. And when you actually got to experience the exercise, what did you think of that?

Well, so when I did the exercise on the second day it couldn't hear me. So I stepped back and then it just said again "take a step back". So in the end I was up against the wall. But I don't know, it's...

I can imagine that it is not such a good experience to be pushed against the wall...

Yeah so it is a little difficult to judge whether the exercise was good for me or not.

Because it just didn't work then?

Yeah. It just had you thinking about a lot of other things instead of thinking about what the exercise is about. But I think it is nice to take a moment to think about ...

Thoughts?

Yeah

Did the exercise come through a bit better on the third or fourth day, or did these issues remain?

The third day it was less bad. The conversation went pretty smoothly.

How was that?

It was good, but I didn't really have a thought to do the exercise with at that time. I liked the third day, how it was a bit different from a google home or something. I think because of that personality.

That's already a good bridge for the next section. You mention that it is different from, for example a google home.

What do you think those differences are?

Mainly on the antagonistic one, it really felt like there was a special or fun personality, which made it a lot more interesting and which set it apart from this talk to a machine.

What would you say made this conversation interesting?

The jabbing actually. It was kind of making fun of you, instead of you just making fun, like "haha, dumb computer".

So kind of also a role switch in that sense?

Yeah

What would you say is the difference between Deary and a conversational AI. Is it the personality, or also some other things?

Of course the personality, but also it has a very specific purpose. So you kind of go into the conversation with a purpose, so you know what you are going to do. I think it is good for something like this. Because it is an exercise to think about your thoughts, I think it is good to have that separate from, like a google home that can do everything. Because it creates a special moment.

Okay. Nice to hear. A while back when you were talking about being pushed up against the wall by Deary, you mentioned that you had a lot of other thoughts instead of the conversation.

xciii

Could you elaborate on what you were thinking at that point?

Is this thing listening to me? Does it hear what I am saying? What is it thinking? Does it understand me correctly? Because I was just screaming: “yes, yes”. Thinking about different combinations to say yes, and then it would say: “say yes or no”.

Hahaha. YES. Alright Then let’s go back to the very specific purpose aspect and that you thought it was good.

Did you also think that there was an influence on your user experience because you were given a user manual at the beginning?

It told me how to start up the device. That is the main thing. For the rest not that much. Maybe that I took it out of the power also because I knew it had a microphone and a connection to the cloud. But not too much, I think.

Therapy is quite a personal topic to talk about with a conversational AI. Would you say that that also influenced your relationship to Deary? Or the kinds of things you were thinking?

It might be a bit lower threshold than talking to a real person. You know that it is just a machine and stuff, but it can still help you in a similar way. Maybe not replacing human contact but supplementing it.

I notice that you are thinking about Deary on a pretty functional level. Like it is helping you with this and that and how it did or did not do that.

Do you think AI like this can have more therapeutic purposes in the future? Or do you think things like Deary can pop up in the future?

I think so. I think it is a really good thing to have something that can help you get back into your thoughts and into the world again.

So separating your inner world and the outer world, and this can kind of be an interface to get you back between those two.

Yeah like: “what am I thinking?” and “why?” and “what does this even mean?”

And also with the lower threshold and the functional aspect, that would help.

And do you think it is preferable if people would have therapy with robots, basically?

No, I think as a supplement, it can be. Or as a first thing. But it shouldn’t mean that human therapy would disappear. Or should disappear.

Kind of a direct question:

Did Deary let you think about these things of: “How can AI actually be different from now, in the future?” and “how can it supplement human contact?” or “How can relationships between humans and AI change in the future?”

Uhuh. But what I would hope is to get an AI that is a bit more personal to you. Maybe it would have some random personality when you first get it, or it could grow with you. That would be nice, because then it also is something a bit more personal to you. Which I think would make it more fun and more close to you.

In that sense it would be better if some thing decides its personality instead of you, then?

Yes.

But you could imagine that people have these more personal robots or AI tools to guide them in the future.

Yes.

What would such a world look like for you?

Not that much different. I think people might have a short talk when they go to bed or when they wake up, something like that.

That’s nice, yeah. And would these Ais be in a physical embodiment like Deary, or would they be in an app, or does that even matter?

I think a physical thing would be best because you have something to focus your attention to, But it could also just be something else. Like an ominous voice to loom. Because of course, our perception of what a conversation is also changes. So we might get used to talking into the void.

How do you think our perception of what a conversation is would change? And what would cause that change as well?

I think right now it is still nice to have a face to talk to. We can also see that at the beginning of the pandemic it was really weird to talk online. But now seeing you on a screen is not that weird anymore. So I think that talking to a box still feels weird when I have a google home. But that might change. And similarly, we might not even need to see a face or anything that we’re talking to. We might just talk anywhere and any direction. Yeah, weird.

So just ... But in a way, this might also take away the human aspect of talking or something, because if you’re talking to a human – except if it’s through a phone or something – you still would know that you are talking to a person.

How would it feel, or actually how did it feel, for you to talk into a black box that generates answers rather than a distinct personality?

I think it can be nice that it is not a real person because ofr yourself it then doesn’t matter what you say.

So then it kind of removes these social implications of your speech maybe.

Yeah.

Okay. This also goes into a thing I wanted to talk to you about: trust.

How trustworthy did Deary feel to you?

Well, that’s difficult to answer, I think. It did not always understand me correctly. For example, I would say a few things and then it would say: “so you’re gonna work, right?” and I was like “no.”. So it didn’t always feel like it was understanding me. So in that way I couldn’t keep all my deepest darkest secrets with it and feel really happy with it. But on the other hand, it did make the idea that it didn’t really matter what I was going to say a bit greater. In the end that’s also good because it is about reflecting on yourself and not on about what the machine thinks.

Do you envision other uses where a personal AI could help apart from this therapy, going away from your thoughts?

xciv

...ually what conversational AIs are doing now anyway, but building a bit more natural and building on what you were saying in previous conversations, right?

...an almost round it off.

...would let you use a product like Deary? What would let you take a product such as Deary in your home?

I don't know. At the moment I would not get something like that. That is also due to the fact that the technology is not really there yet. Because I have a Google Home but it just sits on my couch and I never talk to it. Just because the experience is not great. So I think the most important thing is that it flows naturally, that you don't have to wait on the machine, you and that you don't have to repeat yourself.

...more natural conversational flow would already really help.

...based on your previous answers, I think you would also like this product to have a bit more of a personal aspect rather than the AI tools that are existing now, right?

...I put it in for you a bit. I hope that was not too bad. See if I have some other questions that I really want to ask you. Do I have all my information? One more topic: the relation between the personality setting of Deary and how trustworthy it felt.

...do you think the way you were in control of how Deary would act gave you a bit more control by knowing what would happen?

...it is a really interesting concept that you are physically able to change it with an easy elementary switch thing. It gives you some sort of power over the computer, which might be good because after all it is a computer and there are a lot of thoughts about "AI is going to take over the world" and stuff. I think this simple thing in which you change what the personality is really nice. Also linking that to personality seems like a really good choice because you can change it according to your mood. The AI is not always able to see your mood or see into your thoughts. So then you have that control of: "I feel it this way, so I will change the personality to this".

...rough physical control over the AI, it also gives a more trustworthy experience because you literally control the AI?

...ever you also talked about that you would like the computer to change its own personality. How would you think both the control and the automation would be implemented?

Yeah.

And more about changing personality based on its experiences with you.

Yeah.

But on a more basic level about the personality. How would you think the personality would be automated or randomized, anything out of human control while also getting the same sense of control that you had right now?

Maybe it would use a certain type of language or some words that it likes to use.

Aha!

Because humans have that. Every now and then we have a certain word that we like and then it fades away and comes back some times.

O that's nice

The same goes for a way of speaking. Because of course, these language processing AIs go very generalized. An average human, let's say. I think it would be interesting if they go a bit more on their own routes or on their own way of speaking.

Alright. Do you have any closing thoughts? Or anything that you like to tell, or discuss? I'll go through your Diary one more time. O yeah!

One important question is: even though the product didn't function as intended, do you think it still gave you some sense of value?

I think that I could of course imagine how it could be. But I think in its current state it would be more valuable to have recordings or a few lines that it says and not necessarily have the response be AI generated. Because that makes it a little difficult to use. So with having all the lag and it not hearing me properly, the main value that it had was just the fact that it asked those questions. And not per se that it responded.

Alright. Thank you for having this interview with me and for the whole thing. I'll stop the recording now.

No problem. Good luck.

Thank you!

XCV

Thematic analysis

How was the product experienced?

Themes	Code	Participant	Subtheme
Uneasy			
	It takes some getting used to and it is a bit robot-like in the language interaction	P1	Rigid
	The content did feel a bit forced	P1	Rigid
	I stepped back and then it just said again "take a step back". So in the end I was up against the wall	P2	Rigid
	Deary couldn't hear me well. I needed to reiterate everything a few times.	P1	Couldn't hear
	Sometimes I leaned a bit in because it could not understand me. It was hard to know when to talk.	P1	Couldn't hear
	I did have difficulty with having a conversation.	P2	Couldn't hear
	I had difficulties with being understood.	P2	Couldn't hear

	Deary had difficulties understanding me.	P2	Couldn't hear
	when I did the exercise on the second day it couldn't hear me	P2	Couldn't hear
	Thinking about different combinations to say yes, and then it would say: "say yes or no".	P2	Couldn't hear
	It was a bit difficult to use, especially when I couldn't see the LEDs in the lights	P2	Hard to use
	Often times it wouldn't listen and it would remain quiet for three minutes and then talk again. That was a little difficult to keep the conversation going	P2	Hard to use
	I had to reset a few times	P2	Hard to use
	But I think in its current state it would be more valuable to have recordings or a few lines that it says and not necessarily have the response be AI generated. Because that makes it a little difficult to use.	P2	Hard to use
	with having all the lag and it not hearing me properly, the main value that it had was just the fact that it asked those questions. And not per se that it responded.	P2	Hard to use
Content			

xcvi

	the content was surprisingly good. I am deeply interested.	P1	Good
	The content of the conversation was pleasant but not thoroughgoing.	P2	Good
	Not particularly pleasant, I found it a little boring.	P2	Unsurprising
	I would say a few things and then it would say: "so you're gonna work, right?" and I was like "no."	P2	Wrong
Novelty			
	it was mostly valuable as something new and fun, something exciting.	P1	Conversation value
	I liked it, it was new for me	P1	Conversation value

	It is interesting on a purely linguistical level. I wouldn't buy it for its function	P1	Conversation value
	I also was curious, for example during the first conversation: what will be the next question?	P1	Explore
	the first interaction [was most exciting]. I was a bit hesitant to say hello because I didn't know what to expect. I had that with all settings	P1	Explore
	I didn't know what was going to happen [when Deary mistakenly said 'okay, I can't do anything for you anymore'], so I just thought: "okay, well nevermind then".	P2	Explore
Valuable			
	I don't know whether it is because of Deary, but my day was valuable.	P1	No influence
	it is a little difficult to judge whether the exercise was good for me or not	P2	No influence
	It actually helps a bit to do such a meditative exercise to make your thoughts relative. It helps with unwinding.	P1	Function helps
	[The conversation was] Pretty pleasant. It made me dwell on my day for a while.	P2	Function helps
	But I think it is nice to take a moment to think about [thoughts]	P2	Function helps

xcvii

	have something that can help you get back into your thoughts and into the world again.	P2	Function helps
umanlike			
	It felt more like an actual conversation than with other conversational AI tools	P1	Good conversation
	[Siri] does not have the advantage of a conversation	P1	Good conversation
	[Practically, humanness in AI] makes it chiller to have a conversation. But philosophically, it's scarier	P1	Good conversation
	The third day it was less bad. The conversation went pretty smoothly	P2	Good conversation
pecific			
	Within its niche, [Deary] is better in terms of conversation [than Siri or Google Mini]	P1	Value through purpose
	So you kind of go into the conversation with a purpose, so you know what you are going to do, I think it is good for something like this	P2	Value through purpose
ransparency			
	I had to really experiment to see what it could do	P1	Transparency could be increased
	[having a preview] would make the system more trustworthy. Knowing what will happen would decrease the threshold for using a particular setting for the first time.	P1	Transparency could be increased
	[the user manual] told me how to start up the device. That is the main thing. For the rest not that much. Maybe that I took it out of the power also because I knew it had a microphone and a connection to the cloud. But [it had] not too much [influence on my user experience]. I think	P2	Transparency & function

	not knowing [the capabilities of Deary] actually makes it interesting and human-like. It surprises you with their reaction like Siri would not be able to.	P1	Untransparent = human
	The voice felt trustworthy, but I couldn't really see what was behind the voice, as if you were looking at a human	P1	Untransparent = human
	I couldn't keep all my deepest darkest secrets with it and feel really happy with it [because it did not always understand me correctly]. But on the other hand, it did make the idea that it didn't really matter what I was going to say a bit greater. In the end that's also good because it is about reflecting on yourself and not on about what the machine thinks.	P2	Trust through failure
Control			
	We both had partial control. I set the borders and within those borders we had an even amount of control. In the end, that would make me more in control in total.	P1	Control is nice
	I think it is a really interesting concept that you are physically able to change it with an easy, rudimentary switch thing. It gives you some sort of power over the computer, which might be really good because after all it is a computer and there are a lot of thoughts about "AI is going to take over the world" and stuff	P2	Control is nice
	Because I could decide [the personality] myself, it felt like I was in control. But it still was some leap afterwards: you don't know how the conversation was going to go. I did trust, however, that Deary would guide me well.	P1	Control is nice
Personal			

xcviii

	And it is quite intimate because it stays between the product and the user	P1	Unique experience
	. [It is good to separate Deary from the purpose of things like Siri] Because it creates a special moment	P2	Unique experience
	This feels more personal and versatile [than prerecorded stories]	personal	Unique experience
Look			
	[Deary] looks nice. I liked how it came in a little compact box with some texture and I was interested.	P2	Look --> usability
	it is nice that [Deary] had a smiley face on it. That already hints to that you have a friendly conversation with it.	P2	Look --> usability

What influence does personality aspect of the product have on user experience and ethical implications?

Theme	code	participant	Subtheme
disagreeable			
	I felt like I needed to initiate and guide the conversation [with the disagreeable setting]	P1	Less usable
	because Deary was disagreeable, I wanted to be disagreeable myself too and said no to the assignment. I expected that Deary would do it anyway, but he just said 'bye' and was gone (haha)	P1	Reflect
	I expected that [my favorite personality] would be the most negative setting, as I thought it would be fun	P1	Fun
	Funny to talk to this bitchboy, so quite pleasant [conversation].	P2	Fun
	Mainly on the antagonistic one, it really felt like there was a special or fun personality, which made it a lot more interesting and which set it apart from this talk to a machine.	P2	Fun
	It surprised me that it just said "okay" at that point [when I said I did not want to do the exercise]	P1	Novel
	I liked the third day, how it was a bit different from a google home or something. I think because of that personality	P2	Novel

xcix

	The jabbing [made the conversation interesting]. It was kind of making fun of you, instead of you just making fun, like “haha, dumb computer”.	P2	Novel
neutral			
	my favorite one was neutral. It was the nicest	P1	Usable
agreeable			
	Agreeable was a bit too patronizing	P1	Negative
Human-like			
	Deary is more human-like. Siri always just fulfills your request, which is inhuman	P1	Own initiative
	Social aspect gives humanness, which causes engagement	P1	Engagement
	Sometimes I needed to remind myself quickly that I was talking to an AI	P1	Engagement

	I also experienced the personality as if it were a person playing an archetype, like I knew the AI but not the way it acted.	P1	Actor
Control			
	Also linking [the simple interaction] to personality seems like a really good choice because you can change it according to your mood. The AI is not always able to see your mood or see into your thoughts. So then you have that control of: “I feel it this way, so I will change the personality to this”.	P2	Accurate

C

Does using Deary let users reimagine the human-AI relationship in the near future?

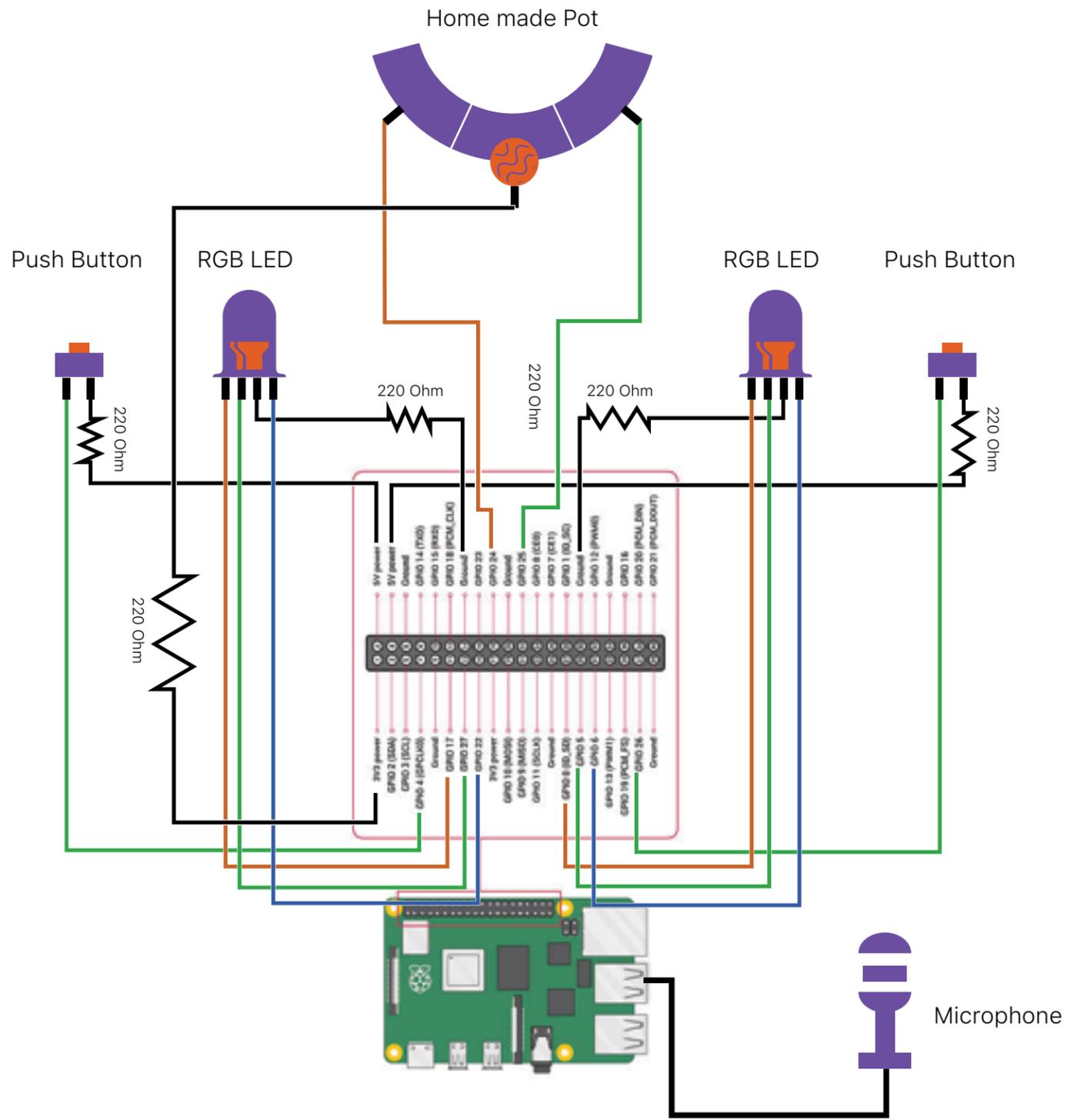
Themes	code	Participant	Subtheme
Bond			
	I think [if I used Deary for a longer time,] I would compare it to an adult version of a teddy bear. You form this emotional bond of which you feel that it is reciprocal, but deep down you know that it is not real	P1	Something personal
	If it learns over time, it would feel more like a friend	P1	Something personal
	what I would hope is to get an AI that is a bit more personal to you. Maybe it would have some random personality when you first get it, or it could grow with you. That would be nice, because then it also is something a bit more personal to you. Which I think would make it more fun and more close to you.	P2	Something personal
	Maybe the conversational AI can talk with you about news topics that are interesting to you. Also taking in news could become more like a personal reflection moment instead of just reading an article on your phone.	P2	Something personal
	Based on your previous answers, I think you would also like this product to have a bit more of a personal aspect rather than the AI tools that are existing now, right?; Yeah	P2	Something personal
Functional			
	[Whether it learns or stays 'distant'] would change the purpose. If it learns, it would be more like the teddy bear whereas if it stays distant, it would feel more like a tool	P1	Bond changes function

	I am curious what it would be like if Deary actually uses your input in further conversations. But for defusion, I think having it as a tool would be better.	P1	Keep it functional
Other use			
	I would use [Deary] more for the experience than the use. Its use could be a diary, meditation help or perhaps even a dream catcher!	P1	AI friend
	[A world where personal AI guides people would be] not that much different. I think people might have a short talk when they go to bed or when they wake up, something like that.	P2	AI friend
Realistic			
	It is connected to the internet, of course, as the computing is in the cloud. It is kind of this black box idea	P1	Trust issues
	I knew that it wouldn't remember or respond to anything I said to it in a surprising manner, which would actually be interesting	P1	Create learning
	it can't have any own initiative, as that is really hard to program. If you were to program freedom, you would need to program an infinite amount of rigid options.	P1	Limitations
	maybe that [the content felt a bit forced] will always be the case with these kinds of technologies	P1	Limitations

	technology is not really there yet. Because I have a google home but it just sits behind my couch and I never talk to it. Just because the experience is not great. So I think the most important thing is that it flows naturally, that you don't have to wait on the machine to get you and that you don't have to repeat yourself.	P2	Limitations
of social AI			
	[Talking to Deary] might be a bit lower threshold than talking to a real person. You know that it is just a machine and stuff, but it can still help you in a similar way. Maybe not replacing human contact but supplementing it.	P2	Supplement
	I think [therapy with a robot] as a supplement, it can be. Or as a first thing. But it shouldn't mean that human therapy would disappear. Or should disappear,	P2	Supplement
	Where is the divide between humans and AI? Should we break it? AI is useful, but shouldn't feel like a human conversation. That would not be true	P1	No need to go too real
of communicating			
	I think a physical thing would be best because you have something to focus your attention to, But it could also just be something else. Like an ominous voice to loom. Because		

	I think right now it is still nice to have a face to talk	P2	Other normal
	So I think that talking to a box still feels weird when I have a google home. But that might change. And similarly, we might not even need to see a face or anything that we're talking to. We might just talk anywhere and any direction. Yeah, weird.	P2	Other normal
Safe			
	I think it can be nice that it is not a real person because of yourself it then doesn't matter what you say.	P2	Distance to objects
Personality			
	I think it is very human to change and to grow during your life. So I think it would be only natural if the AI also changes.	P2	Subtle personality change
	Maybe [if Deary changes its personality automatically, it] would use a certain type of language or some words that it likes to use.	P2	Subtle personality change
	these language processing AI's go very generalized. An average human, let's say. I think it would be interesting if they go a bit more on their own routes or on their own way of speaking.	P2	Subtle personality change

L: Wiring + code final prototype



```

1  """
2  11-02-2022
3  Simon de Vries
4  Bachelor Industrial Design at Technical University Eindhoven
5
6  run Deary
7  for links and files that code was based on, check links.txt
8  """
9
10 #importing libraries for RGB, encoder and servo
11 import RPi.GPIO as GPIO
12 import sys
13 import time
14 import colorsys
15
16 #importing libraries to stream audio
17 import pyaudio
18 import wave
19 import sys
20 import os
21 import sounddevice as sd
22 import time
23
24 #importing libraries to get dialogflow working
25 from google.cloud import dialogflow_v2 as dialogflow
26 from google.api_core.exceptions import InvalidArgument
27 import json
28 from google.oauth2 import *
29
30 #setting up inputs for the encoder and button
31 button1 = 4;
32 button2 = 26;
33 buttonPushed = 0
34 agree = 24
35 disagree = 25
36 GPIO.setmode(GPIO.BCM)
37 GPIO.setwarnings(False)
38 GPIO.setup(button1,GPIO.IN, pull_up_down = GPIO.PUD_DOWN)
39 GPIO.setup(button2,GPIO.IN, pull_up_down = GPIO.PUD_DOWN)
40 GPIO.setup(agree,GPIO.IN, pull_up_down = GPIO.PUD_DOWN)
41 GPIO.setup(disagree,GPIO.IN, pull_up_down = GPIO.PUD_DOWN)
42
43 #parameters for streaming audio
44 CHUNK = 1024
45 FORMAT = pyaudio.paInt16
46 CHANNELS = 1
47 RATE = 44100
48 RECORD_SECONDS = 4
49 audio_output='/home/pi/FTP/Deary/tests/test.wav'
50 dialogflow_audio_output='/home/pi/FTP/Deary/tests/output.wav'
51
52 #setting up parameters to create a flow
53 buttonCount = 0
54 agent = 'neutral'
55
56 #Configuring RGB pins
57 pinRed1 = 17
58 pinGreen1 = 27
59 pinBlue1 = 22
60 pinRed2 = 0
61 pinGreen2 = 5
62 pinBlue2 = 6
63 GPIO.setup(pinRed1, GPIO.OUT)
64 GPIO.setup(pinGreen1, GPIO.OUT)
65 GPIO.setup(pinBlue1, GPIO.OUT)
66 GPIO.setup(pinRed2, GPIO.OUT)

```

```

67 GPIO.setup(pinGreen2, GPIO.OUT)
68 GPIO.setup(pinBlue2, GPIO.OUT)
69 RED1 = GPIO.PWM(pinRed1, 1000)
70 GREEN1 = GPIO.PWM(pinGreen1, 1000)
71 BLUE1 = GPIO.PWM(pinBlue1, 1000)
72 RED2 = GPIO.PWM(pinRed2, 1000)
73 GREEN2 = GPIO.PWM(pinGreen2, 1000)
74 BLUE2 = GPIO.PWM(pinBlue2, 1000)
75 RED1.start(0)
76 GREEN1.start(0)
77 BLUE1.start(0)
78 RED2.start(0)
79 GREEN2.start(0)
80 BLUE2.start(0)
81 colorVal = (122,122,122)
82
83 #defining functions
84 #function to make the light gently go on
85 def wake_up_light():
86     RED1.ChangeDutyCycle(int((colorVal[0]*100)/255 * 0.1))
87     GREEN1.ChangeDutyCycle(int((colorVal[1]*100)/255 * 0.1))
88     BLUE1.ChangeDutyCycle(int((colorVal[2]*100)/255 * 0.1))
89     RED2.ChangeDutyCycle(int((colorVal[0]*100)/255 * 0.1))
90     GREEN2.ChangeDutyCycle(int((colorVal[1]*100)/255 * 0.1))
91     BLUE2.ChangeDutyCycle(int((colorVal[2]*100)/255 * 0.1))
92     time.sleep(0.2)
93     RED1.ChangeDutyCycle(int((colorVal[0]*100)/255 * 0.3))
94     GREEN1.ChangeDutyCycle(int((colorVal[1]*100)/255 * 0.3))
95     BLUE1.ChangeDutyCycle(int((colorVal[2]*100)/255 * 0.3))
96     RED2.ChangeDutyCycle(int((colorVal[0]*100)/255 * 0.3))
97     GREEN2.ChangeDutyCycle(int((colorVal[1]*100)/255 * 0.3))
98     BLUE2.ChangeDutyCycle(int((colorVal[2]*100)/255 * 0.3))
99     time.sleep(0.2)
100    RED1.ChangeDutyCycle(int((colorVal[0]*100)/255 * 0.5))
101    GREEN1.ChangeDutyCycle(int((colorVal[1]*100)/255 * 0.5))
102    BLUE1.ChangeDutyCycle(int((colorVal[2]*100)/255 * 0.5))
103    RED2.ChangeDutyCycle(int((colorVal[0]*100)/255 * 0.5))
104    GREEN2.ChangeDutyCycle(int((colorVal[1]*100)/255 * 0.5))
105    BLUE2.ChangeDutyCycle(int((colorVal[2]*100)/255 * 0.5))
106    time.sleep(0.2)
107    RED1.ChangeDutyCycle(int((colorVal[0]*100)/255 * 0.7))
108    GREEN1.ChangeDutyCycle(int((colorVal[1]*100)/255 * 0.7))
109    BLUE1.ChangeDutyCycle(int((colorVal[2]*100)/255 * 0.7))
110    RED2.ChangeDutyCycle(int((colorVal[0]*100)/255 * 0.7))
111    GREEN2.ChangeDutyCycle(int((colorVal[1]*100)/255 * 0.7))
112    BLUE2.ChangeDutyCycle(int((colorVal[2]*100)/255 * 0.7))
113    time.sleep(0.2)
114    RED1.ChangeDutyCycle(int((colorVal[0]*100)/255))
115    GREEN1.ChangeDutyCycle(int((colorVal[1]*100)/255))
116    BLUE1.ChangeDutyCycle(int((colorVal[2]*100)/255))
117    RED2.ChangeDutyCycle(int((colorVal[0]*100)/255))
118    GREEN2.ChangeDutyCycle(int((colorVal[1]*100)/255))
119    BLUE2.ChangeDutyCycle(int((colorVal[2]*100)/255))
120
121 #function to make the light gently go off
122 def sleep_light():
123     RED1.ChangeDutyCycle(int((colorVal[0]*100)/255) * 0.9)
124     GREEN1.ChangeDutyCycle(int((colorVal[1]*100)/255) * 0.9)
125     BLUE1.ChangeDutyCycle(int((colorVal[2]*100)/255) * 0.9)
126     RED2.ChangeDutyCycle(int((colorVal[0]*100)/255) * 0.9)
127     GREEN2.ChangeDutyCycle(int((colorVal[1]*100)/255) * 0.9)
128     BLUE2.ChangeDutyCycle(int((colorVal[2]*100)/255) * 0.9)
129     time.sleep(0.2)
130     RED1.ChangeDutyCycle(int((colorVal[0]*100)/255 * 0.7))
131     GREEN1.ChangeDutyCycle(int((colorVal[1]*100)/255 * 0.7))
132     BLUE1.ChangeDutyCycle(int((colorVal[2]*100)/255 * 0.7))

```

civ

```

133 RED2.ChangeDutyCycle(int((colorVal[0]*100)/255 * 0.7))
134 GREEN2.ChangeDutyCycle(int((colorVal[1]*100)/255 * 0.7))
135 BLUE2.ChangeDutyCycle(int((colorVal[2]*100)/255 * 0.7))
136 time.sleep(0.2)
137 RED1.ChangeDutyCycle(int((colorVal[0]*100)/255 *0.5))
138 GREEN1.ChangeDutyCycle(int((colorVal[1]*100)/255 *0.5))
139 BLUE1.ChangeDutyCycle(int((colorVal[2]*100)/255 *0.5))
140 RED2.ChangeDutyCycle(int((colorVal[0]*100)/255 *0.5))
141 GREEN2.ChangeDutyCycle(int((colorVal[1]*100)/255 *0.5))
142 BLUE2.ChangeDutyCycle(int((colorVal[2]*100)/255 *0.5))
143 time.sleep(0.2)
144 RED1.ChangeDutyCycle(int((colorVal[0]*100)/255 *0.3))
145 GREEN1.ChangeDutyCycle(int((colorVal[1]*100)/255 *0.3))
146 BLUE1.ChangeDutyCycle(int((colorVal[2]*100)/255 *0.3))
147 RED2.ChangeDutyCycle(int((colorVal[0]*100)/255 *0.3))
148 GREEN2.ChangeDutyCycle(int((colorVal[1]*100)/255 *0.3))
149 BLUE2.ChangeDutyCycle(int((colorVal[2]*100)/255 *0.3))
150 time.sleep(0.2)
151 RED1.ChangeDutyCycle(int((colorVal[0]*100)/255) * 0)
152 GREEN1.ChangeDutyCycle(int((colorVal[1]*100)/255) * 0)
153 BLUE1.ChangeDutyCycle(int((colorVal[2]*100)/255) * 0)
154 RED2.ChangeDutyCycle(int((colorVal[0]*100)/255) * 0)
155 GREEN2.ChangeDutyCycle(int((colorVal[1]*100)/255) * 0)
156 BLUE2.ChangeDutyCycle(int((colorVal[2]*100)/255) * 0)
157
158 #function to get audio input
159 def write_from_mic():
160     time.sleep(1)
161     wake_up_light()
162     print("* listening to speech...")
163     p = pyaudio.PyAudio()
164     stream = p.open(
165         format=FORMAT,
166         channels=CHANNELS,
167         rate=RATE,
168         output=True,
169         input = True,
170         frames_per_buffer=CHUNK
171     )
172
173     frames = []
174     data = stream.read(CHUNK)
175     for i in range(0, int(RATE / CHUNK)*RECORD_SECONDS):
176         data = stream.read(CHUNK)
177         frames.append(data)
178
179     print("* done recording")
180
181     stream.stop_stream()
182     stream.close()
183     p.terminate()
184
185     wf = wave.open(audio_output, 'wb')
186     wf.setnchannels(CHANNELS)
187     wf.setsampwidth(p.get_sample_size(FORMAT))
188     wf.setframerate(RATE)
189     wf.writeframes(b''.join(frames))
190     wf.close()
191     sleep_light()
192
193 #function to play back audio
194 class AudioFile:
195     chunk = 1024
196
197     def __init__(self, file):
198         """ Init audio stream """
199
200         self.wf = wave.open(file, 'rb')
201         self.p = pyaudio.PyAudio()
202         self.stream = self.p.open(
203             format = self.p.get_format_from_width(self.wf.getsampwidth()),
204             channels = self.wf.getnchannels(),
205             rate = self.wf.getframerate(),
206             output = True
207         )
208
209     def play(self):
210         wake_up_light()
211
212         """ Play entire file """
213         data = self.wf.readframes(self.chunk)
214         while data != '':
215             self.stream.write(data)
216             data = self.wf.readframes(self.chunk)
217             if data == b'':
218                 sleep_light()
219                 break
220
221     def close(self):
222         """ Graceful shutdown """
223         self.stream.close()
224         self.p.terminate()
225
226     def playResponse(intent):
227         a = AudioFile(dialogflow_audio_output)
228         a.play()
229         a.close()
230         if intent != 'Einde Fallback Intent' and intent != 'Einde Doeit' and intent !=
231             'Stoppen' and intent != 'DefusieUitleg Fallback Intent - no':
232             record_detect_play(DIALOGFLOW_PROJECT_ID, session_id, audio_output,
233                 DIALOGFLOW_LANGUAGE_CODE)
234         else:
235             buttonCount = 0
236             sys.stdout.flush()
237             os.execl(sys.executable, 'python', __file__, *sys.argv[1:])
238
239 #function for detecting audio
240 def record_detect_play(project_id, session_id, audio_file_path, language_code):
241     """Returns the result of detect intent with streaming audio as input.
242     Using the same `session_id` between requests allows continuation
243     of the conversation."""
244
245     write_from_mic()
246     from google.cloud import dialogflow
247
248     session_client = dialogflow.SessionsClient()
249
250     # Note: hard coding audio_encoding and sample_rate_hertz for simplicity.
251     audio_encoding = dialogflow.AudioEncoding.AUDIO_ENCODING_LINEAR_16
252     sample_rate_hertz = 44100
253
254     session = session_client.session_path(project_id, session_id)
255     print("Session path: {}".format(session))
256
257     with open(audio_file_path, "rb") as audio_file:
258         input_audio = audio_file.read()
259
260     audio_config = dialogflow.InputAudioConfig(
261         audio_encoding=audio_encoding,
262         language_code=language_code,
263         sample_rate_hertz=sample_rate_hertz,

```

CV

```

263     )
264     query_input = dialogflow.QueryInput(audio_config=audio_config)
265
266     request = dialogflow.DetectIntentRequest(
267         session=session, query_input=query_input, input_audio=input_audio,
268     )
269
270     # Note: The result from the last response is the final transcript along
271     # with the detected content.
272     #query_result = response.query_result
273     texttospeech_response(project_id, session_id, request, language_code)
274
275     #function for playing back audio
276     def texttospeech_response(
277         project_id, session_id, request, language_code
278     ):
279         """Returns the result of detect intent with texts as inputs and includes
280         the response in an audio format.
281
282         Using the same `session_id` between requests allows continuation
283         of the conversation."""
284         response = session_client.detect_intent(request=request)
285
286         print("=" * 20)
287         print("Query text: {}".format(response.query_result.query_text))
288         print(
289             "Detected intent: {} (confidence: {})\n".format(
290                 response.query_result.intent.display_name,
291                 response.query_result.intent_detection_confidence,
292             )
293         )
294         print("Fulfillment text: {}\n".format(response.query_result.fulfillment_text))
295         # The response's audio_content is binary.
296         with open(dialogflow.audio_output, "wb") as out:
297             out.write(response.output_audio)
298             print('Audio content written to file "output.wav"')
299         try:
300             playResponse(response.query_result.intent.display_name)
301         except:
302             record_detect_play(DIALOGFLOW_PROJECT_ID, session_id, audio_output,
303                               DIALOGFLOW_LANGUAGE_CODE)
304
305     #function to convert hsv to rgb
306     def hsv2rgb(h,s,v):
307         return tuple(round(i * 255) for i in colorsys.hsv_to_rgb(h,s,v))
308
309     #the LOOP
310     #making it so deary can be pushed once to be turned on and another time to have the
311     #agent selected
312     while buttonCount < 2:
313         if(buttonCount==1):
314
315             #Defining colors and Deary settings
316             if GPIO.input(agree) == GPIO.HIGH:
317                 colorVal = (0,50,0)
318                 agent = 'agree'
319             elif GPIO.input(disagree) == GPIO.HIGH:
320                 colorVal = (50,0,0)
321                 agent = 'disagree'
322             else:
323                 colorVal = (0,0,50)
324                 agent = 'neutral'
325
326             if(round(time.time() * 1000)%500 == 0):
327                 RED1.ChangeDutyCycle(int(colorVal[0]*100)/255)
328                 GREEN1.ChangeDutyCycle(int(colorVal[1]*100)/255)

```

```

327         BLUE1.ChangeDutyCycle(int(colorVal[2]*100)/255)
328         RED2.ChangeDutyCycle(int(colorVal[0]*100)/255)
329         GREEN2.ChangeDutyCycle(int(colorVal[1]*100)/255)
330         BLUE2.ChangeDutyCycle(int(colorVal[2]*100)/255)
331
332     #check button is pressed
333     if buttonPushed == 0:
334         if GPIO.input(button1) == GPIO.HIGH or GPIO.input(button2) == GPIO.HIGH:
335             buttonPushed = buttonPushed+1
336             time.sleep(0.5) #add a delay as a way to debounce
337             buttonCount = buttonCount+1
338             print("button is pressed!")
339         elif buttonPushed != 0:
340             buttonPushed = 0
341
342     #running Deary
343     if buttonCount >= 2:
344         sleep_light()
345         #defining which agent gets accessed
346         if agent == 'agree':
347             creds_file = '/home/pi/FTP/Deary/tests/pkAgree.json'
348             DIALOGFLOW_PROJECT_ID = 'deary-agree-qgsq'
349         elif agent == 'neutral':
350             creds_file = '/home/pi/FTP/Deary/tests/pkNeutral.json'
351             DIALOGFLOW_PROJECT_ID = 'deary-neutral-f9pp'
352         elif agent == 'disagree':
353             creds_file = '/home/pi/FTP/Deary/tests/pkDis.json'
354             DIALOGFLOW_PROJECT_ID = 'deary-disagree-agfg'
355
356     #setting up Dialogflow session
357     os.environ["GOOGLE_APPLICATION_CREDENTIALS"] = creds_file
358     DIALOGFLOW_LANGUAGE_CODE = 'nl'
359     session_client = dialogflow.SessionsClient()
360     session_id = 'anything';
361
362     #running the intent flow
363     try:
364         #this function loops over and over again
365         record_detect_play(DIALOGFLOW_PROJECT_ID, session_id, audio_output,
366                           DIALOGFLOW_LANGUAGE_CODE)
367     except:
368         record_detect_play(DIALOGFLOW_PROJECT_ID, session_id, audio_output,
369                           DIALOGFLOW_LANGUAGE_CODE)

```

cvi

M: Files final user test

Cultural Probe Diary

ACT vierdaagse

Uitleg

Je hebt dit boekje omdat je mee doet aan de 'cultural probe' voor Simon's eindproject. Ik vraag je om komende vier dagen mijn product, Deary, te gebruiken. Per dag is er een pagina met uitleg en met kleine opdrachten. De laatste opdracht van elke dag vraagt je om een tekening of foto te maken. Veel plezier, succes en wees creatief!

Dag 1

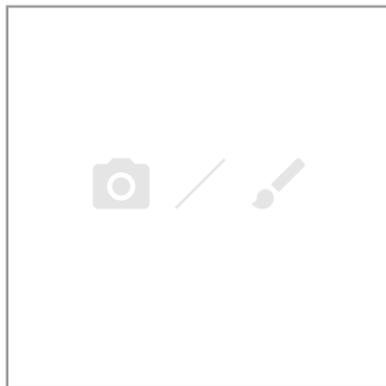
Zet Deary op vriendelijk (de meest rechter stand).

Hoe aangenaam
vond je het
gesprek?

Wordt je dag
waardevol?
waarom?

Wat
symboliseert
het best je dag?

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____



Dag 2

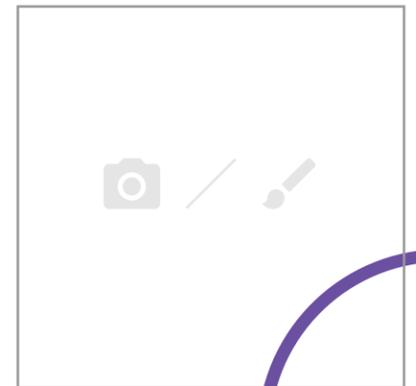
Zet Deary op neutraal (de middelste stand).

Hoe aangenaam
vond je het
gesprek?

Wordt je dag
waardevol?
waarom?

Wat
symboliseert
het best je dag?

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____



Dag 3

Zet Deary op antagonistisch (de meest linker stand).

Hoe aangenaam vond je het gesprek?	Wordt je dag waardevol? waarom?	Wat symboliseert het best je dag?
--	---------------------------------------	---

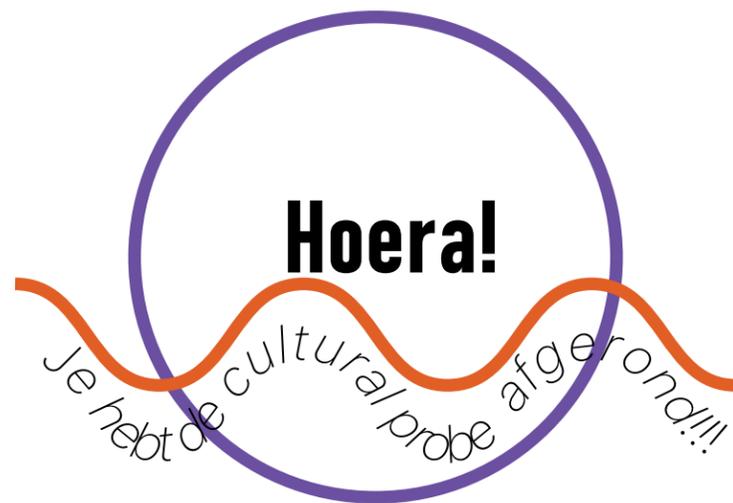
_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	

Dag 4

Kies zelf een stand om Deary op in te stellen.

Hoe aangenaam vond je het gesprek?	Wordt je dag waardevol? waarom?	Wat symboliseert het best je dag?
--	---------------------------------------	---

_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	



Laat het weten aan Simon. Hij komt binnenkort langs om de spullen op te halen en voor een klein interview.

Interview cultural probe

- Research questions: Does using Deary let users reimagine the human-AI relationship in the near future?
- Setting: at participant's home. 1 interviewer, 1 interviewee
- Duration: 30 min
- Protocol: unstructured; as a discussion; voice and notes taken
- Method: RQ is answered based on:
 - Duration and engagement of the discussion
 - Answers to the questions, after thematic analysis

Questions

- What did you think of using Deary?
- What was your favorite personality setting?
- What was your reaction to being able to change how Deary acts?

- Did you have experience with using conversational AI tools before using Deary?
- For what purpose did you use those?
- What was your standpoint about conversational AI products at that point?
- What would you say is the difference between Deary and the conversational AI tools you used before?

- Who was in control of the interaction: you or Deary?
- How well did Deary fulfill its purpose?
- How personal did the interaction with Deary feel?
- What would let you use a product such as Deary?

- Do you think AI will be used for more personal purposes, like therapy, in the future?
- What do you think of this? Is this preferable?
- What would such a world look like?
- How do you think AI will influence the world in the near future?

How your data is used

Why this text is here

The product and the development team of Deary follow the European Commission's guidelines for ethical AI. This page aims to give you transparency on the use of your data and how the AI in Deary works. Aside from sticking to regulations, we also provide you with this information to improve your user experience. After all, trusting a product increases your enjoyment.

How Deary gathers your data

Deary only registers your voice inputs and the use of the physical sensors. It records your voice and interprets it to match a voice output (intent). The latest voice input is stored exclusively on the physical device. The use of physical sensors is not stored and is only used to control Deary at the moment of interaction.

The device does store your voice inputs online, even when a conversation is not totally completed. This data is stored alongside the time and date of the input and Deary's response.

The process of interpreting voice input is called Natural Language Processing (NLP).

Why Deary exists

Deary is a near-future, probable critical design. It is a product that can be developed within mere years. It aims to offer a user experience that differs from the functional use that AI currently (2022) is generally used for. By using AI for a very personal purpose and with the option to customize, it aims to make the user think about our near-future relationship with AI, as AI gets more incorporated in our society.

How Deary uses your data

The only AI aspect of Deary is NLP and intent matching, i.e. interpreting your voice inputs and matching it to an output. Or put simply: having a conversation.

The conversations with Deary will not change over time. Deary does not 'get to know' you. However, you will see that Deary can understand some words and will use those words to create unique sentences.

The data stored online is stored on the personal Google account of the researcher. The data thereby is exclusively available to the researcher, the researcher's university coach and Google. The online data is not used automatically for any purpose.

1.  Plug in power and audio
2.  Push to wake Deary up
3.  Slide to select agreeableness
4.  Push again to confirm
5.  Say something like "ho!" Start the conversation (in Dutch)

How to use

This is the back side.
Please flip me over.



Deary talks you through Acceptance and Commitment Therapy (ACT). This is a form of cognitive behavioral therapy that encourages people to embrace thoughts and feelings rather than fighting them or feeling guilty for them. One part of ACT is cognitive defusion. Cognitive defusion involves creating space between yourself and your thoughts and feelings so that they have less of a hold over you. In this way it helps to cope with uncomfortable or unhelpful thoughts. Deary conversationally leads you through one defusion exercise, in which you are asked to find an unhelpful thought and to step away from it, literally creating distance.

What it does



User Manual

N: Written interview AI student

Vragenlijst over eindproject Simon

Vragen zijn voor ...

Introductie

Hoi! fijn dat je deze vragenlijst wil invullen. Ik ben bezig met een project wat gerelateerd is aan AI, maar heb eigenlijk nog helemaal geen expert daarover gesproken. Vandaag speel jij de expert, aangezien je een master doet die over AI gaat.

-ik zit nog in mn bachelor haha, wel van plan om t dit jaar af te ronden.

Ik laat eerst even weten wat mijn project is, en dan vraag ik je om een aantal best wel open vragen te beantwoorden. Doe dit zo vrijuit als je wil, en wees ook zeker niet bang om kritiek te leveren. Dat is juist waarom ik je vraag dit te doen!

Wat is het project?

Mijn project gaat breed gezien over *Aesthetics of AI*. Oftewel: hoe kunnen we met een toepassing van AI iets moois toevoegen aan de wereld. Daarnaast gaat het ook over *Ethics of AI*, waar jij waarschijnlijk ook een hoop over weet.

Mijn eigen onderzoeksvraag is: *'How should we interact with conversational agents as they shift towards real social actors?'* Het gaat dan vooral om de esthetische waarde. Om die vraag te beantwoorden maak ik een product, genaamd *Deary*, waarmee je kan praten. Het product zal je helpen reflecteren op stressfactoren om je heen waardoor je meer veerkracht krijgt, wat goed is voor je mentale gezondheid. Dit is dan een minder taakgebonden conversational AI dan, bijvoorbeeld, Siri of Google assistant.

Allemaal leuk en aardig, maar hoe beantwoordt dat dan mijn vraag? Nou, je kan *Deary's* persoonlijkheid instellen. Op een schaal van agreeable - disagreeable om precies te zijn. Je kan hen dus erg meegaand maken, een beetje neutraal of juist compleet op zichzelf gericht en niet behulpzaam. Ik laat twee mensen die baat kunnen hebben bij mijn product een prototype in huis nemen voor een week, zodat ik kan zien hoe zij omgaan met het product en hoe hun relatie met het product veranderen door de tijd heen. Vrij vaag dus, en eerder anecdotisch bewijs dan een duidelijk antwoord op mijn onderzoeksvraag. Maar goed, daar is mijn project een *critical design* voor en is mijn studie een knutselstudie voor.

Klik op deze link om een video over het concept te zien (raad ik aan om even te doen): <https://vimeo.com/639481000>

Vragen

1. Wat is je eerste impressie van mijn project?

Enigszins irrealistisch voorlopig. Het lastige van AI is dat het in sommige dingen veel beter is dan mensen en in sommige dingen ver achterloopt. Meer technische problemen die je van meerdere kanten kan bekijken zullen ze sneller oplossen tot een niveau wat wij niet eens begrijpen, zie het alphaGo project (niet belangrijk). **Het begrijpen van de intrinsieke betekenissen van wat iemand zegt en de achterliggende emoties is iets wat voorlopig puur menselijk is.**

Desalniettemin is het natuurlijk wel heel interessant om over na te denken.

2. Wat vind je sterk aan mijn project / projectrichting?

De ethische vragen die ermee komen. Iets wat eigenlijk nog te weinig wordt behandeld in de AI wereld. Al hoewel het buitengewoon interessant is om over na te denken (vind ik), wordt er eigenlijk nog te weinig mee gedaan. Het bedrijfsleven is natuurlijk meer op zoek naar winst dan ethische kwesties behandelen, wat soms jammer is. AI zijn er ook argumenten om te zeggen dan ethische producent meer winstgevend zijn.

3. Wat vind je zwak aan mijn project/projectrichting?

Ik gok dat het bij de studie hoort, maar het is natuurlijk een uiterst theoretisch onderzoek. Voorlopig zijn we nog niet dichtbij het analyseren van gesprekken en emoties op een menselijk niveau en ik denk dat dat nog even gaat duren. Dit maakt het natuurlijk lastig om concrete en goede antwoorden te geven, maar we kunnen het altijd proberen.

4. Hoe relevant is het om nu de manier waarop we omgaan met AI-enabled producten, en hoe dat in de toekomst kan, aan de kaak te stellen?

Zeer relevant. Mensen hebben de capaciteit om zeer veel te geven om de dingen die ze hebben. **Als mensen dus meer geven om dingen kunnen ze dus ook een grote invloed op ze hebben en daarmee stelt jouw project een goede vraag.** Willen we wel dat AI's, die geprogrammeerd om winstgevend te zijn, ons persoonlijk bestaan beïnvloeden? Is het ethisch om een robot je gevoelens en persoonlijkheid te laten testen?

5. Denk jij dat mensen emotionele banden met producten kunnen vormen als ze met ons kunnen praten en geïntegreerd zijn in ons leven?

Zeer zeker. Voorbeelden zoals het **tamagotchi effect** of een meer academisch voorbeeld van Sharkey in 2008 die japanse kinderen liet spelen met een simpele robot, waaraan ze al snel gehecht werden. De vraag die daarmee komt is, wil je dat wel? **Als je met een AI kan praten over je problemen dan hoef je jezelf niet meer vulnerable te stellen aan andere mensen, waardoor je de band tussen mensen zeer waarschijnlijk verslechterd.**

6. Wat vind jij ervan dat conversational producten nu een vaste persoonlijkheid hebben, die vaak vriendelijk is?

Ik denk dat dat **voorlopig de slimme keuze** is. Het gaat namelijk vooral nog om probleem service chatbots of gewoon een grappige robot om mee te kletsen. Om zoiets confronterend te maken is zeer risicovol, want als het dan tot slechte gevolgen leidt, dan is de vraag wie er verantwoordelijk is. Een voorbeeld kan zijn met jouw project, er is een huwelijk wat niet zo goed gaat tussen een man en een vrouw. Nou de vrouw koopt jou praatrobot, want ze is bang

vervolgens vraagt de robot of ze blij is met haar man. Dan kan het lijken alsof de robot haar misschien erin heeft gepraat om vervolgens te scheiden met alle (geld) gevolgen vandien. Dan is de vraag of dat de juiste keuze was, want met wat meer geduld was de man wel veranderd. En als je dan dat krijgt, moet je de vraag stellen **wie er nu eigenlijk verantwoording voor die robot moet afleggen**. Mag een bedrijf een product maken dat evt een huwelijk kapot maakt? Had de vrouw toch gewoon moeten weten dat dit een gevolg kon zijn en stemde ze daarmee in toen ze het kocht?

Een robot die sociale implicaties kan hebben is buitengewoon gevaarlijk in allerlei situaties, want in een lastige situatie is er geen goed advies.

7. Wat vind jij ervan dat de meeste huidige conversational AI producten vaakgericht in plaats van sociaal zijn?

Factisch. Hoe meer mensen gehecht kunnen raken aan AI producten, hoe minder menselijke interacties worden gestimuleerd. Is het niet fijner om te praten met iemand/iets die het lekker met je eens is? Dat kan jouw AI als je het bvb op niet confronterend zet.

3. Ken jij bronnen waarvan je denkt dat ik ze zou kunnen gebruiken voor mijn project / interessant zou vinden?

Zeker.

Robots, Ethics, and Intimacy: The Need for Scientific Research. : een literatuur onderzoek over robots en mensen. Niet alles is relevant voor jou maar zitten zeker goede dingen in. Ik zal ook een pdf sturen die de paper samenvat, zodat je niet alles hoeft te lezen.

De lecture en paper horen samen bij dezelfde week. Week 6 is dat, dus kijk daar maar na in de pdf.

Als je wil, kan ik evt ook mijn radboud account delen, **want daar is een lecture die gedeeltelijk over jouw vraag gaat, wordt ook gegeven door een geweldige professor.**

Als er nog iets niet duidelijk is, kan je dat altijd nog vragen!

9. BONUSVRAAG! Denk jij dat er ooit non-specific/strong/full AI zal zijn? Ik denk van wel. Het idee dat een mens bestaat uit zijn brein geeft mij het idee dat we dat kunnen namaken. Alhoewel ik denk dat het waarschijnlijk na onze dood pas zal gebeuren.

10. Ga je nog iets leuks doen vandaag? (om even uit de vragenlijst te komen, meer voor jezelf)

Ik ga terug (zit zelfs nu in de trein) naar breda om te repeteren met mn orkest en na afloop een paar

CXIII

0: Personal Development Plan

Personal Development Plan

Simon de Vries

1317237

For my Final Bachelor Project of Industrial Design at the Technical University of Eindhoven

September 24th 2021



Vision

Every designer should be aware of the behaviour changing capability of design, and strive for a better world. I dream of a world where **design mediates sociality**. Through techno-social phenomena such as the Walkman effect (Hosokawa, 1984), our society has shifted from being focused on community to networked individualism (Wellman, 2001). Communication is made easy, yet staying in your comfortable social bubble is as well.

In this situation, I believe design can create a lot of value in **bringing people together** and **diversifying** our frame of reference. I often look to festivals, like Lowlands (Mojo Concerts BV, n.d.) as inspiration. Here, a lot of people with diverse backgrounds come together to celebrate the one thing they love: music, unified by the graphic design of Hansje van Halem (Van Halem, 2021). Another powerful example of social design is the Teeter Totter Wall (Brewer, 2021), that brought people on both sides of the US-Mexican border together.

Left: Lowland's visual identity (Mojo Concerts BV, n.d.) Right: the Teeter Totter Wall (Brewer, 2021)



References

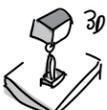
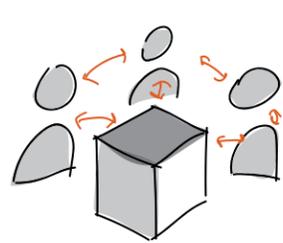
- Hosokawa, S. (1984). The walkman effect. *Popular music*, 4, 165-180.
- Wellman, B. (2001, October). Little boxes, globalization, and networked individualism. In *Kyoto workshop on digital cities* (pp. 10-28). Springer, Berlin, Heidelberg.
- Mojo Concerts BV. (n.d.). Home. Lowlands 2021 | A Campingflight to Lowlands Paradise. Retrieved 1 September 2021, from <https://lowlands.nl/>
- Van Halem, H. (2021). Lowlands 2021 - www.hansje.net. HansjeNet. <https://www.hansje.net/lowlands-2021/>
- Brewer, J. (2021, January 19). Pink seesaws across the US-Mexico border win Design of the Year 2020, on Trump's last day. <https://www.itnicethat.com/news/teeter-totter-wall-saw-travel-collective-chapele-design-of-the-year-winner-architecture-19072>

nd

Professional Identity

As can be derived from my vision, I am a **social designer**. I fare best within **group projects**, where I often take on a **leading role**. I like to **keep the overview** and to plan in projects. Next to that, I am always keen on learning new skills and **experimenting** with things – such as materials – unfamiliar to me.

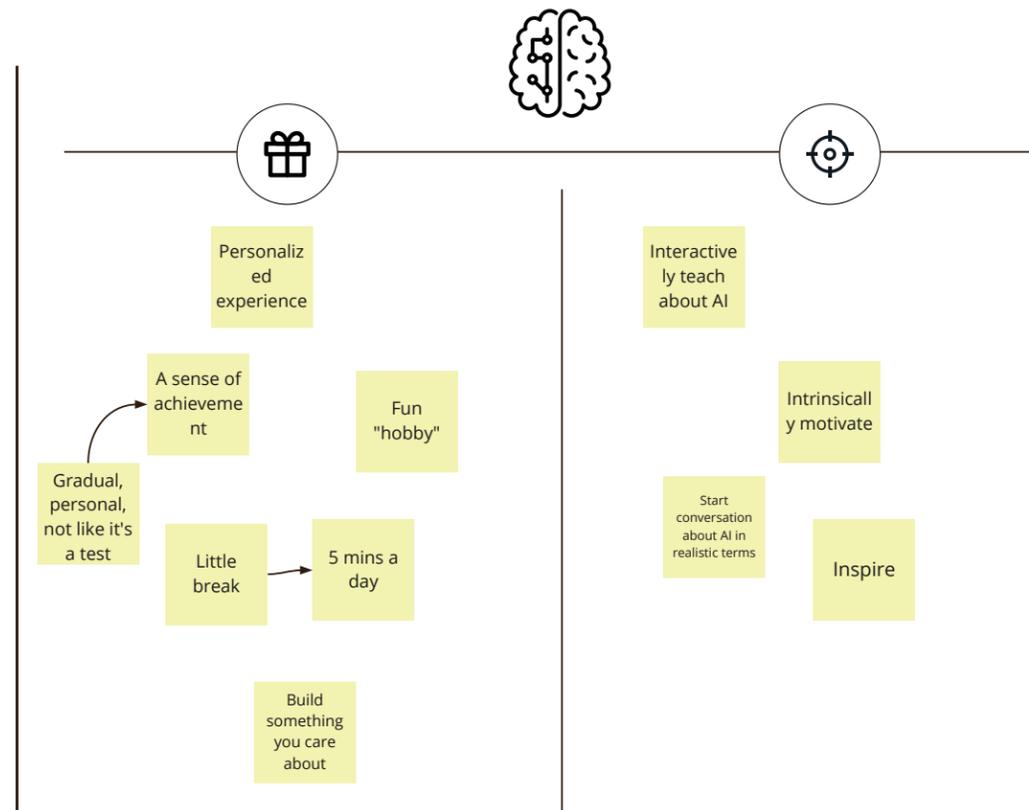
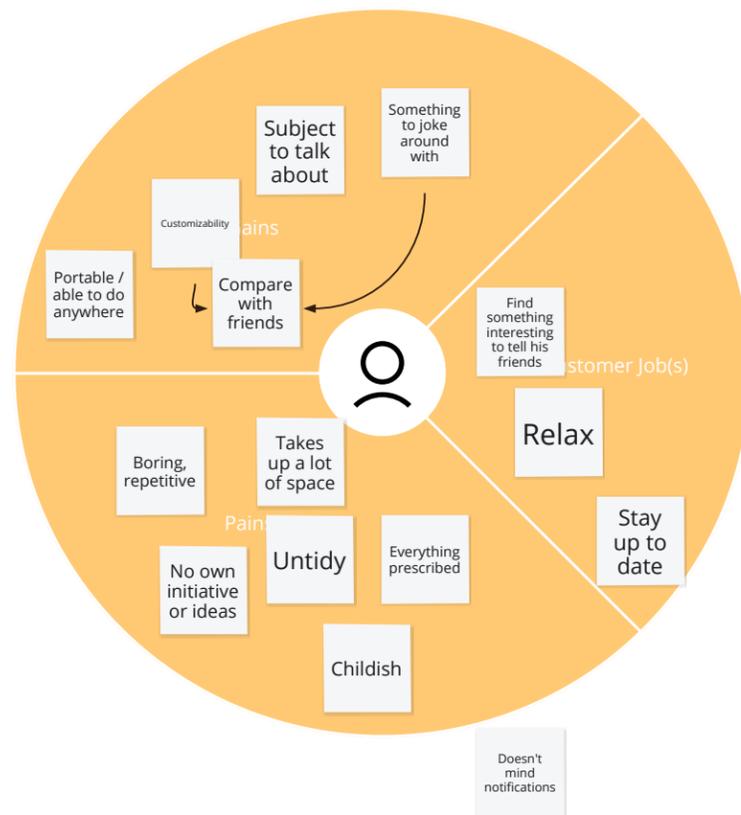
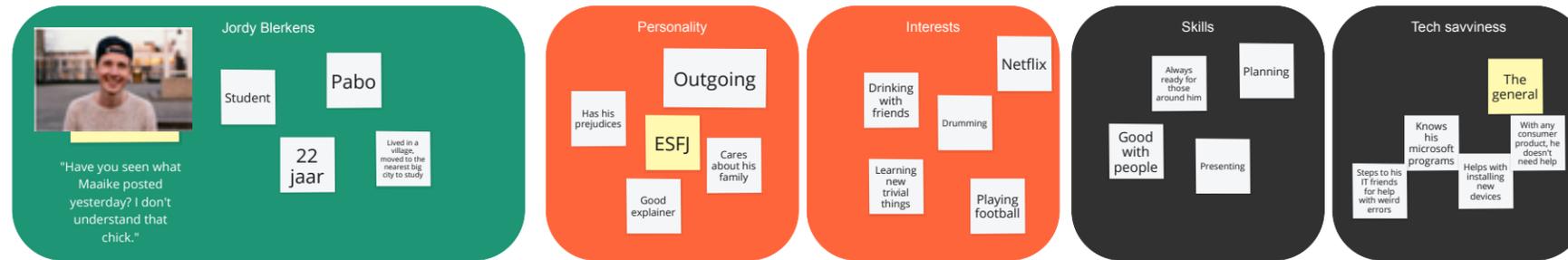
Where I shine in communication, graphic design and user research, I am not as good with calculations, 3D modeling and electronics. These last parts are things I want to work on during my last semester at the bachelor of Industrial Design in Eindhoven. In that way I wish to **become an all-rounder**.



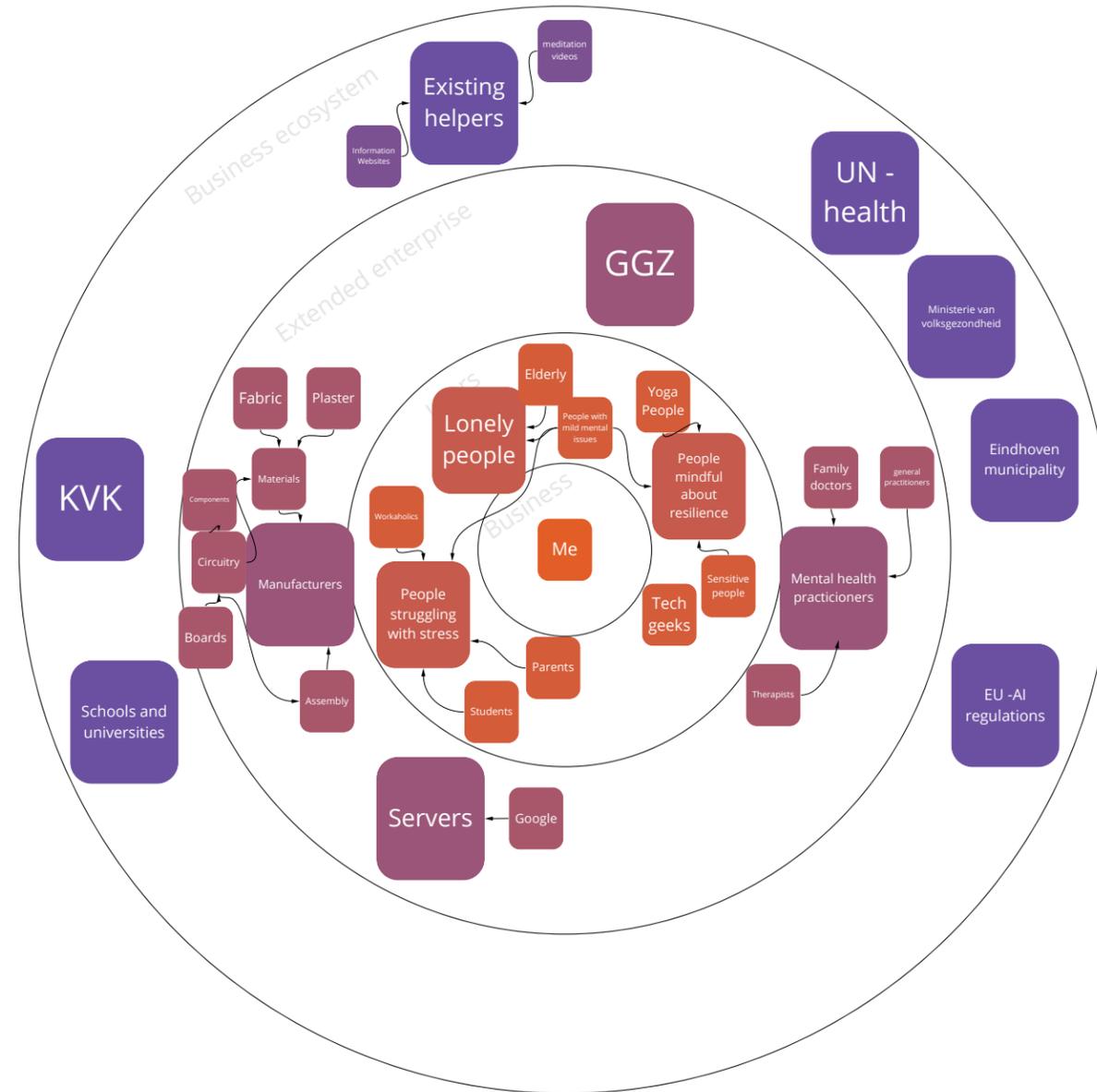
CXV

Planned Development

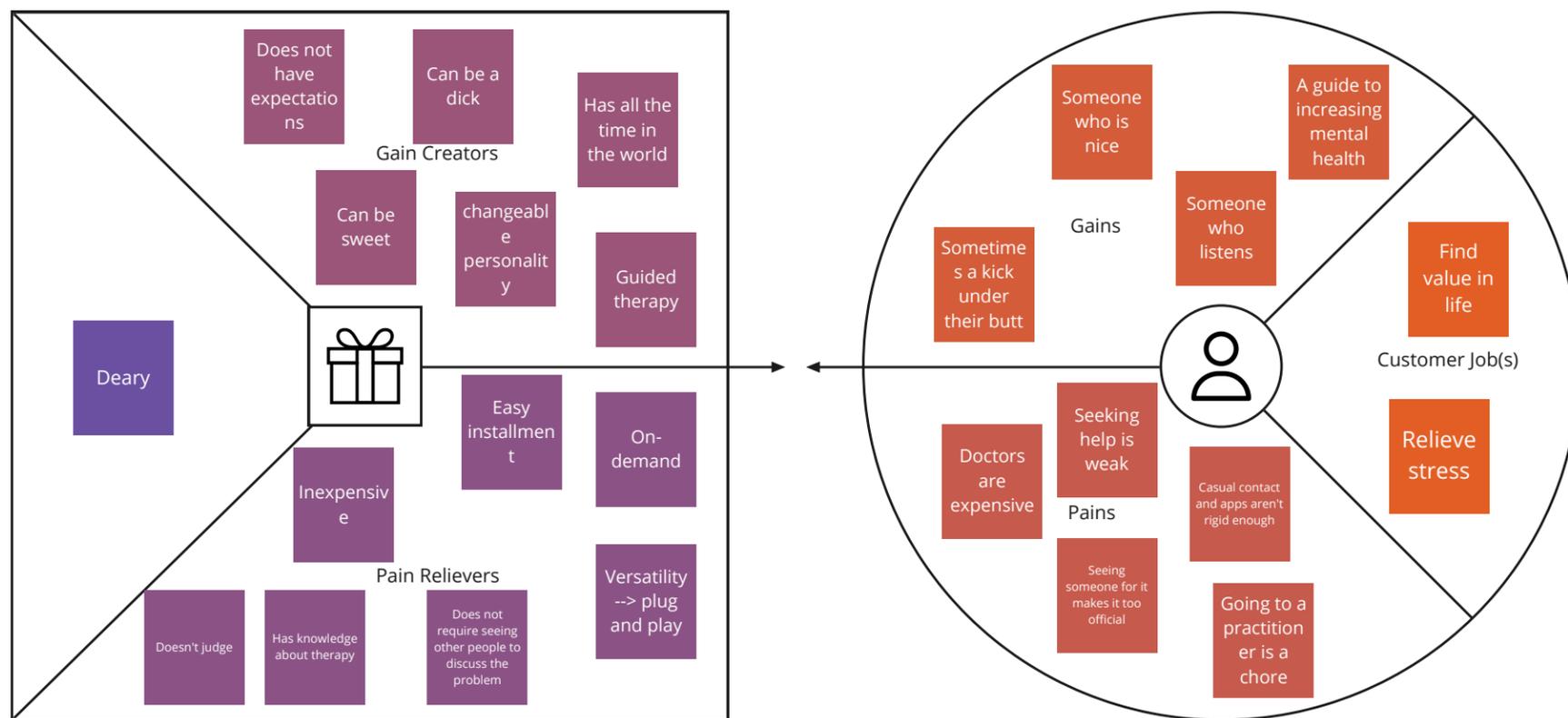
P: Value proposition canvas phase 1



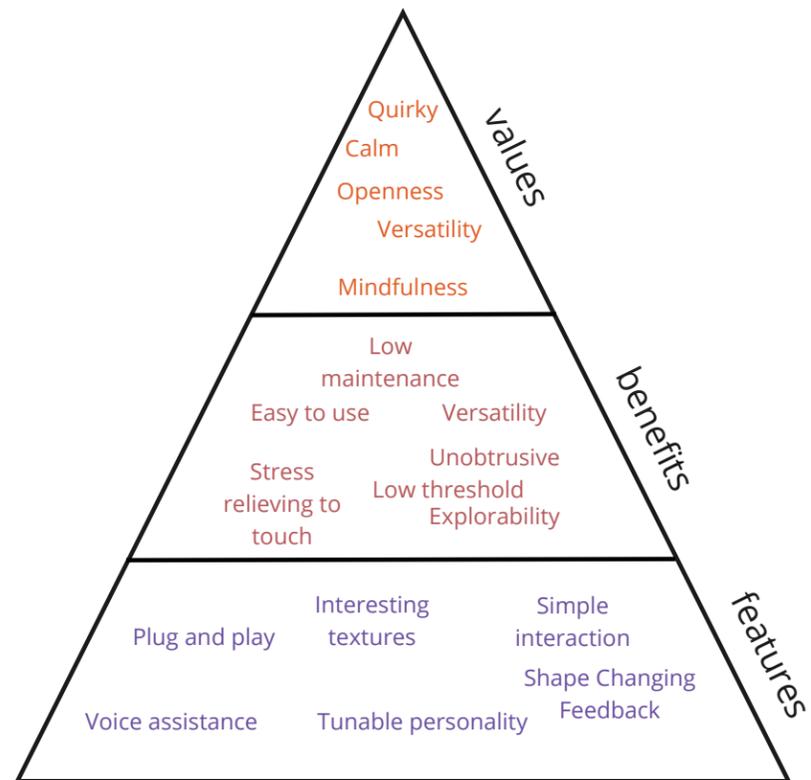
Q: Final business canvases



Phase of journey	Problem discovery	Solution finding	Finding Deary	Buying	Installation	First use	Use continuation	System failure	End of use
Actions What does the customer do?	Reflect Talk to friends Talk to general practitioners	Read information online Talk to friends Taking time off	Looking it up Getting it recommended	Buying online Buying in a store	Setting it up in the home	Speaking	Getting used to using Deary. Speaking	Breaking the product / product stops working.	Throwing it away
Touchpoint What part of the service do they interact with?	None / Word of Mouth marketing	None	Website, Information sources	Commercial availability	Physical device	Use of the product	Use of the product.	None	None
Customer Thought What is the customer thinking?	I feel so down all the time :(It is nice to hear that others feel the same. I wonder what might help.	Hmm, what a vague concept. It seems helpful and fun tho!	I think it will help me. It's worth a shot at least!	It's quite large, but at least it's plug and play! Let's find a nice place to put this thing.	I am so FUCKING done with work. HOLY SHIT. I need someone to talk to fast	Deary really does help with my mental state! I love that I can tune the personality	Oh No! Did I break it? Deary...? Are you there? Why isn't he responding??	I'm sad Deary died. But they really helped. I had a good time with them. Now it's time to move on.
Customer Feeling What is the customer feeling?									
Process ownership Who is in the lead on this?			 		 	 	 		
Opportunities	Offering a great and low-threshold experience	Social media advertisements. Low threshold and cool.	Making it easy to try out / get a glimpse. Distribution in stores (like kruidvat) to increase exposure.	Adding another value for the buyer (sane mind, sane planet?). Make the product unobtrusive to the user and the planet if not used.	Add a setup guide. (Make it really easy, on the box?) Make it look neater while keeping the plug-and-playability and feeling of fragility.	Make Deary recognize emotions. Having and implementing expert opinions.	Let Deary change its own emotion without user input. Remember and build on things said by the user. More variety in agreeableness.	Adding a small guide (online) of what to do when the system fails.	Making the product recycleable / cradle to cradle -> the user might be able to make something out of the product when it stops working. (Candle holder?) Maybe making it appealing to give it to friends!! It will end helping someone at some point, while it might help others



CXXI



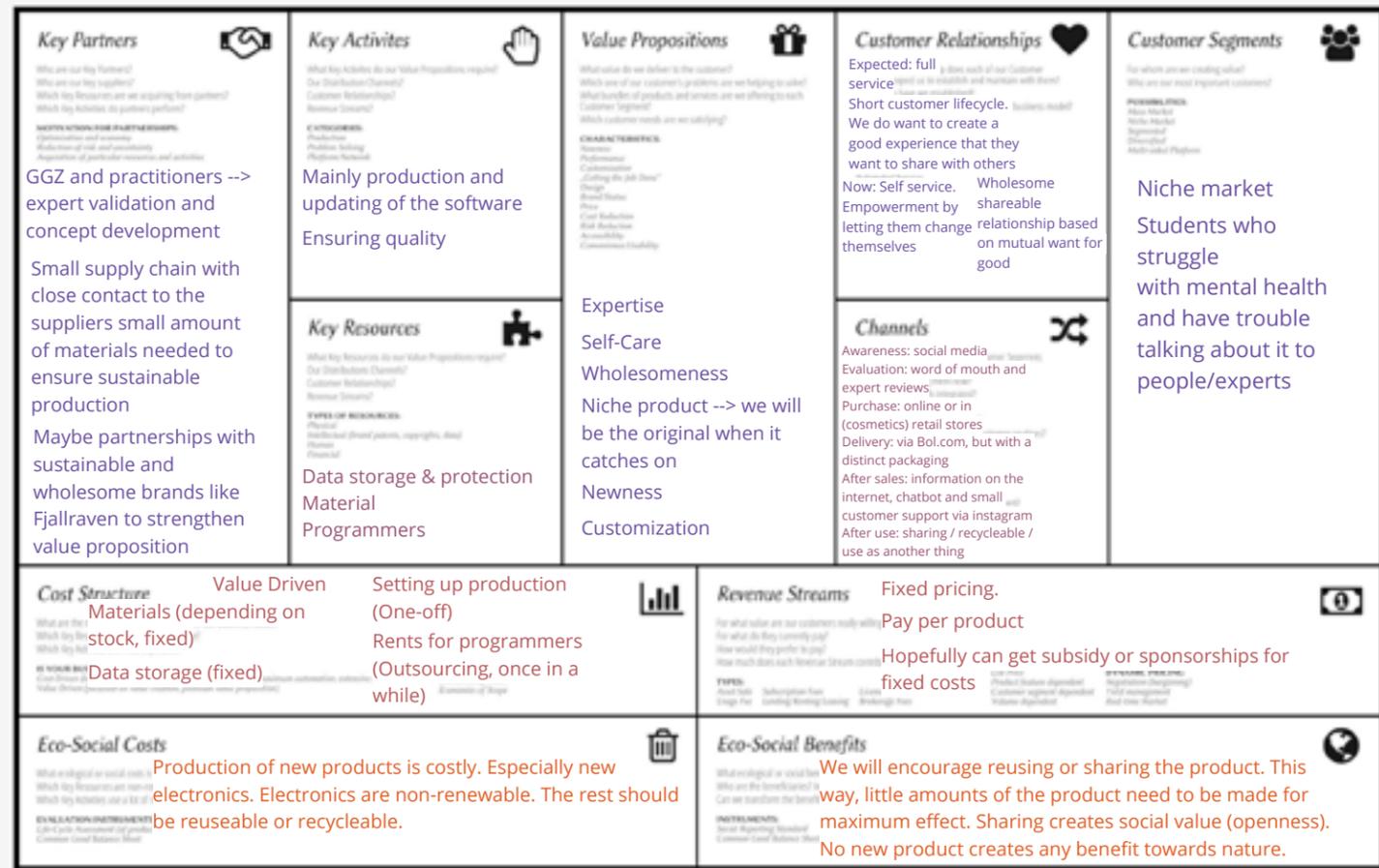
cxxii

The Sustainable Business Model Canvas

Designed for:

Designed by:

Date: _____
Version: _____



Based on: www.businessmodelgeneration.com

www.businessmodelgeneration.com

R: Boost-AI certificates

The files are modified for legal reasons





AI Trainer certification:
Prediction & analysis

Simon Reinout Quintijn de Vries

Valid from:
10/7/21 - 10/7/22

The recipient of this certificate has completed an AI Trainer e-learning course from boost.ai. They have aced tests and practical assignments on how to use the boost.ai solution to train a world-class virtual agent powered by conversational AI.



Lars Ingegnier
CEO and founder
boost.ai



CXXV

AI Trainer certification:
Interaction design

Simon Reinout Quintijn de Vries

Valid from:
10/14/21 - 10/14/22

The recipient of this certificate has completed an AI Trainer e-learning course from boost.ai. They have aced tests and practical assignments on how to use the boost.ai solution to train a world-class virtual agent powered by conversational AI.



Lars Pieter Reinds
CEO and founder
boost.ai



S: ERB form

Ethical Review Form Education (Version 17.07.2020)

This Ethical Review Form should be completed for every research study that involves human participants or personally identifiable data. The form should be submitted and approved by your supervisor before potential participants are approached to take part in the research study.

Part 1: General Study Information

1	Student name and email	Simon de Vries; s.r.g.d.vries@student.tue.nl
2	Supervisor name and email	Dr. Yaliang Chuang; y.chuang@tue.nl
3	Degree Program	Industrial Design
4	Bachelor/master	Bachelor
5	Bachelor/master end project?	Yes, it is a Bachelor End Project
6	Course name and code	DFP008 (Artifice Squad) DPB390 (Final Bachelor Project)
7	Project title	Deary: Critical Design on AI as Social Actors
8	Research location	Eindhoven
9	Research period (start/end date)	Monday 06-09-2021 until Friday 28-01-2022
10	[If Applicable] Proposal already approved by (external) Ethical Review Board: Add name, date of approval, and contact details of the ERB	
11	Research question	I am designing a product called <i>Deary</i> . It is a conversational diary that builds there users' resilience, enabling to better handle life events, in that way preventing mental disorders. It can be talked to and responds in ways that makes people reflect on their stress factors. Besides its main functionality, the agreeableness of the conversational agent can be tuned, which can stimulate reflection on how conversational agents should be designed, including who should decide how they act. Based on the deployment of this tool, I ask the following questions: 1. How does the agreeableness setting of a therapeutic voice assistant influence the user experience? 2. Does the personalizability of a voice assistant provide new perspectives on the current proceedings of AI-enabled technology?
12	Description of the research method	My process can be split up in three iterations. Iteration one – Design Exploration – September, October:

1

Ethical Review Form

		<ul style="list-style-type: none"> - At the beginning of the project, I did a user test in 3 sessions. One session with 1 person, one session with 2 people and one session with 3 people. The early version of the product was aimed at helping people create a good sleeping rhythm. Via a projected animation and voice interaction, I let participants experience in five minutes how two days and two nights of interacting with the product in your house would be like. This experience was then rated with product reaction cards (Benedik & Miner, 2002), a Geneva emotion wheel (Sacharin et al., 2002) and a UX curve (Kujala et al., 2011). - With the same iteration, I did an expert interview. The expert was a doctor specialized in sleep-related complaints. I showed the same projection and voice and then asked about the user experience, conditions for good sleep and relevance of the product. <p>Iteration two – Expert Consultation - November:</p> <ul style="list-style-type: none"> - In iteration two, I changed the interaction and purpose of the product. The purpose now was to talk to, to decrease stress and increase mindfulness. I did a participatory design session (Elizavora & Dowd, 2017) with four participants. In the participatory design session I explained the purpose of the product, asked participants to collaboratively order 11 wooden shapes on a scale from agreeable – disagreeable, do the same for twelve materials, afterwards discuss how my product should behave, individually create lo-fi prototypes for the look and feel of my product and then in rounds collaboratively create lo-fi prototypes for the agreeableness-changing interaction, including a scenario. This last activity was done in a similar fashion to 6-3-5 brainwriting (Weissenberger et al., n.d.). - With the same iteration, I did another expert interview. This time, the interviewees were two psychiatrists. I asked questions to find out how resilience is increased therapeutically and which conversation technique would best suit my device. <p>Iteration three – Final Design Evaluation - December: For my final user research, I will deploy a cultural probe with two participants. The probe exists of a prototype of my product and a booklet with questions the participants can answer every day. These questions will provoke reflection on the use of my product, <i>Deary</i>. They will give me insight in how they interacted with the device in terms of what settings they chose and what their feelings were about it.</p> <p>Cultural probes are packages consisting of daily tasks that rely on participants' self-documentation. They are useful in situations where an observer's presence can distract from the everyday behavior of participants. They provide insight into human behaviour and design opportunities (Celikoglu et al., 2017).</p>
13	Description of the research population, in- and exclusion criteria	<p>The selection criteria for participants are:</p> <ul style="list-style-type: none"> - Location: they should live in Stratum. This is rather ambiguous, but decreases the variability of life experience of participants while avoiding bias through certain expertise. The participants were found through the spread of posters through the neighbourhood and on social media. - Age: the participants should be between 18 and 25 years old. Research by the RIVM concluded that performance pressure among Dutch young adults and students is rising (Schoemaker et al., 2019). Another study concluded that due to the COVID-19 pandemic, Dutch students have been feeling more somber and lonely, which could be combatted by increasing their resilience (Woudenberg et al., 2020).

2

Ethical Review Form

		<p>- Resilience: participants should have a relatively low-to-moderate level of resilience. That way, they are people that can benefit from the use of my product. Additionally, then it can be measured what influence my product has on their resilience. Their resilience has been tested for selection with a validated questionnaire based on Portzky's RS-NL questionnaire (for example of its use, see Turan (2013)).</p> <p>The participants of the participatory design workshop of iteration two were asked to fill in this questionnaire after the workshop. The two selected participants will be contacted via Whatsapp to ask if they want to be included in the final study.</p>
14	Number of participants	<p>Cultural probe study: 2 people Psychiatrist interview: 2 people Participatory Design Session: 4 people Sleep expert interview: 1 person Early user tests: 6 people</p> <p>People who performed the early user tests, participatory design session and cultural probe study were part of the same selection of participants. The total number of distinct participants is: 7 possible users + 3 experts = 10 participants</p>
15	Explain why the research is socially important.	<p>As explained at the exclusion criteria, it is beneficial to increase the resilience of people aged 18-25. <i>Deary</i> can help with this by providing conversations based on the principles of Acceptance and Commitment Therapy (ACT) (Hayes et al., 2004). ACT is shown to increase resilience for people of all ages and for different conditions. For example, for injured US Navy soldiers (Udell et al., 2018) and chronic illnesses in children (Ernst & Mellon, 2016). <i>Deary</i> focuses specifically on stress, as Schoemaker et al. (2019) concluded that stress is rising in Dutch adolescents, and that that is a threat to their mental wellbeing. Lastly, Crane et al. (2019) concluded that self-reflection, a part of ACT, on stressors can increase resilience.</p> <p>Thus, providing ACT to people aged 18-20 is a good cause. Next to that, performing this study also fills multiple gaps in current academic research around AI-enabled products. On the one hand, social robots, such as a voice assistant like <i>Deary</i> can be described, have been shown to positively impact therapy (not ACT specifically) in Broekens et al. (2009). And there is interest in fully autonomous social robots to be used in therapy (Winkle, 2007 and Esteban et al., 2018). On the other hand, personalization of voice assistants has been shown to increase the user experience of using a voice assistant (Völkel et al., 2020).</p> <p>However, an overlap of personalization and social robotics is missing in current research. At the same time, research in both fields is not extensive. Even at the same time, Trust in AI is crucial for a good user experience (Toreini et al., 2020). Lovejoy (2018) advocated that trust in AI can be created by ensuring human control and by making it transparent how the AI works. My hypothesis is thus that making the user control the personality of a voice assistant creates a good user experience.</p> <p>To conclude, increasing resilience in adolescents is very helpful and can be done with <i>Deary</i> by creating conversations based on ACT. Performing the research with <i>Deary</i> fills a gap in current academics by combining the fields of social robotics, personalization in voice assistants and trust in AI. This is done by creating and researching a therapeutic voice-enabled AI tool whose agreeableness characteristic can be tuned by a user.</p>

Ethical Review Form

16	Describe the way participants will be recruited	<p>I recruited my participants via the use of a poster describing my initial design research direction. I spread this poster through my neighbourhood and on social media. I also approached some friends to ask if they wanted to participate, with an explanation of the current status of my project and my goals.</p> <p>Contact with the participants is done via email and Whatsapp.</p>
17	Provide a brief statement of the risks you expect for the participants or others involved in the research and explain. Take into consideration any personal data you may gather and privacy issues.	<p>The data I will collect are the responses of the participants to my diary study. The data gathered in the diary study will describe the personality setting on the device, what the participants talked about with the device, what affection they have towards the device and how they evaluated the interaction.</p> <p>All entries in the diary study are voluntary and there is no requirement for how personal the responses need to be. If personal data comes out, it is because the participants themselves chose to give it. The participants will be aware that Simon de Vries and Yaliang Chuang can read their responses.</p> <p>All data will be anonymized before analysis, processing and documentation or any other form of sharing to another person than Simon de Vries or Yaliang Chuang.</p> <p>All data collected through the diary study as well as the previous studies in this project are stored digitally on Simon de Vries's computer and physically at Simon de Vries's house. Furthermore, responses to the recruitment questionnaire and the resilience questionnaire are stored in the Google Drive of Simon de Vries.</p>
18	References	<p>Benedek, J., & Miner, T. (2002). Product reaction cards. <i>Microsoft</i>, July, 29.</p> <p>Broekens, J., Heerink, M., & Rosendal, H. (2009). Assistive social robots in elderly care: a review. <i>Gerontechnology</i>, 8(2), 94-103.</p> <p>Celikoglu, O. M., Ogut, S. T., & Krippendorff, K. (2017). How do user stories inspire design? A study of cultural probes. <i>Design Issues</i>, 33(2), 84-98.</p> <p>Crane, M. F., Searle, B. J., Kangas, M., & Nwiran, Y. (2019). How resilience is strengthened by exposure to stressors: The systematic self-reflection model of resilience strengthening. <i>Anxiety, Stress, & Coping</i>, 32(1), 1-17.</p> <p>Elizavora, O., & Dowd, K. (2017, December 14). Participatory Design in Practice. <i>UX Magazine</i>. Retrieved 26 November 2021, from https://uxmag.com/articles/participatory-design-in-practice</p> <p>Ernst, M. M., & Mellon, M. W. (2016). Acceptance and commitment therapy (ACT) to foster resilience in pediatric chronic illness. In <i>Child and adolescent resilience within medical contexts</i> (pp. 193-207). Springer, Cham.</p> <p>G. Esteban, P., Hernández García, D., Lee, H. R., Chevalier, P., Baxter, P., & Bethel, C. (2018, March). Social Robots in Therapy: Focusing on Autonomy and Ethical Challenges. In <i>Companion of the 2018 ACM/IEEE International Conference on Human-Robot Interaction</i> (pp. 391-392).</p> <p>Hayes, S. C., Strosahl, K. D., Bunting, K., Twohig, M., & Wilson, K. G. (2004). What is acceptance and commitment therapy?. In <i>A practical guide to acceptance and commitment therapy</i> (pp. 3-29). Springer, Boston, MA.</p> <p>Kujala, S., Roto, V., Väänänen-Vainio-Mattila, K., Karapanos, E., & Sinnelä, A. (2011). UX Curve: A method for evaluating long-term user experience. <i>Interacting with computers</i>, 23(5), 473-483.</p> <p>Lovejoy, J. (2018, January). The UX of AI. In <i>Google Design</i>.</p>

Ethical Review Form

	<p>Sacharin, V., Schlegel, K., & Scherer, K. R. (2012). Geneva emotion wheel rating study.</p> <p>Schoemaker, C., Kleinjan, M., Van der Borg, W., Busch, M., Muntinga, M., Nuijen, J., & Dedding, C. (2019). Mentale gezondheid van jongeren: enkele cijfers en ervaringen.</p> <p>Toreini, E., Aitken, M., Coopamootoo, K., Elliott, K., Zelaya, C. G., & Van Moorsel, A. (2020, January). The relationship between trust in AI and trustworthy machine learning technologies. In <i>Proceedings of the 2020 conference on fairness, accountability, and transparency</i> (pp. 272-283).</p> <p>Turan, S. (2013). <i>Onderzoek naar de psychometrische eigenschappen van de Resilience Scale-Nederlandse Versie bij mensen met een lage sociaaleconomische status en verschillende etnische achtergronden</i> (Bachelor's thesis, University of Twente).</p> <p>Udell, C. J., Ruddy, J. L., & Procento, P. M. (2018). Effectiveness of acceptance and commitment therapy in increasing resilience and reducing attrition of injured US Navy recruits. <i>Military medicine</i>, 183(9-10), e603-e611.</p> <p>Völkel, S. T., Kempf, P., & Hussmann, H. (2020, July). Personalised Chats with Voice Assistants: The User Perspective. In <i>Proceedings of the 2nd Conference on Conversational User Interfaces</i> (pp. 1-4).</p> <p>Weissenberger, C., Nutsi, A., Friedrich, P., Lubkowitz, M. (n.d.). 6-3-5 Method. Retrieved 26 November 2021, from https://www.designthinking-methods.com/en/3ldeenfindung/6-3-5.html</p> <p>Winkle, K. (2017, November). Social robots for motivation and engagement in therapy. In <i>Proceedings of the 19th ACM International Conference on Multimodal Interaction</i> (pp. 614-617).</p> <p>Woudenberg, S., van der Scheun, M., Ihle, A., StudentWeetRaad, C., & van der Steen, I. (2020). Wat zijn de factoren die bijdragen aan de mentale gezondheid van studenten in de leeftijd van 17-25 jaar?.</p>
--	---

Part 2: Checklist for Minimal Risk

	Yes	No
<p>Does the study have a medical scientific research intention or claim (see definition below)</p> <p><i>Medical/scientific research is research which is carried out with the aim of finding answers to a question in the field of illness and health (etiology, pathogenesis, signs/symptoms, diagnosis, prevention, outcome or treatment of illness), by systematically collecting and analysing data. The research is carried out with the intention of contributing to medical knowledge which can also be applied to populations outside of the direct research population.'</i></p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	If yes or maybe: Your supervisor should submit the study to the ERB. You cannot get automatic ethical approval	If no: Continue with question 2
<p>Does the study involve human material (such as body waste material derived from non-commercial organizations such as hospitals)?</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	If yes or maybe: This is only allowed if your supervisor has consulted with the medical coordinator. Continue with question 3	If no: Continue with question 2
<p>Do all participants give their explicit consent – voluntary basis – either digitally or on paper? Have they given consent in the past for the use of education or for re-use in line with the current research question?</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	If yes: Continue with question 4	If no: Your supervisor should submit the study to the ERB. You cannot get automatic ethical approval
<p>Does the study involve discussion or collection of personal data? (e.g. name, address, phone number, email address, IP address, BSN number, location data) or will the study collect and store names, pictures, or other identifiable data of individual subjects?</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	If yes: The handling, storing and de-identification of the personal data should be discussed with your supervisor. Continue with question 5 if you met all requirements for handling personal data (see question 1)	If no: Continue with question 2

Ethical Review Form

	Yes	No
the study involve participants who are particularly vulnerable or unable to give informed consent? (e.g. children, people with learning disabilities, patients, people receiving counselling, people living in care or nursing homes, people recruited through self-help groups)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	If yes: Your supervisor should submit the study to the ERB. You cannot get automatic ethical approval	If no: Continue with que
the research procedure cause harm or discomfort to the participant in any way? (e.g. causing pain or more than mild discomfort, stress, anxiety)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	If yes: Your supervisor should submit the study to the ERB. You cannot get automatic ethical approval	If no: Continue with que
the participants receive any compensation for participation? Such as a coupon or a chance to win a prize?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	If yes: Your supervisor should submit the study to the ERB. You cannot get automatic ethical approval	If no: Continue with que or 10, depending on type of study (see text below)
Following questions 8-9 are for observational research (e.g. (semi-)structured interviews; focus groups; (participatory) observations). If your research is experimental, then skip questions 8-9 and continue with question 10		
it be necessary for participants to take part in the study without their knowledge and consent at any time? (e.g. covert observation of people)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	If yes: This is only allowed when observing behavior in public space. If so, continue with question 9. If you observe people in non-public space without their consent, your supervisor should submit the study to the ERB. You cannot get automatic ethical approval	If no: Continue with que
participants be asked to discuss or report on their personal experiences, religion, alcohol or drug use, political thoughts, or other topics that are highly sensitive or intimate?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	If yes: Your supervisor should	If no: Continue with part

The following questions 10-13 are for experimental research (e.g. measurements on yourself or another person; testing a prototype/device; influencing behavior through manipulation (e.g. light or temperature). If your research is observational, then skip questions 10-13 and continue with part 3			
		Yes	No
10	Is the study invasive (i.e. it affects the body such as puncturing the skin; taking blood or other body material (such as DNA) from the participant)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		If yes: Your supervisor should submit the study to the ERB. You cannot get automatic ethical approval	If no: Continue with question 11
11	Does the device have a medical purpose such as diagnosis, prevention, monitoring, prediction, prognosis, treatment or alleviation of disease or injury?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		If yes or maybe: Your supervisor should submit the study to the ERB. You cannot get automatic ethical approval	If no: Continue with question 12
12	Will the experiment involve the use of physical devices that are 'CE' certified for unintended use (meaning you will use existing CE certified devices for other things than they were originally intended for)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		If yes: This is only allowed if they are completely harmless. They should have a harmless voltage of <5V and hazardous waste (fumes/gas/substances) should not be released. You should discuss with your supervisor whether you need to have the device tested for safety	If no: Continue with question 13
13	Will the experiment involve the use of physical devices that are not 'CE' certified?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		If yes: This is only allowed if they are completely harmless. They should have a harmless voltage of <5V and hazardous waste (fumes/gas/substances) should not be released. You should discuss with your supervisor whether you need to have the device tested for safety	If no: Continue with part 3

Part 3: Enclosures and Signature

<p>es (tick if applicable):</p> <p>ed consent form (link to template);</p> <p>urvey the participants need to</p> <p>, or a description of other</p> <p>ments (such as interview</p> <p>s or a description of the prototype);</p> <p>ised to find participants (such as</p> <p>s, flyers, etc);</p> <p>val other research ethics</p> <p>re;</p>	<p>The informed consent form for the cultural probe study and cultural probe diary are attached as an appendix.</p> <p>Text for poster to find participants: <i>"Help een student met zijn eindproject!"</i></p> <p><i>Hoi, ik ben Simon en ik doe nu mijn bachelor eindproject van Industrial Design op de TU. Mijn project gaat over kunstmatige intelligentie. In dat thema wil ik iets ontwerpen wat op een mooie en leuke manier aan gebruikers overbrengt wat AI nou eigenlijk is en kan. Er is nou eenmaal veel verwarring, speculatie en doemdenken om het thema heen.</i></p> <p><i>In mijn project wil ik graag mensen uit de buurt betrekken: echte betekenisvolle innovatie begint lokaal. Je zou me dus enorm helpen door een paar vraagjes te beantwoorden via de QR code hier beneden!</i></p> <p>Scan de QR code voor de vragenlijst" QR code linked to: https://docs.google.com/forms/d/e/1FAIpQLSd2EaYEn_ILN8ebHA2Qlv9a2Th5yN6l8H6TWexrQ9pg/viewform?usp=</p>
<p>declare that I have completed this form fully</p> <p>Signature(s) of the student(s)</p>	

form with your supervisor. If any of the boxes you ticked in Part 2 suggest that your supervisor should refer your study to the ERB for ethical approval, try to change your research design in such a way that you can get an approve it instead. If this is not possible, ask your supervisor to submit the proposal to the ERB. It will take 4 to five weeks before you receive a decision from the ERB.

Part 4: Review by supervisor



<p>Does your data storage adhere to all requirements of responsible data management (see table below for more details to be added)?</p>	<p>If yes: Continue with question 2</p>	<p>If no: Discuss with your student the next steps to adhere to the requirements</p>
<p>Does your research proposal adhere to all requirements for automatic approval?</p>	<p><input checked="" type="checkbox"/></p>	<p><input type="checkbox"/></p>
	<p>If yes: Please skip the questions 3-6 and sign the form</p>	<p>If no: Discuss with your student if any alterations can be made in order to adhere to the requirements for automatic approval. If you decide that the student cannot adhere to the requirements you as a supervisor need to submit the proposal to the ERB. Please answer the following additional questions (3-6)</p>

Additional questions for ERB approval

<p>Describe on the topics from part 2 that do not qualify for automatic approval. Describe how you will address any potential risk for the research project for each topic.</p>	
<p>Describe and justify the number of participants you need for this research, taking into account risks and benefits</p>	
<p>Describe if your data are completely anonymous, or if they will be de-identified (pseudonymized or anonymized) and if so, how</p>	
<p>Do you have access to the data?</p>	

Part 5: Signature by supervisor

<p>declare that I have completed this form</p>	
--	--

Ethical Review Form

--	--	--

Ethical Review Form

Appendix A: Subject consent form

Toestemmingsformulier proefpersoon

Cultural probe studie Deary

- Ik heb informatie gekregen en ik begrijp waar dit onderzoek over gaat. Ook kon ik vragen stellen. Mijn vragen zijn voldoende beantwoord. Ik had genoeg tijd om te beslissen of ik meedoe.
- Ik weet dat meedoen vrijwillig is. Ook weet ik dat ik op ieder moment kan beslissen om toch niet mee te doen of te stoppen met het onderzoek. Daarvoor hoef ik geen reden te geven.
- Ik weet dat sommige mensen mijn gegevens kunnen inzien. Die mensen zijn Simon de Vries en Yaliang Chuang.
- Ik geef toestemming voor het verzamelen en gebruiken van mijn gegevens voor wetenschappelijke publicaties en meer of ander onderzoek op mijn gegevens.
- Ik geef toestemming om mijn gegevens op de onderzoekslocatie nog 15 jaar na dit onderzoek te bewaren.

Ik wil meedoen aan dit onderzoek.

Naam proefpersoon:

Handtekening:

Datum : __ / __ / __

Ik verklaar dat ik deze proefpersoon volledig heb geïnformeerd over het genoemde onderzoek.

Als er tijdens het onderzoek informatie bekend wordt die de toestemming van de proefpersoon zou kunnen beïnvloeden, dan breng ik hem/haar daarvan tijdig op de hoogte.

Naam onderzoeker (of diens vertegenwoordiger):

Handtekening:

Datum: __ / __ / __

De proefpersoon krijgt een kopie van het getekende toestemmingsformulier.

Cultural Probe Diary

ACT vierdaagse

Uitleg

Je hebt dit boekje omdat je mee doet aan de 'cultural probe' studie voor Simon's eindproject. Ik vraag je om komende vier dagen mijn product, Deary, te gebruiken. Deze praat met je om je psychische veerkracht te verhogen. Per dag is er een pagina met uitleg en een met opdrachten

Hoe bedien je Deary?



- Draai aan de bovenkant om de vriendelijkheid in te stellen. Je zal zien dat hen van vorm verandert.
- Druk op de knop om hen wakker te maken
- Zeg iets als 'hallo'. Fijn gesprek!

Dag 1 - uitleg

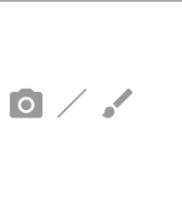
Neem 10 minuten van je dag om deze dag van de diary study uit te voeren. Stel Deary in op vriendelijk. Dat is als hen er helemaal bol en organisch uitziet, zoals aangegeven op het plaatje hiernaast. Start het gesprek. Deary leidt je erdoorheen.



Ethical Review Form

Dag 1 - opdrachten

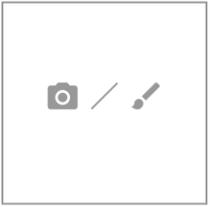
Hoe aangenaam vond je het gesprek?	Wordt je dag waardevol? waarom?	Wat symboliseert het best je dag?
--	---------------------------------------	---

_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	

Ethical Review Form

Dag 2 - opdrachten

Hoe aangenaam vond je het gesprek?	Wordt je dag waardevol? waarom?	Wat symboliseert het best je dag?
--	---------------------------------------	---

_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	

Dag 2 - uitleg

Neem 10 minuten van je dag om deze dag van de diary study uit te voeren. Stel Deary in op neutraal. Dat is als hen er een beetje hoekig maar wel losjes uitziet, zoals aangegeven op het plaatje hiernaast. Start het gesprek. Deary leidt je erdoorheen.



Dag 3 - uitleg

Neem 10 minuten van je dag om deze dag van de diary study uit te voeren. Stel Deary in op antagonistisch. Dat is als hen er helemaal strak en hoekig uitziet, zoals aangegeven op het plaatje hiernaast. Start het gesprek. Deary leidt je erdoorheen.



Dag 3 - opdrachten

Hoe aangenaam
vond je het
gesprek?

Wordt je dag
waardevol?
waarom?

Wat
symboliseert
het best je dag?

_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	

Dag 4 - uitleg

Neem 10 minuten van je dag om deze dag van de diary study uit te voeren. Stel Deary in zoals je zelf wil. Kijk eventueel terug naar vorige dagen voor de instellingen. Start het gesprek. Deary leidt je erdoorheen.



CXXXV

Ethical Review Form

Dag 4 - opdrachten

Hoe aangenaam
vond je het
gesprek?

Wordt je dag
waardevol?
waarom?

Wat
symboliseert
het best je dag?

_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	

Hoera!



Laat het weten aan Simon. Hij komt binnenkort langs om de spullen op te halen en voor een klein interview.

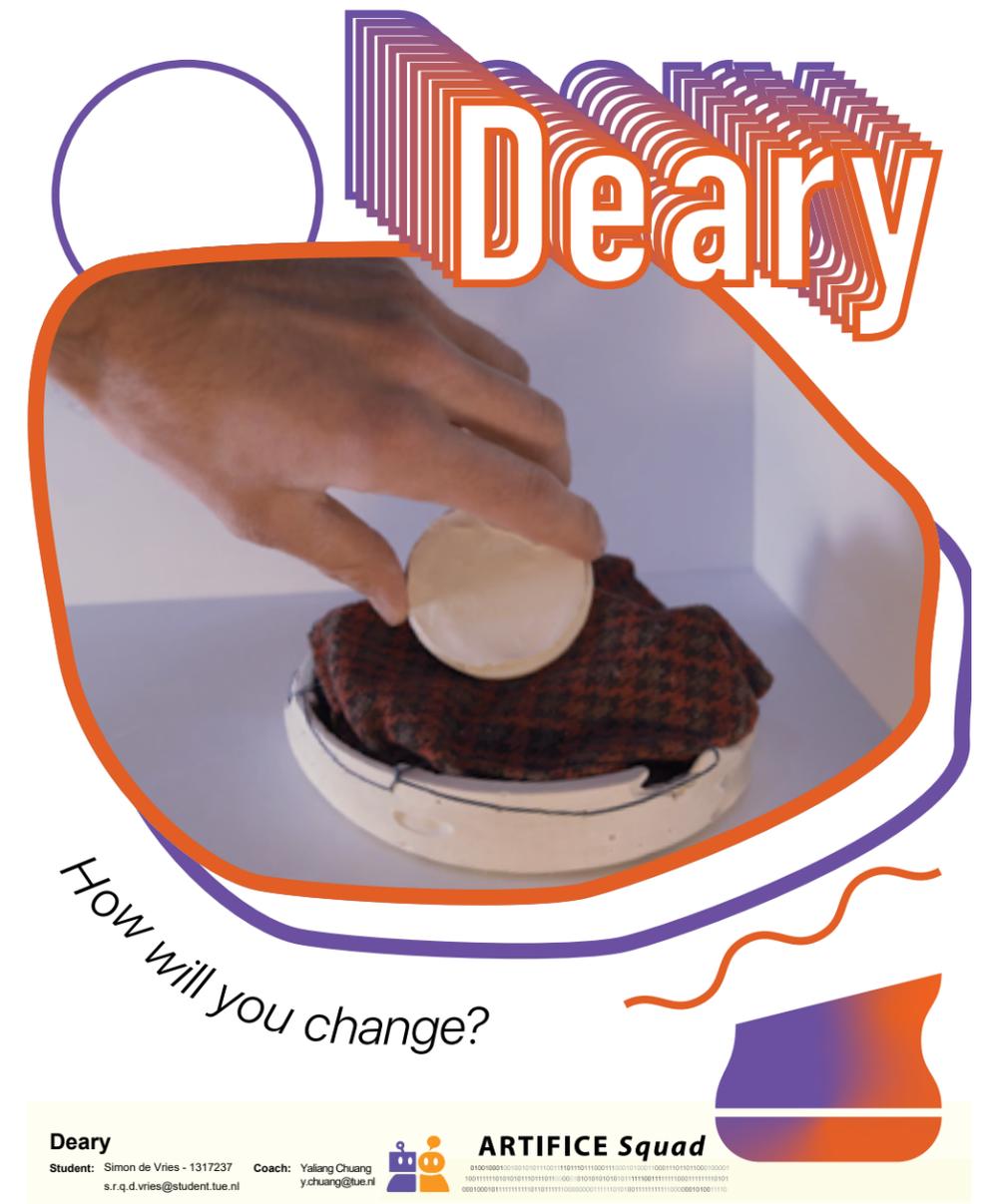
T: Deliverables midterm demo day

You can view the midterm video at <https://vimeo.com/639481000>.

CXXXVI

U: Deliverables final demo day

You can view the final video at <https://vimeo.com/664277937>.



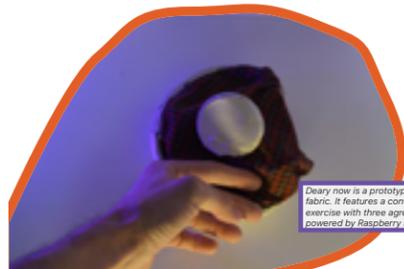
CXXXVIII

Process Overview

1. Start

Discovery | Define, ideate, Prototype, Empathize
Weeks 1 - 9

We start at the product as Deary is now. But How did it get here?



Deary now is a prototype made of plaster and fabric. It features a conversational defusion exercise with three agreeableness settings and is powered by Raspberry Pi and Dialogflow.

Artefacts



A poster for recruiting research participants early on

Activities

The first weeks of the process consisted of reading up on designing for and with AI. I decided to go in the direction of personality in AI and creating trust and transparency by letting users choose themselves how the AI should work.



An early prototype. The goal of the product was to help people sleep better. Personality could be tuned on agreeableness.

Outcomes

The direction of my project was decided. User tests indicated that simplicity was good for the user experience. An interview with a doctor specialized in sleep indicated that there is potential in using conversational AI to help with building healthy behaviour. However, sleep was too broad for a conversational product to effectively target and evaluate.

2. Redefining

Discovery | Empathize, Define, Ideate
Weeks 9- 12

Activities

In this stage of the project, I sought a less person-specific purpose for my product. To find this, I reflected and read several papers. To find out how people would like my product to look and feel, I hosted a participatory design session. I also interviewed psychiatrists to find a speech protocol for my product.



Examples of lo-fi prototypes made during the participatory design session. They are focused on interaction, material and story.

Outcomes

During redefinition, the purpose of Deary went from being something to talk to in general to helping reduce stress in Dutch students through building resilience. The participatory design session made clear what materials and shapes were perceived as agreeable and disagreeable. This led to the decision to use plaster (disagreeable) and fabric (agreeable) as materials. Furthermore, the session gave birth to the idea to use shape-change as a manner of feedback on the personality setting. The interview with psychiatrists informed me that ACT is a good method to increase resilience.

Artefacts

3. Final Design

Development | Ideate, Prototype
Weeks 12-15

Activities

After redefining the purpose of my product, I applied the outcomes of the participatory design session in a shape-changing design. Next to that, I followed an ACT module to learn how the therapy works. Through programming and physical modeling, this resulted in the prototype you can see on this web page.

Artefacts



Model of the mechanical structure of the intended prototype

Outcomes

The outcomes are what you see on this website. But that is not all. In this phase, I came up with a shape-changing design and made a 3D model for the mechanics. However, my design did not work mechanically. I also defined the procedure for a coming cultural probe study. This will be discussed in the future works section -->



Cultural probe booklet and camera



Sketches of the envisioned shape change and interaction

4. Future Works

Woah. That was a whole process!
What would be the next steps?

1. Cultural Probe

I have developed a cultural probe to get qualitative data on the experience users get when using Deary for four days. The probe also features a camera with which participants can show their daily activities. By deploying this probe, a personal view of the environment in which Deary would be used will be shown. This can then be used as inspiration for further development.

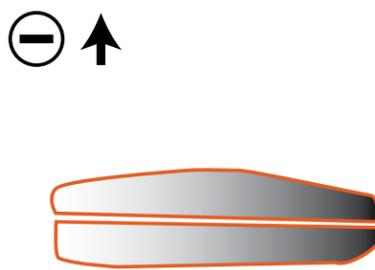
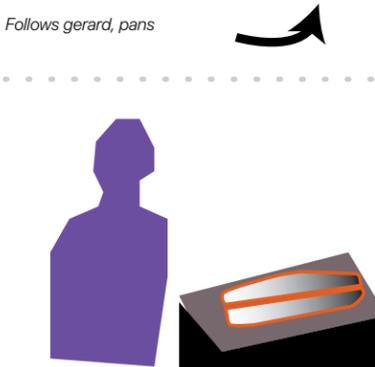
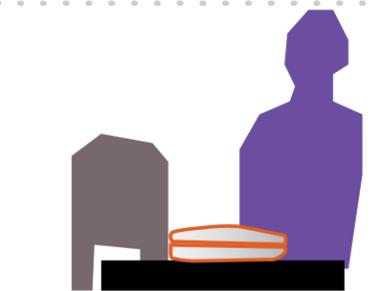
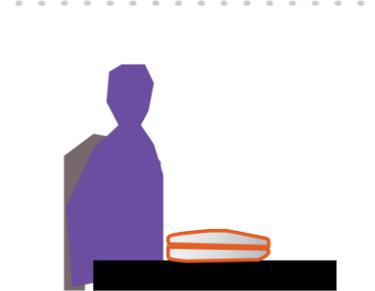
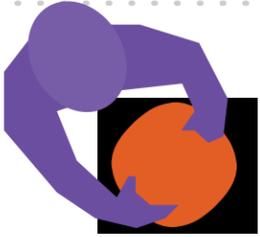
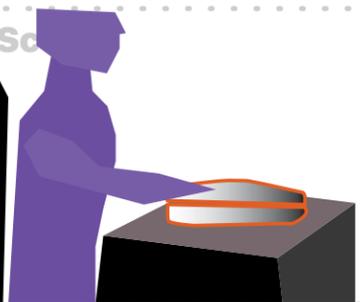
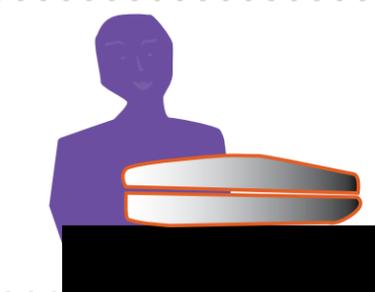
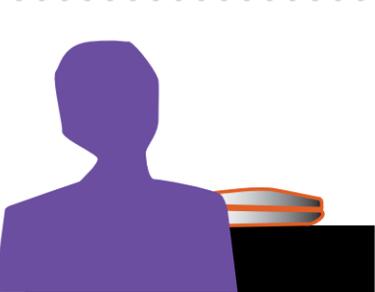
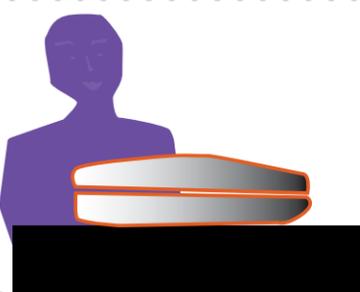
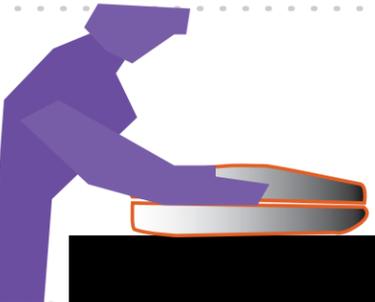
2. Mechanical Engineering

To create augmented feedback on the current personality setting of Deary, I have envisioned a shape-changing design. This design changes from a agreeably-perceived shape to a disagreeably-perceived shape. To further develop the product, engineering this shape change would help create a better user experience.

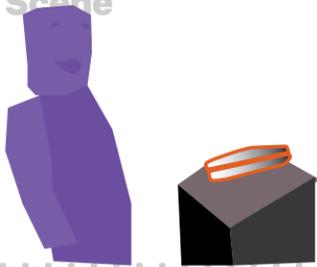
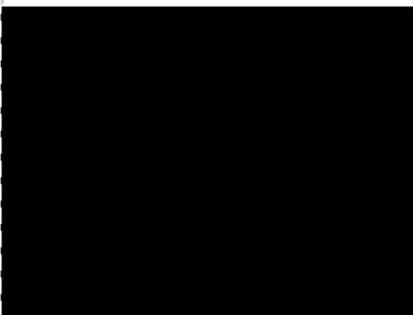
3. Expand and iterate

The prototype right now only offers one exercise on one of the five facets of ACT. Next to that, it only features three personality settings. In an ideal world, Deary would be able to help a user through a whole ACT process, with very many steps between agreeable and disagreeable. By expanding the functionality and evaluating it with users and experts (including people who followed ACT), Deary could be brought close to the ideal-world situation.

This is the storyboard for the video

<p>Camera Noine</p>	<p>Sliding slowly - close up - front</p>	<p>Sliding slowly - close up -front</p>	<p>Zooms out and goes up. Shows room.</p>	<p>Chest level. Gerard walks in. Follows Gerard from the perspective of Deary.</p>
<p>Scene Deary Deary Deary</p> 				
<p>Text If we are not always happy, why should AI be?</p>	<p>Deart can be a dick</p>	<p>But they're here to help</p>	<p>We could all use some</p>	<p>For example, take Gerard.</p>
<p>Follows gerard, pans</p> 	<p>From enter gerard, has turned 90 degrees. Chair revealed.</p> 	<p>Same sht (waist level, medium). gerard sits down Start zooming in to Gerards face</p> 	<p>Zooms in to close up chest level. Portrait</p> 	<p>Pans to overhead, medium shot Zooms in to hands</p> 
<p>An aware workaholic.</p>	<p>He wants to spend more time with his friends and himself</p>	<p>Deary helps him commit to this value.</p>	<p>"Ik moet wel echt gepusht worden. Ik zet hem daarom op onaardig"</p>	<p>*tunes deary*</p>
<p>Camera Pans down while gerard touches deary to activate</p>	<p>Over the shoulder of deary</p>	<p>Jump cut. Over the shoulder of Gerard</p>	<p>Pan to Deary shoulder. See Gerard talk.</p>	<p>Same shot, Gerard tunes while talking.</p>
<p>Scene</p> 				
<p>Text 3 - 5 seconds nothing</p>	<p>"hoi Deary"</p>	<p>"O jij weer, ben je weer eens emotioneel?"</p>	<p>Faint conversation. ("ja, weer een drukke dag. Ik heb nog helemaal niet afgesproken met Lisa...")</p>	<p>The control is in your hands.</p>

cxl

<p>Camera 45 angle shot, medium. Gerard laughs. Slight change in color/filter --> happier. Follow Gerard now.</p>	<p>Overhead, medium shot. blurs` `</p>	<p>None. Dissolves into shapes and white?</p>	<p>Orange - purple background.</p>	
<p>Scene</p> 				
<p>Text If you want, make Deary agreeable.</p>	<p>Just think of some variation.</p>		<p>How will you change?</p>	<p>* Sound effect that fits the music*</p>
<p>Fade to black</p>	<p>none</p>			<p>Camera</p>
	<p>Short credits in SF Pro Light Italic For example, the music And Pieter</p>			<p>Scene</p>
<p>* Silence*</p>	<p>* Silence*</p>			<p>Text</p>
<p>Camera</p>				
<p>Scene</p>				
<p>Text</p>				