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FINAL DOCUMENT

INTERACTION DESIGN MASTER PROJECT . INTERACTION DESIGN MASTER DEGREE

THE SPACE IN BETWEEN THERAPY SESSIONS

WHERE INTERACTION DESIGN AND CLINICAL PSYCHOLOGY MEET

Ana Rita Pinto de Matos Branco

SUPERVISORS
Marco António Neves da Silva, PhD.
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JURY
Francisco dos Santos Rebelo, PhD.
Paulo Ignácio Noriega, PhD.
Sónia Isabel Ferreira dos Santos Rafael, PhD.

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‘We must broaden our definition of design and designers. We must test our assumptions about human beings. We must wonder ‘who am I excluding?’ and allow the answers to change our solutions.’

- Holmes, 2018

ABSTRACT

The purpose of this final project was to find a common ground between interaction design and clinical psychology through the exploration of the space in between therapy sessions. This process was done through a co-design between the author and a clinical psychologist. Now-a-days, more and more psychologists give contact information and allow for contact outside of therapy sessions because patients often feel the need to have extra support on their day to daily lives. There isn't however a platform that allows patients to keep on making progress without a dependency from an answer from the psychologist. The methodology applied involves a literature review of all the areas: mental health, mobile and e-health and gamification, applied to health. Followed by the choice and analysis of case studies and exploratory interviews with several clinical psychologists to better understand the needs of patients as users of the system to be developed. An interaction design project was developed, which consist on wireframes and prototypes of all fidelity types until we reach a high fidelity prototype to test in real patients provided by the clinical psychologist in question. As such, this project aimed to create a system, or a platform that allows the space in between therapy sessions to also be a place of personal development and progress, through a tool created with the aid of the clinical psychologist.

KEYWORDS

Interaction Design; Clinical Psychology; Mental Health; E-Health

RESUMO

O objetivo deste projeto final de mestrado é encontrar um ponto comum entre design de interação e psicologia clínica através da exploração do espaço entre sessões de terapia. Este processo foi desenvolvido em co-design entre a autora e um psicólogo clínico. A metodologia aplicada envolveu revisão da literatura de todas as áreas: saúde mental, saúde em dispositivos móveis e saúde electrónica e gamificação, aplicada à saúde. Seguidamente, procedemos à escolha e análise de casos de estudo e a entrevistas exploratórias com vários psicólogos clínicos. A fase de projeto consistiu em wireframes e protótipos de vários graus de fidelidade até chegar a protótipos de alta fidelidade que foi posteriormente usado em testes de usabilidade com pacientes em terapia. Hoje em dia, cada vez mais psicólogos providenciam as suas informações de contacto pessoais, como email ou número de telemóvel, para permitir o contacto, caso os pacientes precisem de apoio extra entre consultas. No entanto, a plataforma não vem tentar substituir a terapia mas sim facilitar um espaço ou um local que permita o paciente continuar a trabalhar no seu progresso entre as sessões, através da criação de exercícios e ferramentas, que foram pensadas em conjunto com o psicólogo.

PALAVRAS-CHAVE

Design de Interação; Psicologia Clinica; Saúde Mental; Saúde Eletrónica

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I'd like to start by thanking my advisors, Marco Neves and Paulo Noriega, who stuck by my side and always helped and guided me even when I felt the most lost. Secondly, my parents for supporting me through this master's but also for believing in me and letting me choose my own path. My aunt, for without her help, my life in Lisbon and this master's degree would have been extremely difficult to manage for both me and my parents. Thirdly, my friends, who put up with endless questionnaires and user tests and helped with animations and translations when I was busier. And just supported me all through this process. Thank you all: Ana, Inês, Madalena, Santiago, Ricardo, Nadya, Paulo, Duarte and of course, my pineapples, Carmen, Juliana and Inês. A special thanks to Mafalda Casais who was a mentor, a guide and a friend throughout all this process. A final very special thanks for Vasco, who always supported my projects and believed in me even when I didn't feel like believing in myself and keeps pushing me to do more and better even though this thesis is now over.

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TABLE OF CONTENTS

Abstract vii
Resumo ix
Acknowledgments xi
Table of Contents xiii
Figure Index xvii
Acronyms and Abbreviations List xxiii
Glossary xxv

1 General Introduction 3
1.1. Scope 3
1.2. Research Problem 4
1.2.1 Research Questions 4
1.3. Argument 5
1.4. Goals 6
1.4.1. General Goals 6
1.4.2. Specific Goals 6
1.5. Research Design 6
1.5.1. Organogram 8
1.6. Project Structure 9
1.7. Chapter's Bibliographic References 10

2 Mental Health and Therapy 17
2.1. Defining Mental Health, Mental Well-being and Therapy 17
2.2. Current State of Mental Health Internet-based and Smartphone Interventions 19
2.3. Mood Tracker Case Studies 21
2.3.1. Mood Trackers 21
2.3.1.1. An Interaction Design Analysis of Mood Trackers 22
2.3.1.2. A First Exploratory Analysis of Mood Tracker Applications 25
2.3.1.3. Limitations of the Study 29

2.4. Chapter's Bibliographic References 30

3 Images and Emotion Evaluative Tools 35
3.1. Literal and Symbolic Messages in Images 35

3.2. Positive Psychology 37
3.2.1 Can Emotions be Measured 37
3.2.1.1. PANAS 39
3.2.1.1.a. How it works 40
3.2.1.1.b. Validity of the scale 40
3.2.1.1.c. Cristicism towards PANAS 41
3.2.1.2. How it works 42
3.2.1.2.a. GENEVA EMOTION WHEEL 43
3.2.2. GEW versus PANAS: Which Could be More Useful? 43
3.2.2.1. Arguments in Favor and Against 44

3.3. Chapter's Bibliographic References 45

4 Applied Research 51

4.1. Project Development 51
4.1.2. Research Questionnaires 52
4.1.2.1. Mobile Mental Health Applications Questionnaire 52
4.1.2.1.a. Respondents familiarity with mental health and therapy 55
4.1.2.1.b. Features 60
4.1.2.1.c. Demographics 61

4.2. Information Architecture, Wireframes and Prototype 62
4.2.1. Name, Logo and Colour choice 64
4.2.2. Wireframes 64

4.3. Usability Tests 68
4.3.1. Method 68
4.3.2. Participants 71
4.3.3. Results 72

4.5. Chapter's Bibliographic References 75

5. Conclusions 78

Bibliographic References 77

Bibliography 83

Appendix A 139

Appendix B 151

Appendix C 161

Appendix D 171

Appendix E 193
Appendix F 199
Appendix G 211
Appendix H 221
Appendix I 227
Appendix J 233
Appendix K 241

FIGURE INDEX

8	**Fig. 1** Organogram (Author, 2020)	
26	**Fig. 2a** Screenshot of Moodpath (MindDoc) (MindDoc Health, n.d.)	https://mymoodpath.com/en/
26	**Fig. 2b** Screenshot of Moody (Reflectly, n.d.)	https://apps.apple.com/us/app/moody-mood-tracker-journal/id1402824590
26	**Fig. 2c** Screenshot of Feelic (Masarat App, n.d.)	https://play.google.com/store/apps/details?id=com.masaratapp.feelic
28	**Fig. 3a** Screenshot of Emoly (Huu Nguyen, n.d.)	https://apps.apple.com/pt/app/emoly-personal-moodtracker/id1137400063?l=en
28	**Fig. 3b** Screenshot of Daily Mood Tracker (Qi Chen, n.d.)	https://apps.apple/. com/pt/app/daily-mood-tracker/id1197947460?l=en
38	**Fig. 4** Geneva Emotion Wheel Version 2.0. (Sacharin, 2012)	Sacharin, V., Schlegel, K., & Scherer, K. R. (2012). GEW Report August 13 2012. Retrieved from https://www.researchgate.net/publication/254759047_Special_issue_editorial_Design_emotion
39	**Fig. 5** The positive and negative affect schedule (Magyar-Moe, 2009)	Magyar-Moe, J. L. (2009). Therapist's Guide to Positive Psychological Interventions (1st ed.). New York, NY: Academic Press Inc.

42	**Fig. 6** Geneva Emotion Wheel (Translated) (Author, 2020. Adapted from Sacharin, 2012)	Sacharin, V., Schlegel, K., & Scherer, K. R. (2012). GEW Report August 13 2012. Retrieved from https://www.researchgate.net/publication/254759047_Special_issue_editorial_Design_emotion
43	**Fig. 7** Geneva Emotion Wheel Axys (Sacharin, 2012)	Sacharin, V., Schlegel, K., & Scherer, K. R. (2012). GEW Report August 13 2012. Retrieved from https://www.researchgate.net/publication/254759047_Special_issue_editorial_Design_emotion
53	**Fig. 8** Analysis of Features - Questionnaire (Author, 2020)	
54	**Fig. 9** People currently in therapy - Questionnaire (Author, 2020)	
54	**Fig. 10** People who have been therapy - Questionnaire (Author, 2020)	
56	**Fig. 11** Graphic for sentence 1 (Author, 2020)	
56	**Fig. 12** Graphic for sentence 2 (Author, 2020)	
56	**Fig. 13** Graphic for sentence 3 (Author, 2020)	
57	**Fig. 14** Graphic for sentence 4 (Author, 2020)	
57	**Fig. 15** Graphic for sentence 5 (Author, 2020)	

57 **Fig. 16**
Graphic for sentence 6
(Author, 2020)

57 **Fig. 17**
Graphic for sentence 7
(Author, 2020)

58 **Fig. 18**
Graphic for sentence 8
(Author, 2020)

58 **Fig. 19**
Graphic for sentence 9
(Author, 2020)

58 **Fig. 20**
Graphic for sentence 10
(Author, 2020)

58 **Fig. 21**
Graphic for sentence 11
(Author, 2020)

62 **Fig. 22a**
Blooming - main screen
(Author, 2020)

62 **Fig. 22b**
Blooming - mood tracker screen
(Author, 2020)

62 **Fig. 22c**
Blooming - mood tracker final screen
(Author, 2020)

63 **Fig. 23a**
Information Architecture - first draft
(Author, 2020)

63 **Fig. 23b**
Information Architecture final
(Author, 2020)

64 **Fig. 24**
Blooming Icon
(Author, 2020)

64 **Fig. 25a**
Blooming Logo Colours
(Author, 2020)

64 **Fig. 25b**
Blooming App Colours
(Author, 2020)

65 **Fig. 26a**
Blooming - Analog Wireframe
(Author, 2020)

65 **Fig. 26b**
Blooming - First Digital Wireframe
(Author, 2020)

69 **Fig. 27a**
Blooming - Journal Screen Prompts
(Author, 2020)

69 **Fig. 27b**
Blooming - Journal Screen
(Author, 2020)

69 **Fig. 27c**
Blooming - Journal Final Screen
(Author, 2020)

70 **Fig. 28**
Blooming - close up of exercise
(Author, 2020)

71 **Fig. 29**
Blooming - chat screen
(Author, 2020)

73 **Fig. 30**
System Usability Scale Score
(Author, 2020)

74 **Fig. 31**
System Usability Scale Percentage
(Author, 2020)

ACRONYMS AND ABBREVIATION LIST

SWB - Subjective Well-Being
DSM - Diagnostic and Statistical Manual of Mental Disorders
UI - User Interface
GEW - Geneva Emotion Wheel
PANAS - Positive and Negative Affect Schedule
CBT - Cognitive-Behaviour Therapy
SUS - System Usability Scale

GLOSSARY

Co-Design

Co-design is often used as an umbrella term for participatory, co-creation and open design processes (Chisholm, n.d.). This approach enables different people, with different backgrounds to contribute in the formulation and solution to a problem. In this specific work, co-design is between and Interaction Design Master's student and a clinical psychologist.

CHAPTER 1 – GENERAL INTRODUCTION

1 GENERAL INTRODUCTION

1.1 SCOPE

Mental Health is nowadays more important than ever. As society evolves and our daily life gets busier, more people face mental illness. However there is still a big stigma surrounding mental health and its main treatment option, therapy (Satcher, 2001; Kieling, 2011; Bor, 2014; Duffy, 2019; Insel, 2019; Baker, 2020).

This project arose in a personal context, among talks with friends who are also in therapy and shared that somehow, they did not want to depend on their therapist to keep making progress, and did not want to feel that the only place they made progress was the therapy room.

Therefore, the need to fill this gap outside therapy sessions was also analysed in exploratory interviews with therapists, to understand their take on it and how they felt about the patient taking the time to explore outside the context of therapy. Therapy is also about applying what is learnt to the real life context, but what if the patient has the need for extra aid or tools?

There are at least three main areas in clinical psychology: psychoanalysis, cognitive-behavioural, and humanistic psychology (Elliott, 2002; Bornstein, 2005; Gaudiano, 2008; Salvatore, 2011; Hayes, 2012; Muse, 2013). For some, such as the humanists and the cognitive-behavioural psychologists, it made sense to design these tools and platforms. For psycanalists, however, such tools do not make sense, as they are of the opinion that the work done in therapy is only to be done in the space of therapy. Considering these responses, the development of this project will be aided by a humanist therapist, as to navigate such different clinical approaches.

This final project aims to see if interaction design can or already has established a relationship with clinical psychology and in which ways this relationship can be improved, focusing on user experience, inclusive design and the patients. Furthermore, it focuses on how patients can have a better experience of therapy with the aid of new technology.

1.2. RESEARCH PROBLEM

Current standings on mental health show that it is a bigger issue in the present day than it ever was. Stigma still surrounds it, but awareness is being raised increasingly each year, especially among the youth (Bornstein, 2005; Kieling, 2011; RSPH, 2017; Duffy, 2019; Sickel, 2019; Baker, 2020).

However, through conversations with therapists and patients who regularly frequent therapy sessions, the idea of the 'space in between' therapy sessions was brought up more than once. As if it were a dead space in the process of recovery and progress. Therefore, it was thought that a solution to this problem made sense to come from the intersections of interaction design and clinical psychology. A platform or tools could be developed so that patients could work through that 'dead space' and feel like progress towards a good and healthy recovery is being made, not only in therapy sessions but also outside of them.

Through interaction design methods such as user research, analysis and testing of the current state of the market and user testing, a platform or set of tools could be developed so that patients could work through that 'dead space' and feel like progress towards a good and healthy recovery is being made, not only in their therapy sessions but also outside of them. This research aims to understand if therapy progress can only be done in therapy and if not, how interaction design can help this space in between therapy sessions be helpful for the patients.

1.2.1 RESEARCH QUESTIONS

How can interaction design merge with clinical psychology in a way that will make the patient progress in therapy not happen exclusively during therapy sessions?
How can interaction design make the work done in between therapy sessions something fruitful for the context of therapy?

1.3. ARGUMENT

After reviewing the literature in the State of the Art section and conducting exploratory interviews with several clinical psychologists from different fields of psychology, we can predict that having a mobile platform that guides and helps the patient navigate life outside of therapy sessions might be a good asset to explore.

What we propose in this project is the ideation of a platform which can help patients seize the space in between therapy sessions to keep on working on themselves.

We aimed to do this in a way that does not hinder the therapy session, but brings something more to it, since the patient may have already explored and thought about what they want to talk about in the next session. This project is also not meant as therapy replacement, but rather a therapy enhancement.

Towards this aim we considered the best possible solution would be a mobile application due to its portability and ability to accompany the patient in everyday life. The main feature of the application is a redesign of the mood tracker concept, accompanied by a journal with the option for guided journaling through exercises the therapist will give to the patient. The application aims to guide the patient outside the therapy sessions and help improve communication in the subsequent session.

1.4. GOALS

1.4.1. GENERAL GOALS

Develop an interactive system with a therapeutic base, to allow for the creation of progress spaces in between therapy sessions.

1.4.2. SPECIFIC GOALS

With this final project we aim to understand how interaction design can be applied to a clinical context. Moreover, we aim to understand what can and cannot be done through interaction design in a clinical context, so that safety and well-being of patients is the biggest constant.

Furthermore, we aim to motivate patients to do the extra work and keep progressing in between therapy sessions. Finally, we aim to keep patients motivated in between therapy sessions.

1.5. RESEARCH DESIGN

The development of this project began with definition of a field of interest where an interaction design project could be applied. The chosen field was psychology, and the context was the space in between therapy sessions to improve it for the patient.

The overall methodology of this project is classified as a mixed, non-interventionist and interventionist methodology.

We used a qualitative and non-interventionist methodology to conduct a literature review, which allowed for the definition of key words, the structuring of the theoretical framework and the formulation of the argument. To complement the literature review, we carried out case studies to frame our contribution to current practices.

We then applied a qualitative and interventionist method when conducting interviews with clinical psychologists. The aim of these interviews was to understand what the field is lacking and how the inclusion of technology could be perceived.

Towards the end of the project we used a quantitative and interventionist methodology, namely a quasi-experiment in the usability testing.

The organogram (Fig. 1) proposes a framework which goes through three main phases: the literature review, the case studies and their analysis, and exploratory interviews conducted with clinical psychologists. Through this, the argument was formed.

With the argument in mind, we advanced into project development, an iterative process where prototypes were made, tested and adjusted. From these results conclusions were formed and the research questions were answered.

We summarised the contributions of the project and suggested further research that can be done in the research areas.

1.5.1. ORGANOGRAM

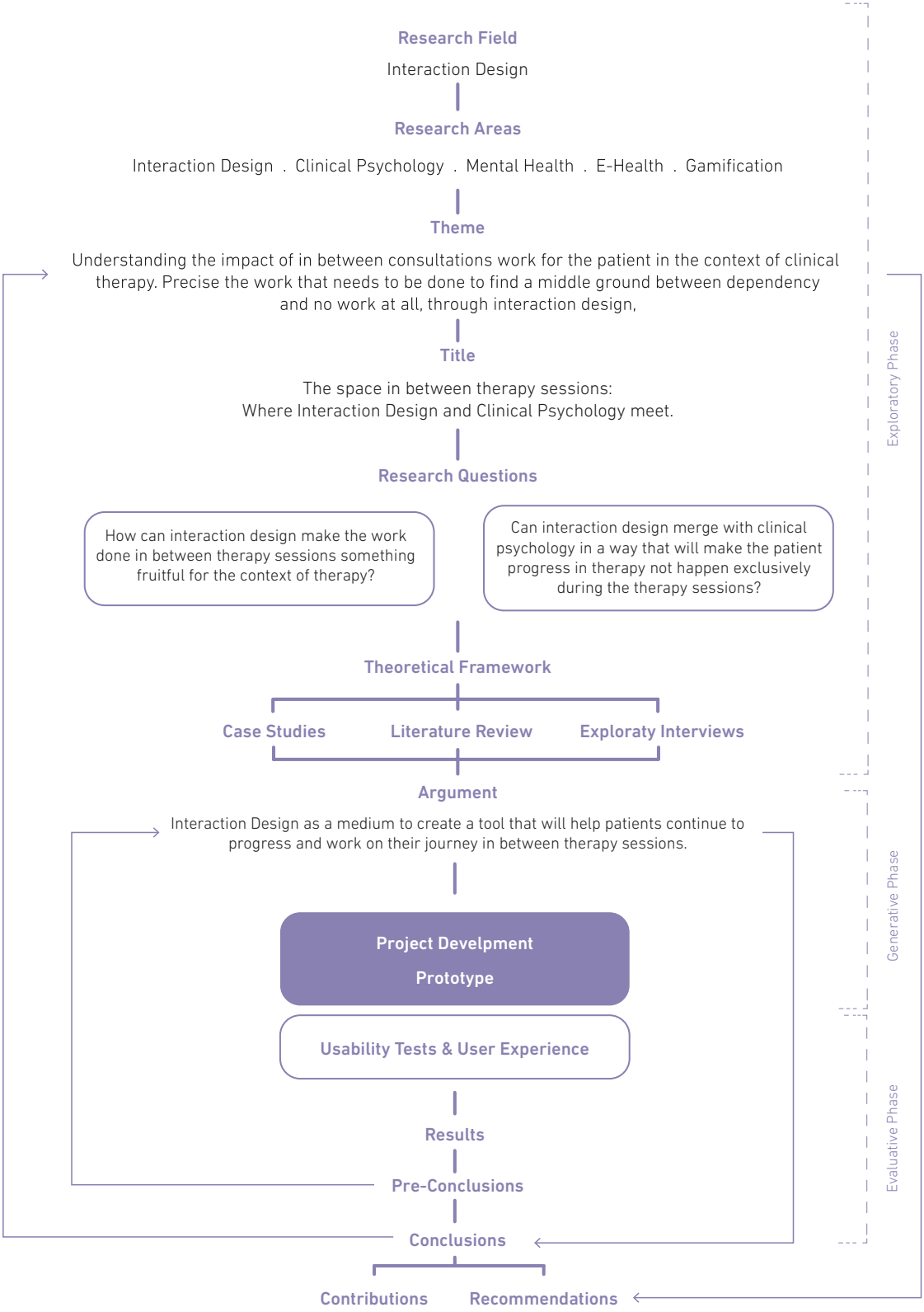

Fig. 1. Organogram, (Author, 2020)

1.6. PROJECT'S STRUCTURE

We first start by, in chapter two, introducing and defining the concepts of mental health, mental wellbeing and therapy.

Subsequently, we do an analysis of internet-based mental health interventions. Following this, we introduce a case study of mood tracker applications and the respective results. We then propose a re-design of mood tracker applications.

In chapter three, we analyse the literal and symbolic meaning of images and how this can be applied to mood tracker applications.

Finally in chapter four, we go into detail about the project development, all the questionnaires and studies, as well as usability tests that were done and draw final conclusions.

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CHAPTER 2 – MENTAL HEALTH AND THERAPY

2 MENTAL HEALTH AND THERAPY

2.1. DEFINING MENTAL HEALTH, MENTAL WELL-BEING AND THERAPY

While there is no consensus on a definition of mental health, it can generally be described as an absence of mental illness (Manwell et al., 2015). The state of being mentally healthy can be defined as a general state of well-being that includes biological, psychological and social factors in the individual's life, which contribute to a good ability to function within the environment and society (Desmet, 2013). Therefore, mental illness is not only associated with emotions but also with physical well-being, and in some definitions it is also associated with self-perceptions and feelings of self-worth (Manwell et al., 2015). Definitions on mental health may also vary according to cultural, clinical practices and different values, which may include their own definition of well-being, and may vary from the one in the western societies. However, for the purpose of this project, we define mental health as a state of general well-being that encompasses biological, psychological and social factors, which help the individual maintain a healthy lifestyle towards themselves and the outside world.

Mental well-being has mostly been addressed by psychology as 'subjective well-being' (SWB) and defined as 'an individual's own, internal evaluation of their quality of life' (Thieme, 2015, p.3), which makes it hard to measure objectively. However, SWB according to the literature seems to be related to three different areas: emotional well-being, psychological well-being and social well-being (Pressman, 2017). 'These perspectives are primarily informed by Western Psychology research' (Thieme, 2015, p.3).

Therapy is the process in which patients and psychologists work together and has the main objective of making the patient mentally healthy and capable of functioning properly in society. The definition of therapy changes slightly with every therapist one talks to. A survey done at TalkSpace (an online and mobile therapy

company), gathered several definitions of what therapy is to each one of their licensed therapists. If we merge these definitions together we can arrive at one that touches on several important points of therapy: a dynamic communication process between patient and therapist, which provides the patient with the long-term tools for reflection, self-improvement and commitment that help shape a new perspective and increased understanding, with a focus on empathic and safe space (Rauch, 2016). However, 'a considerable gap exists between the extent of mental health suffering and the prevalence of help-seeking behaviour in many industrialized societies' (Stead, 2010, p.1). This suggests that mental health is not an issue as big as it should be. People tend to think that because the problem cannot be seen, that it is not there, or it is not something worth worrying about or paying for to get treatment.

2.2. CURRENT STATE OF MENTAL HEALTH INTERNET-BASED AND SMARTPHONE INTERVENTIONS

Mental Health is becoming an increasing problem in today's society (Miralles, 2019; Radovic, 2016). And although therapy has proven effective in most cases, some argue it is unlikely that therapy alone can carry all the work. Nowadays mental health related internet/mobile-based interventions are becoming more common (Miralles, 2019). A 2013 global study found that 17.6% of the adult population suffered from what could be considered a mental disorder according to the DSM, in the past 12 months (Steel et al, 2014).

Stress is a big problem in today's society, and studies suggest that stress and procrastination are heavily correlated with poorer mental health (Stead, 2010, p.1). The same study also suggested that females of older age are more likely to seek professional help - however, this study is from 2010, and we believe that there is currently a shift in mental health awareness in teenagers and young adults.

There has been an increasing amount of mental health related internet/mobile-based interventions in smartphone markets targeting mental health (Chan, 2015). However, there are no clear guidelines, rigorous evaluation or therapists and clinicians' colaboration in their construction (Chan, 2015; Caldeira, 2017). However, previous research proposed an evaluation criteria that not only focuses on the usefulness of said applications, but also usability factors and integration dimension, meaning privacy and security, which are one of the main concerns among clinicians when suggesting or researching mobile applications to incorporate into therapy (Chan, 2015; Powel, 2014).

The amount of applications one can find just by searching the term 'mental health' in any Mobile Application Store has been exponentially growing through the past few years; however, a study published in Nature Digital Medicine, found that 38 percent of application stores' descriptions included wording related to claims of effectiveness, whereas only 2.6 percent provided evidence to substantiate such claims (Larsen,

2019). In another study (Table a.) (Radovic, 2016), out of 208 applications analysed, 123 did not state any source of information supporting mobile application use for mental health diagnosis, which corresponds to 59% of the analysed applications. Only 7% mobile applications used as source national guidelines and DSM criteria. Given the number of mental health applications appearing in application stores every week, 7% is too small of a number for applications that actually follow some kind of guidelines. As such, proper guidelines should be established in the field of mental health applications.

Table a. Mental Health - Specific Characteristics of App, N=208. Adapted from: Radovic, 2016

All categories are not mutually exclusive except for mention of confidentiallity.
[a] Categories of impulsivity, memory and personality disorder, post-partum depression, dementia, amnesia, self-injury, autism, somatoform disorder, eating disorder, learning disorder, substance abuse, and traume in schools were each 1% or less.
[b] Categories of prediction tool, points or games, brainwave frequencies, mindfulness, conflict resolution, religious support, and heart rate tracking were each 4% or less.
[c] Other type of therapy not mentioned in another category.

MENTAL HEALTH DIAGNOSIS OR SYMPTOM MENTIONED [a]	
Depression	61 (29%)
Anxiety	50 (24%)
General mental health	44 (21%)
Stress	34 (16%)
Posttraumatic stress disorder	28 (13%)
Bipolar	23 (11%)
Bullying	24 (11%)
Sleep Disorder	20 (11%)
Schizophrenia	19 (9%)
Panic disorder	12 (6%)
Obsessive compulsive disorder	11 (5%)
No specific symptom or diagnosis mentioned	11 (5%)
General trauma	9 (4%)
Child trauma	8 (4%)
ADHD	8 (4%)
SOURCE OR INFORMATION SUPPORTING APP USE OR MENTAL HEALTH DIAGNOSIS	
Not stated	123 (59%)
Research evidence	48 (23%)
Professional experience	23 (11%)
Personal experiences or stories	18 (9%)
National guidelines	8 (4%)
DSM criteria	7 (3%)

APPROACHES TO IMPROVING MENTAL HEALTH USED BY THE APP [b]	
Relaxation	43 (21%)
Stress management	36 (17%)
Symptom tracking	31 (15%)
Calming audio	28 (13%)
Interpersonal support	25 (12%)
Diary or journaling	22 (10%)
Connect with mental health resource	19 (9%)
Support group	18 (9%)
Hypnosis	15 (7%)
Meditation	15 (7%)
Other therapy [c]	14 (7%)
Mood tracking with provider	11 (5%)
Cognitive behavioral therapy	10 (5%)
Crisis management	10 (5%)
Validated diagnosis screens	10 (5%)
PRESENCE OF LEGAL DISCLAIMER	10 (5%)
MENTION OF CONFIDENTIALITY	
No mention of privacy or security	185 (89%)
Assures privary or security	19 (9%)

2.3. MOOD TRACKER CASE STUDIES

2.3.1. MOOD TRACKERS

Mood tracking is the act of registering through a period of time the mood one feels and how day to day life can affect mood; many times to try to find patterns within routines that can be either helpful or harmful towards overall well-being and mental health. This act of tracking one's mood has shown to be helpful when it comes to health management (Nicholas, 2015; Caldeira, 2017). There are several tracking mobile applications in the market, from focusing on tracking the amount of water the user drinks per day, to how many cigarettes they smoke. These habit-tracking apps seem to always be connected to the users wanting/needing help to accomplish a positive change in their life. Mood trackers have some variances as well, from merely allowing the user to input their current mood, to associating the current mood with an event, people, or daily habits, such as exercising.

Mood trackers can be significantly improved by an Interaction Design intervention. For example, a user centered design study and analysis of what users need and expect from mood trackers can provide designers with valuable insight that will allow them to better tend to the users' needs. Furthermore, involving therapists in the process of creating mood trackers can also provide a better understanding of what their patients' needs are and in what ways the therapeutic relationship can benefit from mood tracking.

We developed an analysis of the most popular mood trackers currently in mobile applications stores. The criteria for choosing these mood trackers were both the order in which they appeared when conducting a search in both Google Play Store and Apple Store, and their ratings according to users. In the following sections we report a first introductory analysis using some of the criteria we found important to implement in a future co-designed application with a therapist.

2.3.1.1. AN INTERACTION DESIGN ANALYSIS OF MOOD TRACKERS

From an interaction design perspective, mood tracker applications vary greatly. One example is the T2 Mood Tracker – whose interface is somewhat outdated and narrow, allowing exclusively one thing: tracking moods (only the several moods it has predefined, never just one or two), and it does not do it very well from an user experience standpoint (Saperstein, 2014). Another example is the application Youper - which tries to bring innovation into the mobile mental health world through artificial intelligence, in a chat format, to possibly try and establish rapport with the user.

One big contribution Interaction Design can make towards a better designed mood tracker starts with research. Cooper (2007) begins his interaction design process with research, by comparing types of research (quantitative versus qualitative), and introduces the reader to 'goal-directed design.' Another good contribution Interaction Design can have is the consideration of differences between platforms. Most mood trackers are made for mobile graphic interfaces, which can be a very helpful medium to carry daily use interfaces; however, designing something for a smartphone screen is very different from designing a web browser or a computer application.

The approach we took rests on the criteria defined by several Interaction Design authors (Miniukovich, 2014; Schneiderman, 2018; Sharp, 2019). Our research focused on authors who had previously defined rules for graphic user interfaces and mobile applications. These criteria are adapted to mobile.

The first criteria we chose to analyse was the target audience/stakeholder for each application, since previous studies have shown that some applications in the market are aimed at a general public and not people undergoing therapy (Caldeira, 2017; Stawarz, 2018).

The second one was the input of emotions, focusing on whether it would allow for only one emotion or multiple emotions at the same time.

Humans are complex beings, and it is often very difficult to translate all that we are feeling into one word or emotion. Furthermore, mood can consist of several emotions (Desmet, 2015).

In terms of Interaction Design, we analysed the interaction types (Sharp, 2019), which could be classified as instructing, conversing, manipulating, exploring, or responding. Instructing is defined as the user giving input to a system, which can range from typing in commands into a command line to speaking commands aloud. Secondly, conversing proposes a dialog between user and system. Manipulating requires the users to apply their knowledge of the world around them to the interface in question, either virtual or physical. Lastly, responding is defined as the system starting the conversation with the user and the user being able to choose whether or not to respond to it.

We further analysed interaction styles. Shneiderman (Schneiderman, 2018) separates these interaction styles into five main categories: direct manipulation, menu selection, form fill-in, command language, and natural language . Direct manipulation is defined as simplifying the user's tasks in a familiar way or concept so that it is easier to understand for the user. The author provides examples such as the desktop metaphor and drawing tools in software. Navigation and menu selection, as the names suggest, focus on the use of menus for navigating the software. This interaction style provides users with an easily accomplished task 'with little learning or memorization in just a few actions' (Schneiderman, 2018). Form fill-in is a common type of data entry, generally used in registration forms for fields such as date of birth and country, it is usually pre-filled and requires only simple selection from the user. The previous three interaction styles were the only ones observed in the mood tracker applications. Command language requires a more frequent user and provides users with a strong feeling of being in control (e.g., programming) and natural language, although used in a lot of mobile phones nowadays, has not really been transferred over to a lot of mobile applications. Natural language can be anything from text-to-speech, to the user being allowed to give commands just by speaking (e.g., Siri, Alexa).

We then proceeded to analyse the visual complexity of each individual application. For this, Miniukovich and Angeli (2014) provided some useful guidelines, mostly about how information can be displayed in mobile screens (Table b). They

separated visual complexity analyses of mobile applications into three different sections: amount of information, organization of information, and discriminability of information.

Table b. The classification of visual complexity determinants. Adapted from Miniukovich and Angeli (2014)

INFORMATION		
Amount	Organization	Discriminability (Hierarchy)
• Clutter • Dominant colors • Color depth	• Symmetry • Ease of grouping prototipicality • Grid	• Figure-ground contrast • Edge congestion

The amount of information was defined because, from a psychological point of view, less clutter and information shown in a screen means less workload. Therefore, it is more usable in terms of interaction with the system. Adapted to the visual domain this translates into color dominance and color depth as the use of 'too many dominant colors make the user perceive a GUI as complex' (graphical user interface) (Miniukovich, 2014, p.32). Lastly, clutter and amount of information presented to the user are also to be taken into consideration.

Organization of information can be explained by research in psychology that found a preference for symmetry and grid-based visual arrangements, as 'regularity and repetition contribute to figural goodness' (Miniukovich, 2014, p.33).

Discriminability of information can be defined as making the task of assimilating provided information easier for users. In small mobile screens being edge congestion, as the lack of open spaces makes it more difficult for the human eye to perceive information and figure-ground contrast, which if done well reduces the effort and speed with which users can assimilate the information provided.

An important observation we made was whether the applications used the aid of images in their interface, specifically in the tracking of moods, to understand each emotion.

Furthermore, we analysed the applications' design in terms of occupying any space within therapy sessions and if their development was aided by specialists in the area.

2.3.1.2. A FIRST EXPLORATORY ANALYSIS OF MOOD TRACKER APPLICATIONS

For this analysis, we chose 29 applications that were advertised in their respective application stores as mood trackers. However, upon using the applications, we excluded three for either paid content or because they were not actually mood trackers, but mental health related 'testing' applications. We were left with 26 applications[1] that were analysed. Out of the 26 analysed applications, 11 were iOS-only applications, seven were Android OS only, and four were available for both operating systems.

The first observed criteria was stakeholders (target audience), and, as Caldeira (2017) predicted, most of the analysed applications are aimed towards a more general public: correspondingly, from the 26 reviewed applications, 19 were aimed at a general public.

The second criteria concerned emotion input, that is, if more than one emotion was possible to be inputted into each mood tracker. We found that from the 26 analysed applications, only eight allowed for multiple emotion input, and two of these allowed for input of multiple emotions exclusively, which were predefined by the application itself.

Subsequently, we proceeded with the Interaction Design analysis. Regarding interaction types (Schneiderman, 2018), all applications used touch, since they were designed for smartphones. Nine also made good use of sliders, which fall under the 'instructing' category concerning

[1] The full list of analysed applications is as follows: T2 Mood Tracker, Moodnotes, Daylio, Moodpath, Youper, Mood Log, Mood Tracker, Breeze, Moody, Emoly, iMood, Modeline, MoodPanda, Feelic, Mood App, Moodflow, Jade, Free Mood, Tracker, Puncher, Mood Patterns, Moodily, Pixels.

interaction types. However, there are several layers that can be explored and several applications (15 out of the 26) had a reminder option, in which the user tells the application that he wants to be reminded to interact with it, which can fall under the 'responding' category. If the users choose to respond, it then turns into 'instructing.' One of the applications in particular used an AI (artificial intelligence) based chat system, in which the AI would ask questions and give answers as options. This can fall under all three categories: instructing, conversing, and responding.

From Shneiderman's (2018) approach to interaction styles mentioned in the previous section, smartphone applications seem to mostly use navigation and menu selection. Some of the analysed applications used this style exclusively, while 10 of them also required direct manipulation, mostly seen in the ones that made use of sliders.

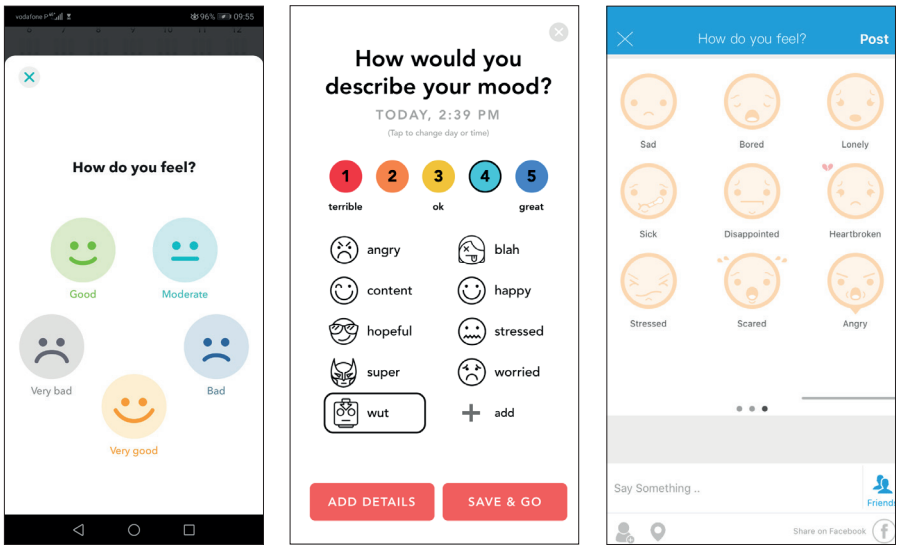


Fig 2a. Screenshot of Moodpath (now called MindDoc) (MindDoc Health, https://mymoodpath.com/en/); Fig. 2b. Screenshot of Moody: Mood Tracker & Journal (Reflectly ApS, https://apps.apple.com/us/app/moody-mood-tracker-journal/id1402824590); Fig 2c. Screenshot of Feelic - Happiness Network, Mood Track (Masarat App, https://play.google.com/store/apps/details?id=com.masaratapp.feelic)

We found that image use is very popular among mood tracker applications, especially the use of emoji/face (Fig. 2a, Fig. 2b, Fig. 2c) icons associated

with a word. However, from the 18 applications that used images on their interface, none stepped away from the traditional association of an emoji/face with a corresponding emotion word; images were used solely with the purpose of helping put an interpretation to the words.

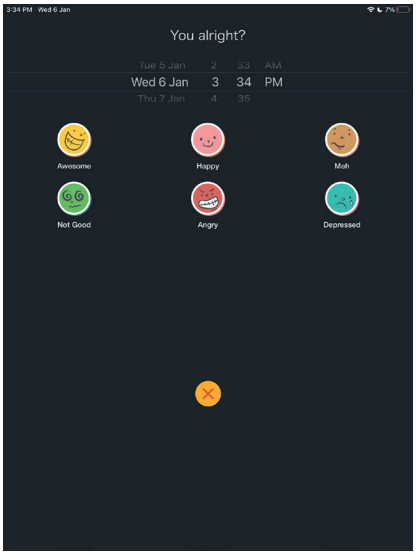
Dividing visual complex into the three classifications established by Miniukovich and Angeli (2014) (Table b), we started by analysing the 'amount' column, finding that only 10 out of the 26 applications analysed showed a clear dominant color and had no clutter, meaning that the spacing in between words and images allowed for a clear and easy understanding of the application. A few applications (three) seemed to follow no rules and present no contrast or depth, making them hard to use and straining the user's eye, also having too many colors or too much white and a lot of blank space.

Regarding organization of information, a significant amount of the analysed applications (15 out of 26) made use of a layout grid, a basic structure as the base of the UI[2] (user interface) design. The usage of grid has several advantages in terms of visual interface design, from a usability standpoint, it helps regularise the position of elements. Having a standard layout grid can also make the designing and using of the application easier, as every page follows the same layout, it is more aesthetically pleasing, and reading and understanding the layout is also easier from the user's perspective (Cooper, 2007, Miniukovich, 2014).

The two topics mentioned in discriminability of information are contrast and edge congestion, and most visual interfaces nowadays tend to have a good contrast. According to our findings, 14 out of the 26 applications had a good use of the figure-ground contrast. Text was clear and easy to read and there were clear distinctions between figure/text and background. However, a considerable amount of the applications analysed suffered from edge congestion, that is, a lack of open space, the need to share too much information in small screens often leads to this common problem (Miniukovich, 2014). Seven out of the 26 applications presented some

[2] User Interface is the "interface between users and a product or service" (Soegaard, 2018).

form of this problem. Conversely, however, there were some applications (3) that had too much free space (Fig. 3a, Fig. 3b), as if the screen was too big for the information it was carrying, causing them to have a lot of blank, usually white, spaces.



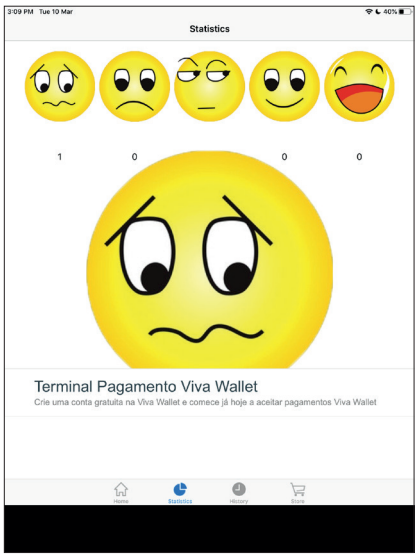


Fig 3a. Screenshot of Emoly (Huu Nguyen Chi, https://apps.apple.com/pt/app/emoly-personal-mood-tracker/id1137400063?l=en); Fig. 3b. Screenshot of Daily Mood Tracker (Qi Chen, https://apps.apple.com/pt/app/daily-mood-tracker/id1197947460?l=en)

Following this, we aimed to find whether these applications took into account people currently undergoing therapy, and whether there was a space they could occupy in the therapy space to help patients. Also taken into account was whether mental health specialists or doctors were involved in the creation of each application. When it comes to space occupied in therapy, which is somewhat related to the stakeholders, 19 out of the 26 applications had no mention or applicable use for therapy, while six of them had a possibility to create a report. This report could be shared with a doctor. Some applications did it better, providing a PDF version of it. Others required the doctor to sign up to the application to be able to view it. Only one of the 26 applications was recommended by therapists and was advertised as a companion for therapy. Finally, only

three of the analysed applications were aided by therapists or based on cognitive-behavioural therapy. This indicates that, possibly, most of the applications people are using do not even have scientific methods or approaches, which means that in some cases, they can be more harmful than good, especially if the patient is suffering from mental health issues and trying to get better without recurring to therapy or any type of doctor.

2.3.1.3. LIMITATIONS OF THE STUDY

The biggest limitation of this study is that the selected criteria for choosing the applications had to exclude the paid features and the paid apps available in the mobile application stores. Only the two biggest application stores were considered: Google Play Store and Apple Store; and even though these may be the ones with most applications, there can be ones that are not yet in these platforms that we missed because of the defined criteria.

The constant update and renaming of mood tracker applications was a limitation during this study. Because the study was not carried out during a small time frame, a lot of the applications first studied were either deleted, renamed, or completely redesigned, or both, and this factor made the whole process more difficult and did not allow us to analyse as many applications as initially intended.

Finally, the study presents itself as a first exploratory attempt into the mood tracker ecosystem that has developed in recent years. More studies with the intention of deepening the collected knowledge will be conducted in the context of this research.

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CHAPTER 3

– IMAGES AND EMOTION EVALUATIVION TOOLS

3 IMAGES AND EMOTION EVALUATIVE TOOLS

The main focus of the application we aim to develop was the redesign of mood tracker applications with the use of images. We started by establishing with the psychologist (Appendix A) that the images should have as broad of an interpretation as possible, have a lot of symbolic meaning, for one image to work on various levels to several patients. For this, a study was conducted, where using first the GEW and then the PANAS tools, we aimed to identify which of the selected images had more a symbolic meaning instead of a literal meaning. The previously done study of mood trackers that tried to give us a general analysis of the current state of mood tracker applications served has a base to understand what was lacking and what was working.

3.1. LITERAL AND SYMBOLIC MESSAGES IN IMAGES

Through the previously heuristic analysis, one of the main suggestions of the published paper was to explore the use of images in mood tracker, beyond the 'emoji' or 'face' use. This section expands on that, by exploring connotation and denotation in images and how this could be an asset in creating a new prototype for a mood tracker that focuses primarily on images first and then emotion association, as opposed to the current approach that uses 'faces' associated with emotions. 'Images contain 'coded' information that helps the viewer decide on how they should receive and react to what they are viewing' (Ambrose, 2005, p.6). In a way, images are there to help us interpret the world. Images have been used in psychology for a long time; a very good example of such is the Rorschach

test. However, when considering the market for mood tracker mobile applications, the most predominant element is text, or text associated with images. This study is born from the assumption that images can do a lot more for psychological treatment and mood trackers than just illustrate words, rather being used as the basis of mood tracking.

Barthes (1977) suggested that when observing an image there is usually, at least, a twofold message within it, denotational and connotational. This means images usually have a literal message: if the representation is, for instance, a chair in an empty room, the denotational message we can take from it is just a brief description of what we see. Complementary to denotation, a connotational message corresponds to what we, as observers, associate with said image. For instance, it would not be unusual for people, if asked to associate an emotion with this image, to say 'loneliness'. Our brains see a chair in an empty room and associate empty and a single object with loneliness.

Joly (2019) reinforced that most images, in addition to having a literal (denotational) message, also have a symbolic (connotational) one. This symbolic meaning comes from pre-existing knowledge that the observer has acquired through idiosyncratic experiences. Because of this, while one image might have a cultural symbolism, it can also have a personal one, according to what the user's life journey has been, which is something we assume to be useful in the context of therapy. Going further back to an analysis of Saussure's[3] work, 'the meaning of the sign does not reside within the sign itself, but is generated from the surrounding system' (Lupton & Miller, 1999, p.53).

Ambrose and Harris said that 'there's always a possibility of unwanted misinterpretation' (2005); however, in discussion with a licensed therapist we found that this misinterpretation, or that an image having various connotational meanings and several possible interpretations, may be beneficial for therapy, because making the patient choose or talk about the choice of an image with more connotational meanings makes him/her have to go through a difficult reflection, which in a way will make them more self-aware and help them better interpret their emotions over time.

[3]Ferdinand de Saussure is a linguist scholar who has developed the basis or groundwork of general linguistic theory, who (...) proposed the term 'semiology' in a few compilations of lecture notes taken by his students based on lectures given since 1907 to 1911, which eventually have been published as a book entitled 'Course in General Linguistics' (Yakin, 2014). In Saussure's theory 'the sign can be broken into two parts, the signifier and the signified. The signifier is the thing, item, or code that we 'read' – so, a drawing, a word, a photo. Each signifier has a signified, the idea or meaning being expressed by that signifier. Only together do they form a sign.' (Mediatexthack, 2014).

3.2. POSITIVE PSYCHOLOGY

Images by themselves, without any kind of psychology supporting them would not make a good mood tracker. Our intention is not to create just another mood tracker but with images, but make use of psychology and positive psychology and tools that have been previously developed to expand the impact that the mood tracker can have in aiding therapy patients.

3.2.1 CAN EMOTIONS BE MEASURED?

Emotions are an integral part of the society we live in, interactions we have either with people or objects play a big role in our daily lives. In this context, the need for tools which measure and assess emotional reactions started to play an important part in the world of design, and understanding the consumer/user, and through the need for brands to provide users with a more positive consumer experience (Scharin, 2012).

Emotional design has been an emerging topic within the design field in the past 20 years (Desmet, 2002; Norman, 2004; Ho, 2012), it can be defined as the use of 'psychology and craftsmanship to create an experience for users that makes them feel like there's a person, not a machine, at the other end of the connection' (Walter, 2011, p.2). The main goal of emotional design is to create human-to-human communication, if done right the computer aspect 'recedes into the background' and the personalities come to the foreground (Walter, 2011, p.30). It is as if the design carries an emotion, form or appearance that is fabricated through the user's interaction with the system (Ho, 2012).

Nowadays, several tools, theories, and methods are available to evaluate the emotional experience provided by a service, object, or any design intervention that is created (Scherer, 2005; Watson, 1994; Bradley, 1994). After some research and deliberation, the Geneva Emotion Wheel - GEW and the Positive and Negative Affect Schedule PANAS, seemed to be the ones that might provide

better results, both for understanding the connotational meaning of images, and for application integration.

The GEW is a well-known and well-established tool that will be used to help understand and guide the choice of the images, and to try applying it directly into a mood tracker and therapy. For this purpose we have adapted it to the Portuguese language to apply in this particular study (Fig. 4). The PANAS - Positive and Negative Affect Schedule (Fig. 5), 'is a scale that consists of different words that describe feelings and emotion' (Riopel apud Magyar-Moe, 2009).

Scherer defends that there is no answer to the current number of emotions that a human being can experience (Scherer, 2005); however, these emotion measuring tools are often based of defined basic emotions (Ekman, 1972, 1992; Izard, 1971, 1992; Tomkins, 1962, 1984 apud Scherer, 2005), and different authors propose different approaches to basic emotions, and these are slightly different in the GEW and in the PANAS scales.

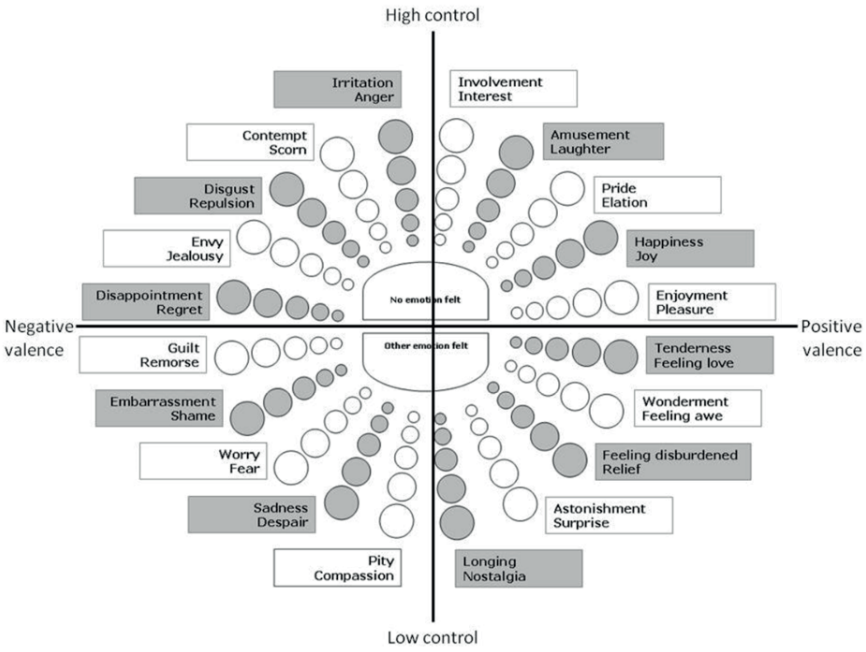
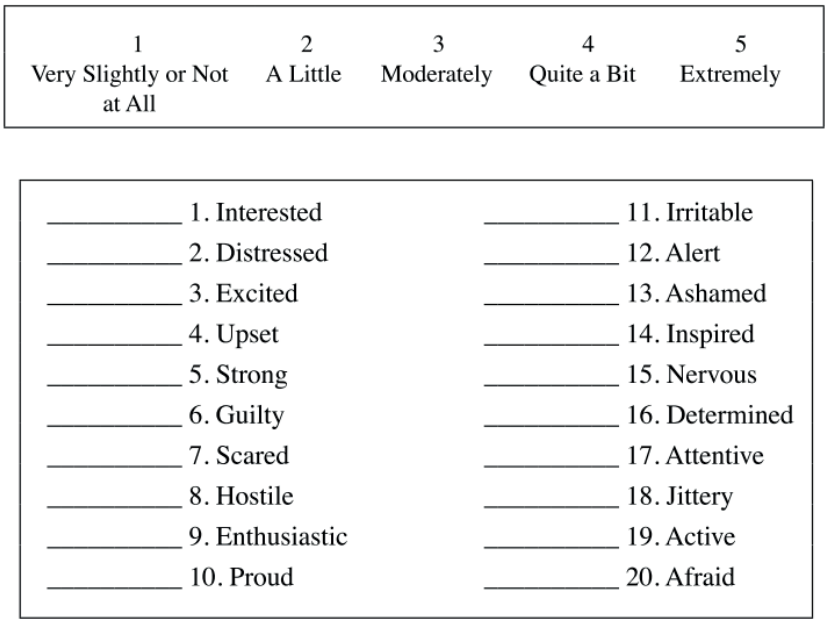


Fig. 4. Geneva Emotion Wheel Version 2.0. Retrieved from: Sacharin, 2012.

3.2.1.1. PANAS

The PANAS was developed by three psychologists: David Watson, Lee Anna Clark, and Auke Tellegen in 1988. This scale consists of words that describe different feelings and emotions. Some measure the positive affect and others measure the negative affect. 'Positive affect refers to the propensity to experience positive emotions and interact with others positively, even through the challenges of life.

Negative affect, on the other hand, involves experiencing the world in a more negative way' (Riopel, 2020). We often assume that negative and positive are on opposite ends of the scale, but it is a spectrum: someone might feel a positive feeling with a hint of a negative one and vice-versa. Riopel (2020) mentions feeling happy for a friend but also feeling a certain degree of jealousy, as an example.



1	2	3	4	5
Very Slightly or Not at All	A Little	Moderately	Quite a Bit	Extremely

_____ 1. Interested	_____ 11. Irritable
_____ 2. Distressed	_____ 12. Alert
_____ 3. Excited	_____ 13. Ashamed
_____ 4. Upset	_____ 14. Inspired
_____ 5. Strong	_____ 15. Nervous
_____ 6. Guilty	_____ 16. Determined
_____ 7. Scared	_____ 17. Attentive
_____ 8. Hostile	_____ 18. Jittery
_____ 9. Enthusiastic	_____ 19. Active
_____ 10. Proud	_____ 20. Afraid

Fig. 5. The Positive and negative affect schedule - PANAS Questionnaire. Retrieved from: Magyar-Moe, 2009.

Magyar-Moe (2009, p.51) described the PANAS as a 'useful tool for therapists who are interested in tracking changes in positive and negative emotions for clients from week to week as they engage in day-to-day life', which has a lot in common with the definition of a mood tracker.

3.2.1.1.A. HOW IT WORKS

PANAS works using a 5 point scale: Very Slightly or Not at All (1 point); A Little (2 points); Moderately (3 points); Quite a Bit (4 points) and Extremely (5 points). The list of words consists of twenty emotions/feelings, ten positive and ten negative, and the participant awards one of the previous scale points to each of them. The final score is the sum of ten of the items on each side of the scale. Scores can range from 10-50 for both the Positive and Negative Affect with the lower scores representing lower levels of Positive/Negative Affect and higher scores representing higher levels of Positive/Negative Affect, depending on the side of the scale they find themselves on (Watson, Clark, Tellegan, 1988).

The list of words is as follows: Interested, Distressed, Excited, Upset, Strong, Guilty, Scared, Hostile, Enthusiastic, Proud, Irritable, Alert, Ashamed, Inspired, Nervous, Determined, Attentive, Jittery, Active and Afraid.

3.2.1.1.B. VALIDITY OF THE SCALE

As conducted tests suggest, the PANAS has a 'very good internal reliability score' (Magyar-Moe, 2009). This reliability seems to be a higher within longer time frames of used with instructions such as "right now" and "over the past week", which means if the patients used it in a daily or weekly basis the reliability of the results is going to be more accurate and therefore, more useful in the context of therapy.

There were several versions of the PANAS scale created over time as they were needed: PANAS-C, which is meant to be used with school-age children (thus it is simpler and helps children have a better comprehension of emotions); PANAS-SF, that was created as a concise version (short form) of the original; I-PANAS-SF, is an international version of the short form, previously mentioned, it is said to have "fewer ambiguities and less room for misinterpretations" (Riopel, 2020); and finally PANAS-X, which is a refined version, further developed by Watson and Clark in 1994. This last version of the scale can be completed in just 10 minutes.

3.2.1.1.C. CRITICISMS TOWARDS PANAS

In her article, Riopel (2020) mentions several criticisms the PANAS usually receives, however, most of it can have a positive upside. PANAS is often considered sensitive to mood fluctuations and subjective, because of its self-report input method. In the context of therapy and the application we aim to develop, this might not be considered very negative. The therapists who are following the patients will be aware of the subjectivity of the scale and with their training may be able to turn this subjectivity into a positive in the context of therapy. The same happens with the connotational meaning of images, the fact that it is connotational and subjective to the participant's world, means that even as a 'universal' scale that it can be turned into an individual assessment tool.

The aim of the use of PANAS in the context of this work is to have the 20 words associated with images with a bigger connotational meaning applied to at home exercise for the patient and as a possible conversation starter on the following therapy session.

3.2.1.2. GENEVA EMOTION WHEEL

The Geneva Emotion Wheel, or GEW (fig. 6) works on a dimensional approach. By dividing a circle into four equal parts, we get two axys, High Control/Power and Low Control/Power, Positive Valence and Negative Valence (fig. 7).

Within each of these four quadrants there are five pairs of emotions, and the option in the center to say that no emotion was felt, or that other emotion was felt. Furthermore, associated with each pair of emotions, there are gradually scaled circles, which signify the intensity with which each pair of emotions is felt.

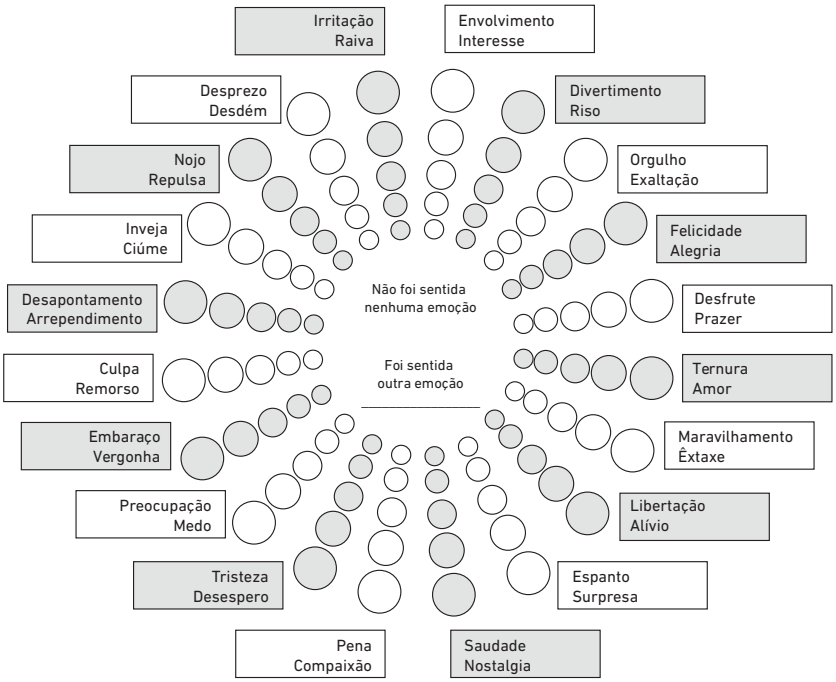


Fig. 6 - Geneva Emotion Wheel (Translated). (Author, 2020. Adapted from Sacharin, 2012).

Within each of these four quadrants there are five pairs of emotions, and the option in the center to say that no emotion was felt, or that other emotion was felt. Furthermore, associated with each pair of emotions, there are gradually scaled circles, which signify the intensity with which each pair of emotions is felt.

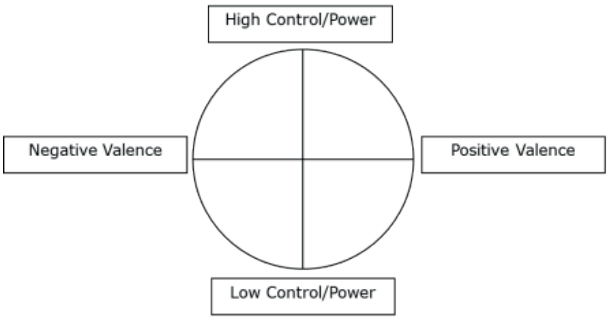


Fig. 7 - Geneva Emotion Wheel axys. Retrieved from: Sacharin, 2012.

3.2.1.2.A. HOW IT WORKS

The PANAS tool as used in the 2012 study (Sacharin, 2012) had the participants study the meaning of each emotion term in the English language, and the definitions of valence and control were also provided to each participant before the rating taks. This tool seems to have a steeper learning curve, or at least preparation curve, for it to be used correctly.

This tool is very complete in the sense that it measures four different dimensions of the emotions, these being: valence or agreeableness of the situation, influence/control over the situation, physiological arousal or excitation and impact (Sacharin, 2012).

3.2.2. GEW VERSUS PANAS: WHICH COULD BE MORE USEFUL?

For the purpose of this thesis, it was decided that having both tools used with the same images and comparing the results might give us a better understanding of which tool would be better suited for the context at hand. Therefore, after a pre-test (n=10) where 36 images were narrowed down to 17, we used the selected images to carry out two different tests with potential users. The pre-test results helped narrow down the images, the criteria for it was that if an image had a 40% or higher rate of agreement in an emotion by the participants, that image had a smaller range of denotative meaning, hence it wasn't as useful in the current context, since more people agreed on the emotion associated to those images.

The aim consisted of looking at the images and identifying from each of the two different scales, which feeling or emotions was associated with each image. Two different tests were conducted, one using the GEW and another one using PANAS, using different groups of people.

Participants were tested from three different faculties, Lisbon School of Architecture, Faculty of Veterinary Medicine and ISCSP (Instituto Superior de Ciências Sociais e Políticas) from the University of Lisbon. These students were between the ages of 18 and 25 (the average age was 19,6) and four were male and six were female. Eight of the participants had secondary education, while two had a master's degree. Six of the participants had previously been in therapy, and only two were, at the time of the test, currently in therapy. The study was conducted presentially, with each one having a GEW on a piece for each image, previously printed and handed out, there was also a trial image to make sure that the participants understood the task at hand.

3.2.2.1. ARGUMENTS IN FAVOR AND AGAINST

The biggest argument against the GEW in the context of the current project is the difficulty of adapting a circular emotion tool, to a small mobile screen. Another big criticism is that the latest version of this tool has been simplified, it now uses a single word, instead of pairs of words, and this can decrease the range of emotions or associations the user makes with it, although for our testing we did use the older version (2012). This tool also has a steeper learning curve for correct use, which is not appropriate for a mobile application that is meant to be easy to use and intuitive.

The PANAS tool can as a list be quite long, 20 emotions/feelings in a mobile screen in a scroll mode can potentially feel tiring to look at from the user's point of view. However, the fact that it is simply a list makes it more easily adaptable to a mobile interface. Another argument in favor of the PANAS tool is that it was actually developed by a psychologist, making it more likely to be well interpreted in the context of therapy and a mobile application used in the same context.

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CHAPTER 4 – APPLIED RESEARCH

4 APPLIED RESEARCH

4.1. PROJECT DEVELOPMENT

This chapter will approach and explain the process of the applied research and project development of the previously mentioned mental health mobile application.

The project started with informal conversations among friends who had gone or were presently going to therapy. In these conversations what seemed to be a very common problem was the lack of progress the patients felt in between therapy sessions, and made us consider deepening this topic.

A first exploratory analysis of mood trackers allowed us to extract some interesting conclusions of what is currently (although everchanging) available on the market. The main problem we found with current solutions on the market was that these had no target audience, they were designed for the general public, as had been previously pointed out by other authors (Caldeira, 2017). The fact that they were designed for the broadest audience possible made it difficult to have a user-centered approach. If we cannot pinpoint who our target users are, how can we possibly define their basic needs and wants from the system we're designing? Following this gap in the medical applications field, we found that there are no guidelines for psycho-medical applications in development. The vast majority of these applications did not take into account specialists' opinions or any type of therapy to guide them in the design. Lastly, the market is currently overflowing with mood tracker applications that are more of the same, they all have the exact same functions, some with a bit more detail, some with less, but overall, they are all slightly altered versions of each other, none bringing anything new to the table.
What this project suggests is a new approach to mood trackers and mental health applications in general. One that started with user research and evaluating what

already exists through heuristics and interaction styles and types. Several user queries were conducted.

For the mood tracker, we decided to invest on tools that had already been designed to deal and classify emotions. In this case, the Positive and Negative Affect Schedule (PANAS) and the Geneva Emotion Wheel (GEW). We also observed that a lot of the images used in mood trackers were "emojis" or facial expressions, usually associated with words. In conversation with the therapist (Appendix A) we are co-designing the application with, we opted for another route: the use of images, that allow several users to associate a vast amount of emotions/feelings with each of them. And only after the user has chosen an image, would the emotions be associated with it. We tested the use of theses images with both the PANAS scale and the GEW and the results were similar, so we opted to use the PANAS tool, because seeing that we are designing a mobile application, the Geneva Emotion Wheel would have to be rearranged to work in mobile thus, we would not be using the same exact tool that was tested.

In the following sections we will explain in more detail the choices for the application and illustrate it with the respective wireframes and prototype screenshots.

4.1.2. RESEARCH QUESTIONNAIRES

4.1.2.1. MOBILE MENTAL HEALTH APPLICATIONS QUESTIONNAIRE

After deciding on what design emotion tool to use, we approached the users with queries regarding their expectations about mental health applications, their contact with them and the features they would most value in them. We developed an online questionnaire (Appendix G) to which 91 participants answered.

We realized that people do not tend to find the common mood trackers in the market useful (Fig. 8), it was rarely in the top five for any of the query respondents. The questionnaire focused on understanding what features users of a mental health application felt were important or not. The features

presented to the user's were taken from an analysis of mood trackers and mental health applications currently in the market.

We also wanted to take into account the participants' knowledge of therapy, if they had ever been to therapy (Fig. 10), if they were currently in therapy (Fig. 9) and if so, how long they had been in therapy through their lives.

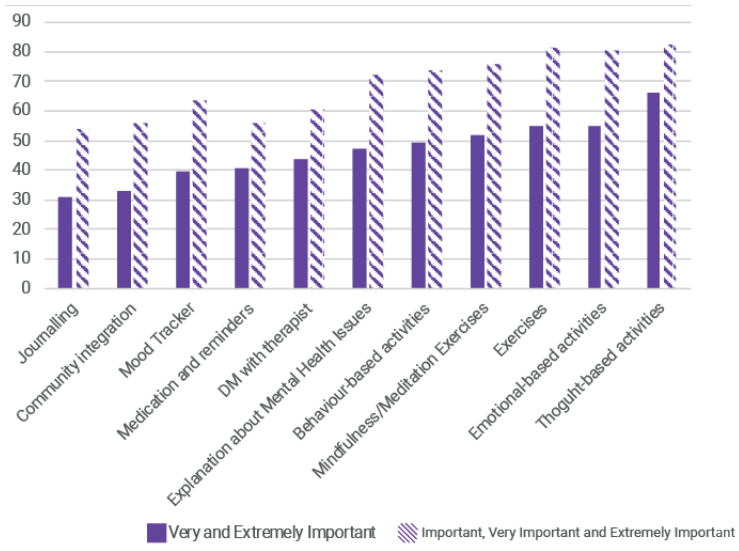


Fig. 8 - Analysis of people who have been to therapy according to if they placed each of the features in "Extremely Important and Very Important" categories and "Extremely Important, Very Important and Important", (Author, 2020)

Following the features questionnaire and its analysis, this information was used to define the architecture information (Fig. 23b), and thus beginning drawing wireframes both on paper and digital. After the digital wireframes, Figma was used to draw and build the prototype that was later one tested with users.

However, upon carrying out a permanova analysis with 'R'[4] software (Appendix I), it shows there is not statistically significance between two different groups. A second permanova analysis was carried out , taking into

[4] R is a free software environment for statistical computing and graphics. (https://www.r-project.org/)

account how many years of therapy each respondent had, and again the difference was not statistically significant.

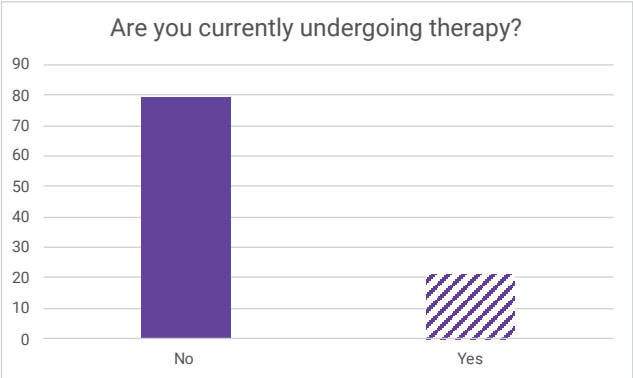


Fig. 9 - Analysis of people who were at the time of the questionnaire undergoing therapy. (Author, 2020)

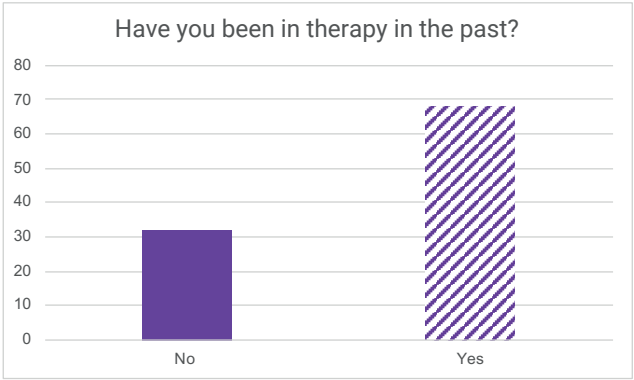


Fig. 10 - Analysis of people who have been in therapy in the past. (Author, 2020)

There were features that stood out, whether the respondents had experience with therapy or not, and those were the exercises: behavioural-based activities, thought-based activities, emotional-based activities and exercises prescribed by the therapists themselves (Fig. 8).

4.1.2.1.A. RESPONDENTS FAMILIARITY WITH MENTAL HEALTH AND THERAPY

The first segment of the questionnaire aimed to understand each respondents' familiarity both with therapy and mental health applications. The first four questions were directly related to therapy, figuring out how many of the respondents had experience with therapy, for how many days, months or years, if any, and if they were aware of what kind of therapy they had been participating in. The following questions aimed to discern how much, if at all, the respondents had interacted with mental health apps in the past, how many they had tried and which ones.

Section two was composed of simple affirmations which the participants had to rate for 1 to 6, one, being 'Completely Disagree' and six being 'Completely agree', there was a 0 option, in case the questions were, for instance, related to therapy and the person had never been to therapy, that was labelled as 'Non-Applicable'. The section was composed by 11 statements:

1. 'I feel like I only make progress during the therapy sessions.' (Fig. 11)
2. 'While I was in therapy I felt like I was doing important progress outside the therapy sessions.' (Fig. 12)
3. 'I have quickly stopped using all the mental health applications I have tried in the past.' (Fig.13)
4. 'I have tried using applications to help my progress in therapy.' (Fig. 14)
5. 'I have tried applications before/after I was in therapy and they were helpful.' (Fig. 15)
6. 'I have tried applications while I was undergoing therapy and they were helpful.' (Fig. 16)
7. 'I am more likely to use an application that is recommended by a therapist.' (Fig. 17)
8. 'I am more likely to use an application that is recommended by a friend.' (Fig. 18)
9. 'If I found an application that suited my needs I would be more likely to use it on a daily basis.' (Fig. 19)

10. ‘I would quickly lose interest in any type of mental health application.’ (Fig. 20)
11. ‘I am more likely to use an application the more features it has.’ (Fig. 21)

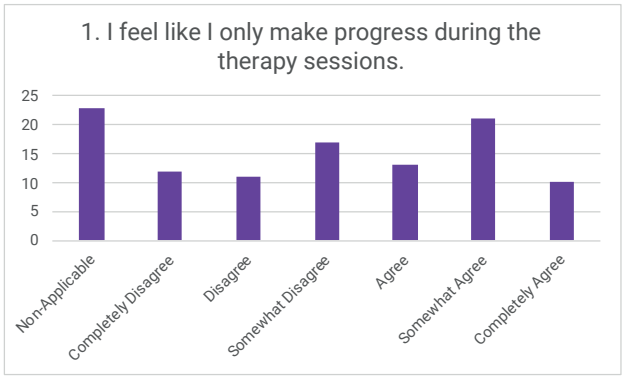


Fig. 11 - Number of participants who answered each category to sentence 1. (Author, 2020)

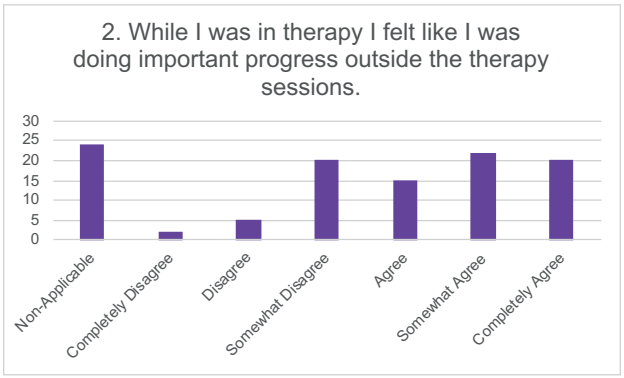


Fig.12 - Number of participants who answered each category to sentence 2. (Author, 2020)

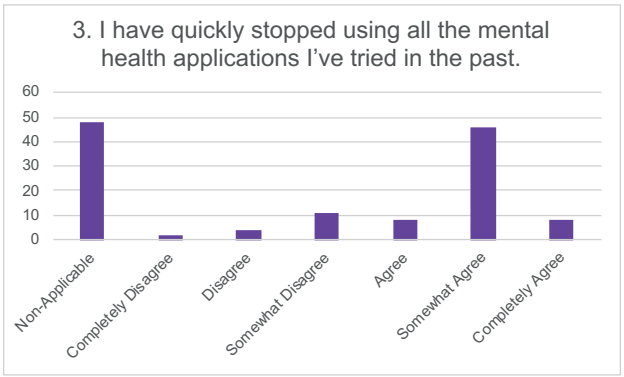


Fig. 13 - Number of participants who answered each category to sentence 3. (Author, 2020)

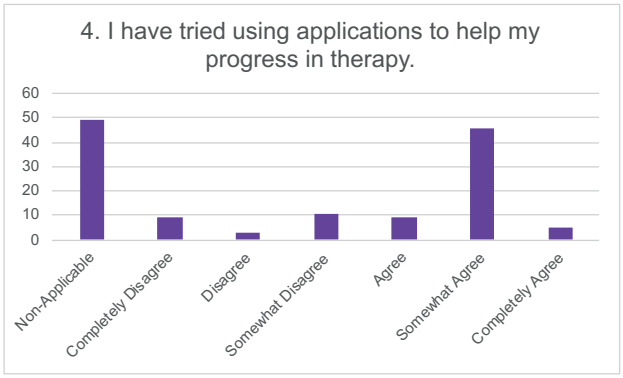


Fig. 14 - Number of participants who answered each category to sentence 4. (Author, 2020)

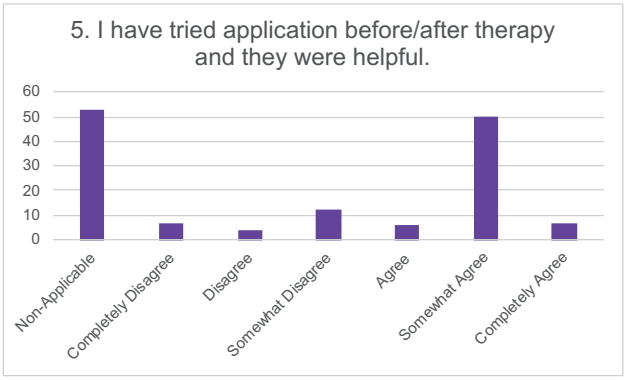


Fig. 15 - Number of participants who answered each category to sentence 5. (Author, 2020)

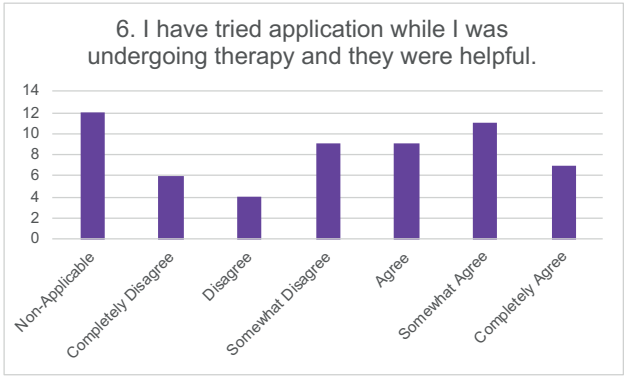


Fig. 16 - Number of participants who answered each category to sentence 6. (Author, 2020)

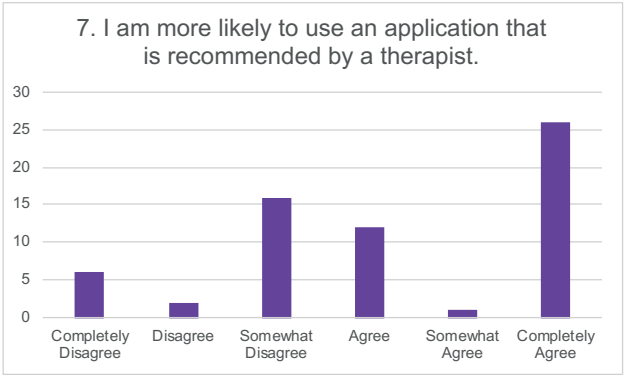


Fig. 17 - Number of participants who answered each category to sentence 7. (Author, 2020)

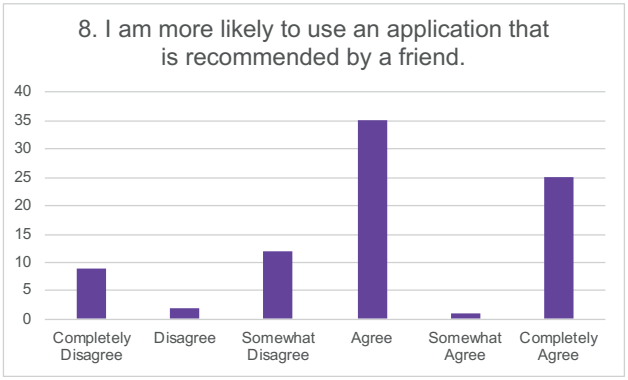


Fig. 18 - Number of participants who answered each category to sentence 8. (Author, 2020)

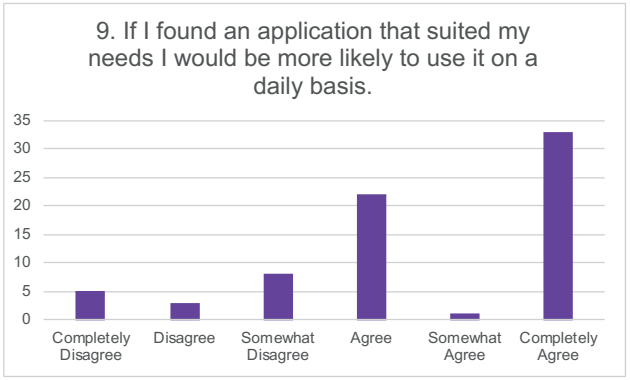


Fig. 19 - Number of participants who answered each category to sentence 9. (Author, 2020)

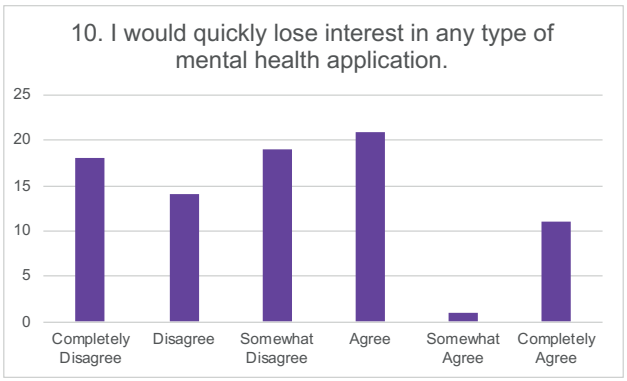


Fig. 20 - Number of participants who answered each category to sentence 10. (Author, 2020)

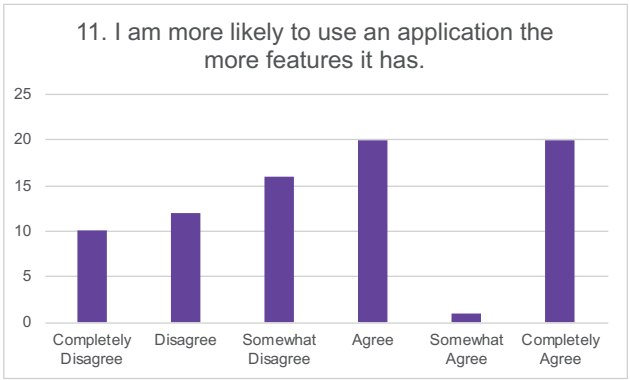


Fig. 21 - Number of participants who answered each category to sentence 11. (Author, 2020)

When asked how long they had been in therapy, the answers were varied. Out of the 91 participants, 34 (37,4%) had been in therapy for two and half years, followed by 9 (9,9%) who had been in therapy for a year and seven (7,7%) had been in therapy for two years and another seven (7,7%) participants had been in therapy for 3 months. The remaining participants (34) also had been in therapy from two weeks to ten years, but all the percentages were below 5%.

It was also important for us to understand if the participants were aware of what type of therapy they had frequented or not. As a multiple choice and multiple selection question (because patients may have frequented one or types of therapy), if the participants had answered yes to one of the questions that asked if they were currently or had been in therapy in the past, we asked those participants (64) what type of therapy they had attended. Most participants had attended 'Cognitive-behavioral therapy' (34,4%), followed by 'Psychoanalysis and/or psychodynamic therapy' (32,8%), subsequently this came 'Behavior therapy' and 'Humanistic therapy' (both with 10,9%). A quarter of the respondents were not sure about the types of therapy the had frequented and finally, 4,6% responded with 'Others'.

Lastly on the section of familiarity with mental health and therapy, we asked the participants if they had ever used a mobile mental health application, to which 60 (65,9%) people answered 'No' and 31 (34,1%) answered 'Yes'. To the participants that answered yes, we asked what applications they had used and if they were more than three we asked for the most helpful ones. Most people could not remember the name of the applications used, which we classified as 'Unspecified' (32,4%), followed by the application 'Calm' (14,7%) and Headspace (11,8%). All other applications mentioned[5] had a percentage below 6%. A significant amount of these applications were not specifically mental health applications but better classified has mindfulness and meditation applications.

[5] Sleepio, Moodpath, Betterhelp, Daylio, YourDost, Behavioural, Talkspace, The Pattern, Headspace, 7Cups, Sleeptown, Insight Timer, Waking Up, Wysa, Quit that - Habit Tracker, Brain fm and Health Unlocked

4.1.2.1.B. FEATURES

The questionnaire next segment was related to mood trackers app features and is explored more in-depth in the following section.

Regarding features, eleven taken from researching and analysis or mood tracker apps (Branco et. al, 2020), were given to the respondents. The respondents had to choose between “Not Important at all”, “Not very important”, “Somewhat important”, “Important”, “Very important” or “Extremely important”, for each feature. features were explained in the beginning of the features questionnaire page. The descriptions for each feature were as shown in table c.

Table c. Questionnaire features and respective descriptions. (Author, 2020).

FEATURES	DESCRIPTION
Mood Tracker	A way to track one’s mood through the day/week or any moment each person deems necessary.
Journaling	The act of writing thoughts/fears/further things the person would like to discuss in therapy (e.g. writing down your thoughts about something triggering that happened that day).
Direct Messaging	Would be an opportunity to message the therapist (however they would only answer if they deemed necessary).
Exercises	Whatever kind, but prescribed to the specific patient by their therapist
Emotional-based activities	Such as breathing exercises, anxiety relief exercises, etc.
Behavioural-based activities	Such as learning new hobbies, or having new hobbies suggested to the patient.
Thought-based activities	For example learning how to reframe negative thoughts.
Medication and reminders	Not only to take medication if needed but also to remind the user to interact with the application.

However, upon carrying out a permanova analysis with “R” software (Appendix I), it shows there is not statistically significance between two different groups. A second permanova analysis was carried out , taking into account how many years of therapy each respondent had, and again the difference was not statistically significant.

There were features that stood out, whether the respondents had experience with therapy or not, and those were the exercises: behavioural-based activities, thought-based activities, emotional-based activities and exercises prescribed by the therapists themselves.

4.1.2.1.C. DEMOGRAPHICS

Out of these 91 participants, 68 (74,7%) were female, 20 (22%) were male and three non binary people (3,3%).

Reviewing the data set, we realised that 3 minors had answered the questionnaire and since our lowest “Completed Education” option was Secondary education, they were forced to choose it, upon reviewing the data, this was changed in these 3 minors to “Basic Education”. In retrospect we should’ve allowed for an option lower than “Secondary Education” for a better data set, which will be taken into account in future research. With this taken into account, three (3,3%) out of the 91 had basic education, 14 (15,4%) had a completed secondary education or high school, the biggest slices are bachelor’s degree with 40 (44%) people and master’s degree with 32 (35,2%), lastly two (2,2%) people had a complete PhD.

4.2. INFORMATION ARCHITECTURE, WIREFRAMES AND PROTOTYPE

We then used the answers to the questionnaire (Appendix G) to define the main features and what the users would consider more important in such an application -- selecting the top 6 Features that user's found useful -- and adding the re-designed mood tracker (Fig. 22a; Fig 22b; Fig 22c).

Since a lot of the top features were exercise related, we choose to encompasse either within the journal (providing specific journaling exercises, that can enclose the emotional-based, thought-based and behavioural-based exercises) and breathing exercises. These features can all be seen in the information architecture (Fig. 23b).

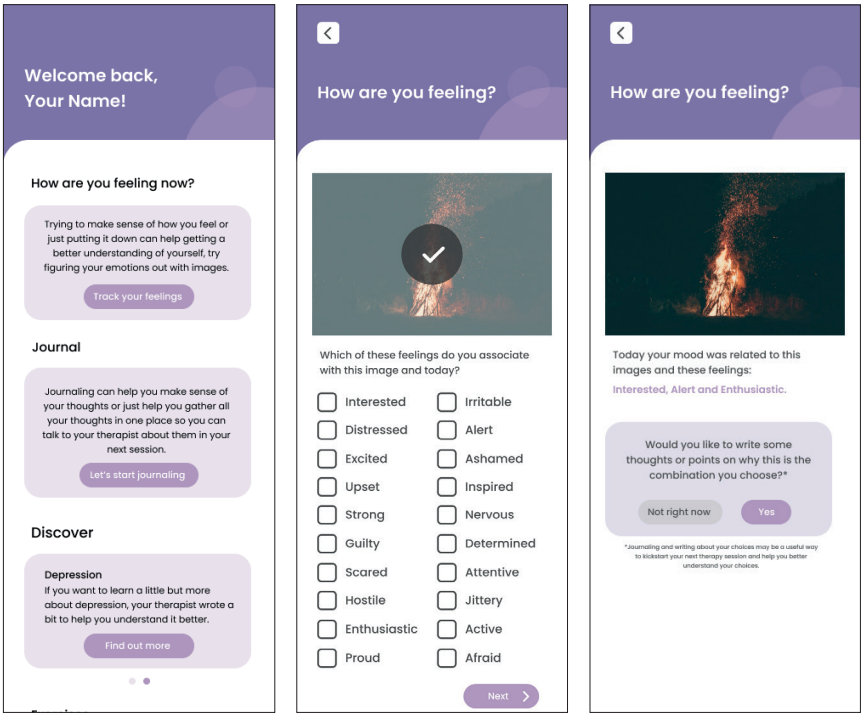
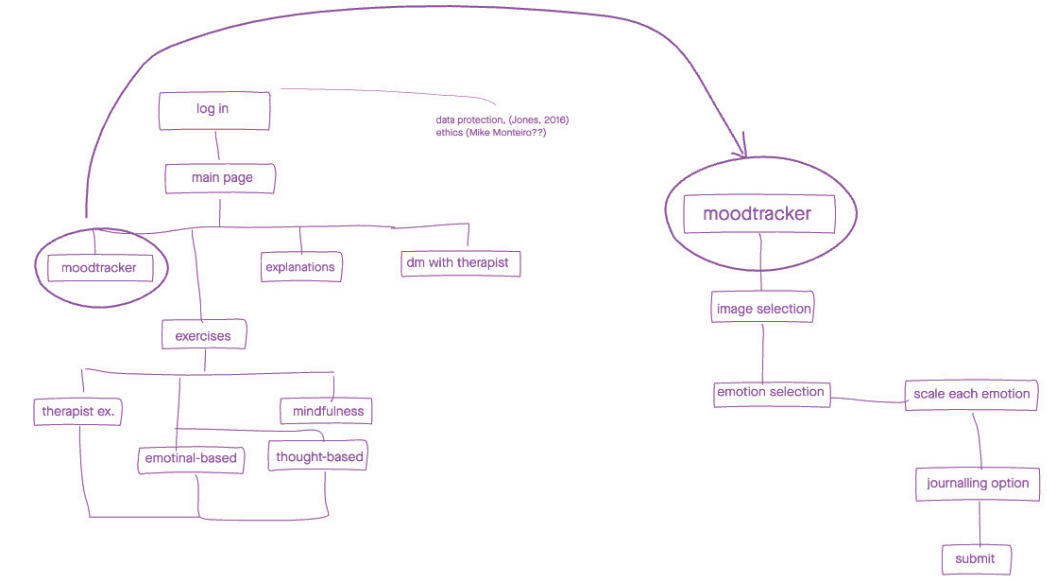


Fig. 22a - Blooming - main screen; Fig. 22b - Blooming mood tracker screen; Fig. 22c - Blooming - mood tracker (end screen), (Author, 2020).



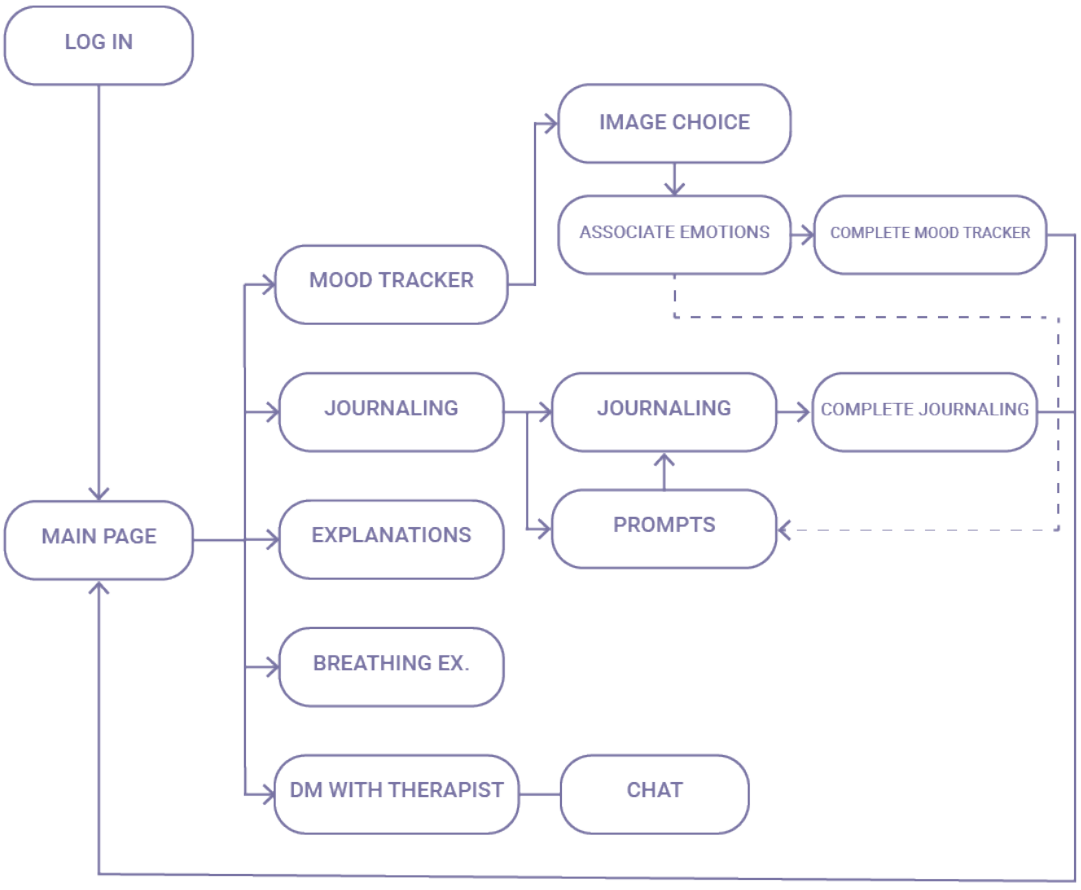


Fig. 23a - Information Architecture first draft; Fig. 23b - Information Architecture final, (Author, 2020)

4.2.1. NAME, LOGO AND COLOUR CHOICE

The name ‘Blooming’ and the color scheme of lavender tones were chosen based on the fact that lavender is a plant often associated with calm and a long history in herbal medicine (Bowman, 2016). As lavender is a plant that grows and blooms, that is where the name inspiration comes from, as one objective of therapy is for people to grow (or ‘bloom’). As for the circles in the logo (Fig. 24) they are meant to represent a safety bubble of the patient and the smaller bubble intersecting it, is meant to represent the therapist being let into the life of the patient.

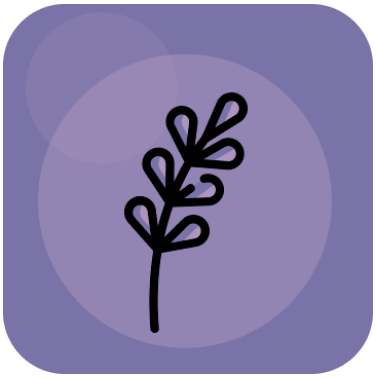


Fig. 24 - Blooming Icon, (Author, 2020).

The colour (Fig. 25a, Fig. 25b) lavender is often associated with healing, relaxation and cleanliness. “The lavender colour encourages calmness and tranquility of mind and is useful for both self-reflection and invoking a relaxed, meditative state” (Braan, 2020), as such making it one of the best colours to choose for an application that wants the patient to experience relaxation and feel calm while using it, while still working on self-improvment through therapy.

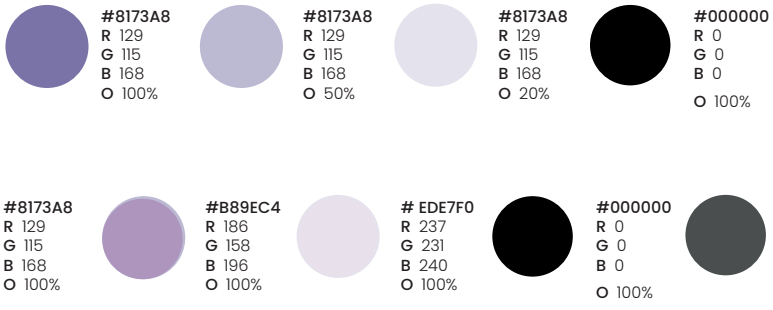
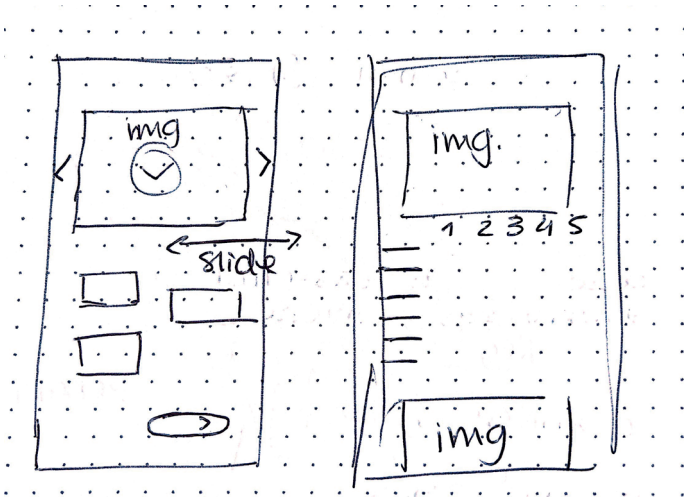


Fig. 25a, - Blooming Logo Colours, (Author, 2020); Fig. 25b. Blooming App Colours (Author, 2020).

4.2.2. WIREFRAMES

The first wireframes (all wireframes can be found in Appendix J), analog (Fig. 26a) and digital (Fig. 26b), were made still with the horizontal scroll, however figma does not allow horizontal scroll prototyping at the current time. But once the prototyping in Figma started, we had to opt for a vertical scroll for the images, but the user's did not seem to mind a long scroll through the images. After the usability tests, we did take into account the user's input, by changing the opacity from 60% to 40% in the 'selected image filter' so that the image is still visible after being selected. And we adjusted the text and font size in the screen where there was more text and it was not as legible.



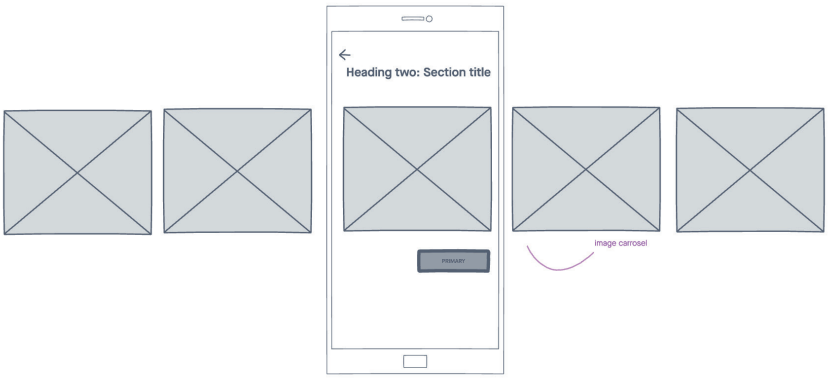


Fig. 26a - Blooming analog wireframes; Fig. 26b - Blooming first digital wireframes (Author, 2020);

We did our best to have a good visual complexity, by implementing high 'figure-ground contrast', avoiding clutter and edge congestion and keeping the application as symmetrical as possible. (Miniukovich and Angeli, 2014). This aims to make the design of the application as inclusive as possible. Holmes (2018) made a distinction between 'universal design,' which we are all used to listening to as a buzzword, and 'inclusive design.' The author starts by pointing out that universal design is rooted in the physical world, and describing the quality of final physical objects in design, defining it as 'the design of an environment so that it might be accessed and used in the widest possible range of situations without the need for adaptation' (Holmes apud Centre for Excellence in Universal Design, p.108) Inclusive design started out with digital technologies and has been growing alongside the internet. The second distinction she points out amongst the two is 'Universal design is one-size-fits-all. Inclusive design is one-size-fits-one' (p.51).

Talking about inclusivity is hard especially in times like these because, as Holmes (2018) says it is impossible to design something that is 100% inclusive. 'Inclusive design is about engaging with people that can be completely different than you' (Holmes, 2018, p.51).
Holmes (2018) and Monteiro (2019) share the same opinion about how inclusion for each element is granted by the success of other elements. This means that having a diverse team of designers and developers from diverse backgrounds, more likely makes the project more inclusive, in this case, a diverse team of supervisor's with different backgrounds and user's with different perspectives on what they want to take from an application like this.

Monteiro (2019) and Holmes (2018) both agree that to be able to move towards a more inclusive design approach, the first step is for the teams that create these designs to be diverse themselves. Holmes, also points out that most designers are currently unaware that their bodies will change with age, and that that change will eventually create a mismatch between what they are currently creating and how they intended it to be used in the first place. Design biases are everywhere; however, we as designers need to become increasingly more mindful of these biases, so

that our designs can work for a broader number of people. ‘We are all born and gain abilities as we grow. We lose those abilities as we age. As we move through life, our abilities change as a result of illness or injury’ (Holmes, 2018, p.95).

4.3. USABILITY TESTS

4.3.1. METHOD

Through the design process the question of which to use, vertical or horizontal scrolling arose. Since the mood tracker in the application requires the user to scroll through a considerable amount of images (insert number of images), specially in such a small devices, we opted to do the vertical version of the scroll, because in prototyping there was no easy way to do a seamless horizontal scroll, however, the usability tests would tell us if the vertical scrolling is working or not.

Regarding usability testing, a protocol was established in order to understand if the users had trouble navigating the basic everyday tasks of the application. This protocol consisted of four tasks:

Tasks #1 - Mood Tracker
Open the Mood Tracker
Scroll through the images and select image #1
Select the following emotions:
Interested
Alert
Enthusiastic
When asked if you want to advance to journaling, say “Not right now.”

Task #2 - Journaling
Open the journal
Select the “Questions for challenging thoughts”in the drop down menu
Answer (with a simple click) questions 5, then 6 and finally 8.
Finish using the journal.
Return to the home screen.

Task #3 - Breathing Exercise
Do a “Relax Breathing exercise”

Task #4 - Message the therapist
Open the chat
Send a voice message to the therapist.

Task number one (Fig. 22a, Fig. 22b, Fig. 22c) was the general use of mood tracker, selecting the image and selecting emotions associated with the image. This task only tested the usability of the mood tracker and not the possible influence the mood tracker would have on patients in therapy. Due to the current pandemic it is more difficult to contact both the therapist and have a face to face interaction with the patients to test the mood tracker before an appointment. The mood tracker also cannot be properly tested as it is currently just a Figma prototype, meaning it cannot save the user’s input and it can only be used through the Figma Mirror mobile application, and with Figma prototyped and opened in a computer to connect to it. These were the main reasons for a simple usability test and not a full prototype test during a certain period of time.

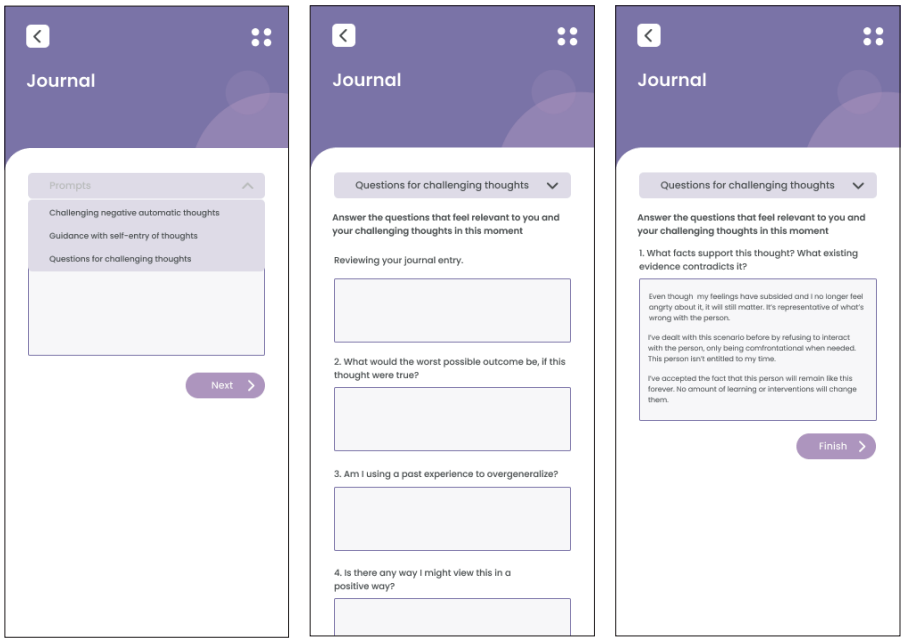


Fig. 27a - Blooming journal screen - prompts; Fig. 27b - Blooming journal screen; Fig. 27c - Blooming journal final screen, (Author, 2020);

Task number two (Fig. 27a, Fig. 27b, Fig. 27c), aimed to see if the user could use the more diverse features in the journal. This means, instead of just writing down, using CBT (Cognitive-Behaviour Therapy) and therapist suggested exercises that help the journaling process. This feature was called 'Questions for challenging thoughts', which is an exercise composed of 13 questions about a specific troubling thought the patients may have and the patients can answer whichever questions they deem necessary of that they can answer at the time about that particular thought, this is a common CBT exercise to aid in journaling.

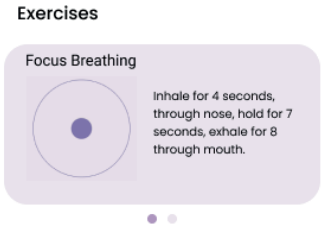


Fig. 28 - Blooming - close up of exercises in main screen (Author, 2020);

Task number three (Fig. 28) simply tried to understand if the users of the application could figure out that they had to swipe in between the different types of breathing exercises and figure out that these had different names for different occasions.

Task number four (Fig. 29) was used to test the user's ability to find the chat and to show that for a bigger inclusivity, a possibility of voice messages was added to the application.

Subsequently, participants were asked to fill out a system usability test questionnaire (Appendix H), which consisted of 10 questions related to their experience whilst doing the previously mentioned tasks.

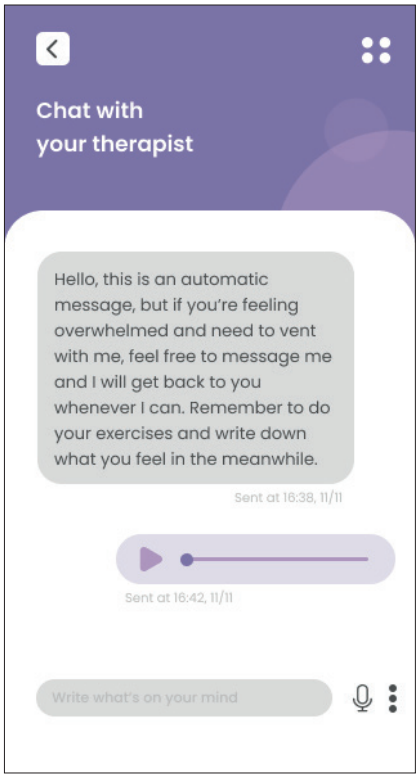


Fig. 29 - Blooming chat screen (Author, 2020);

4.3.2. PARTICIPANTS

The users were between the ages of 23 and 29 and the only requirement was that they were currently or had in the past been in therapy. There were three men and three women, half of the users have a master's degree (n=3) and one has a bachelor's degree and two have a high school diploma. The users study or work all in different fields, these being: architecture, veterinary medicine, engineering, management, sports physiology and computer science. Only one of them is not currently in therapy. The years the users have been in therapy were also diverse, (n=2) had been in therapy for one to two years and another (n=2) had been in therapy for two to four years. One user has been in therapy for over six years and another for under a year. The users completed each of the tasks, when possible the screen was filmed and the method of 'think aloud' was implemented while they were using the application and completing the different tasks.

4.3.3. RESULTS

It was avoided answering questions directly related to the tasks and there was intervention only when the prototype or the figma mirror application had some kind of trouble (i.e. refreshing screens or the application crashing in the user's phone, etc.).

All the users successfully completed the four tasks and the only problems that occurred were directly related to the figma mirror application, or the user's expectations towards the prototype (i.e. more than half of the users (n=4) tried to send an actual voice message, not realising they were using a prototype, this means that they tried to click and hold the microphone icon, which is not a feature that figma prototyping allows at current time). Some user's did point out more difficulties related to the UI aspect of the application, these being the watermark in the selected image being too strong (n=1), the small font size in some screens (n=2), a single user also thought the breathing exercise animation was a button, because of its circular shape and tried to click it and was confused at the lack of feedback, and only then understood the animation was an complement to the breathing exercise. Half the users (n=3) also, had initial doubts about the 'Track your feelings', since the task said 'use the mood tracker' and they were unsure at first if that was the mood tracker, but after scrolling through the options quickly realised that was the only possible option.

Following the usability tests and the user's input, we paid more attention to font size and made it readable in every screen, especially taking into account the screens that had bigger amounts of text, such as the journaling screen. We also made the watermark less prominent so that user's could still observe the image after it was selected.

Calculating the score for the SUS (system usability score) is a little complex, we have to take the 10 template questions (adapted to our system, in this case, the application) and turn the answers (strongly disagree, disagree, undecided, agree and strongly agree) into numbers from one to five. For each odd numbered question we subtract 1 from the score and for each even numbered question we subtract their value from five. Following this, we take

these new values and add them together for a total score and finally we multiply this score by 2.5. This is so we can have a score that is out of 100, so it is easier to interpret the results. However these results are not a percentage.

The lowest score in the SUS was a 67,5 out of 100 (Fig. 30), by the user number three, which during the thinking aloud method pointed out the text being too small to read in one of the screens and the image watermark being too strong, both of these usability problems were fixed for the final version of the master's final project. The highest score was 97.5 out of 100, this user had the most difficulties in the interpretation of the written tasks, but when the user understood, everything went smoothly. User number four also had trouble with the interpretation of the tasks, but pointed out that the more they used the application the easier it got.

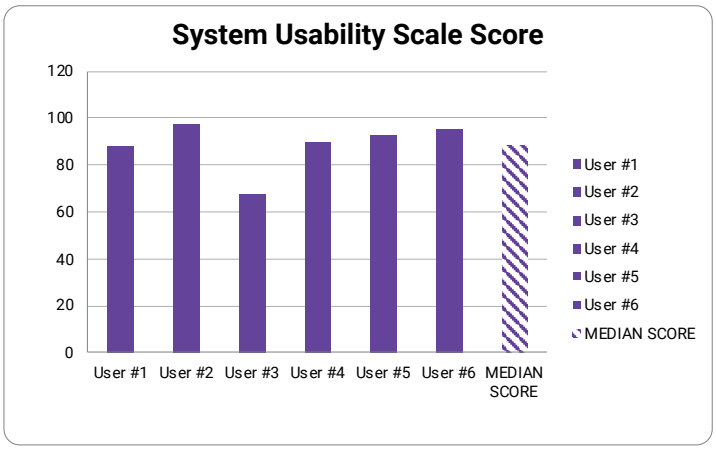


Fig. 30 - System Usability Scale Score (Author, 2020);

Because the SUS uses a positive/negative sentence structure, for a better understanding of the results in some graphics, we inverted the scores on the negative sentences, meaning that on the negative sentences (even numbered ones), 'Completely Disagree' was valued as five and 'Completely Agree' was valued as a one, for the following graphics.

In the following graphic (Fig. 31) we can see that the biggest discrepancy between male and female users is on the sentence 'I think that I would like to use Blooming frequently', this can be related to sex or also the fact that the male user's were from more 'scientific' areas, such as engeneering and computer science, and through the development of this project there was a clear distancing between more scientific areas and the use of the image mood tracker.

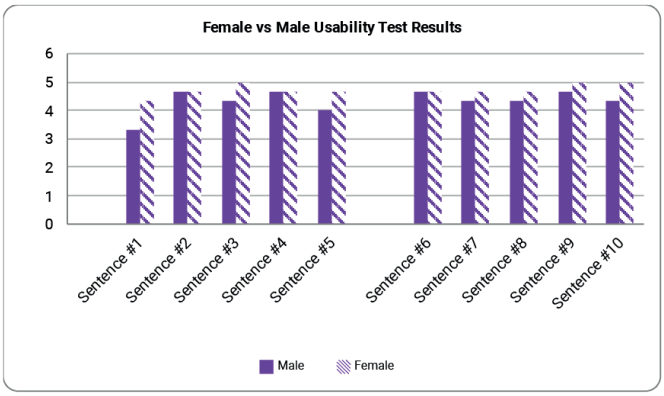


Fig. 31 - System Usability Scale Score per Sentence (Male vs. Female) (Author, 2020);

Because of the limited number of users, we were able to approach the users that had given a less favourable score in some of the SUS sentences and try to understand why they gave this score. Three of the users answered they would be undecided about using the application frequently, of the users we approached to try and understand why, said she did not identify with the applications beyond the exercises prescribed, and that she had never contacted her therapist and would rather only talk to them face to face. User number one, who also chose 'Undecided', explained that unless the application was strongly recommended by the therapist that he is very resistant to install unnecessary applications on his mobile phone, and that's why he chose 'Undecided'.

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CHAPTER 5 – CONCLUSIONS

5. CONCLUSIONS

The questions first proposed inquired about how interaction design could bring improvement for the context of clinical therapy and if interaction design could help the patients progress in between therapy sessions. The final prototype addresses both of these questions, specially through the exercises that can be prescribed by the therapist of the patient can just do out of free will, and the diverse journaling options, but also address the improvement in the context of therapy, with the mood tracker that is designed to help kick start conversations between patients who have a harder time starting to talk or do not exactly know what issues to address and this gives the therapist a toll to help them reach the deeper issues they may want to address.

The usability tests had a 100% completion rate for all the tasks and the few commentaries and doubts that arose were due to prototyping issues (i.e. prototype not working exactly how users would expect it to through their daily use of similar functions, as the keyboard not popping up and the user not actually having to type to answer the questions) or were related to how the tasks were written. Overall the SUS score also shows that out of the 6 users, a significant amount were very satisfied with the application.

The objective of developing an interactive system with a therapeutic base and guidelines provided by a therapist was accomplished.

The first research question was ‘how can interaction design merge with clinical psychology in a way that will make the patient progress in therapy and not happen exclusively during the therapy sessions?’. The final project is a direct answer to this question as the interactive platform was created in order for this to happen, whilst still under the supervision of the therapist and with his provided guidelines.

The second research question was ‘how can interaction design make the work done in between therapy sessions something fruitful for the context of therapy?’. This questions is answered by the features we choose to implement in the application as well as the fact that the therapist gets full control into what goes into each patient journal and information screen, this aims to protect the patients from getting more information than they can process (i.e., the therapist’s own definition of depression (a common psychological condition) is put into the application in his own words).

The journaling tasks (also provided to each patient individually by the therapist) and mood tracker features aimd to motivate the patient and help kickstart conversations about what happened in between the therapy sessions for the following appointment.

Finally, we would like to reinforce the importance that the co-design process with a clinical therapist had in this project. Clear guidelines for what would be useful or harmful for the patients were established. The lack of guidelines for any type of medical related applications should be a larger concern in our current society.

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APPENDIX A

INTERVIEW WITH DR. DIOGO MONTE-MÓR

INTERVIEW WITH DR. DIOGO MONTE-MÓR
HUMANIST PSYCHOTHERAPIST

Author: Queria que começasse por dizer-me um bocadinho o seu background de Psicologia. Eu sei que é humanista, é de uma vertente mais humanística…
Dr. Diogo Monte-Mór: Sim, sim.
A: Queria que me explicasse um bocadinho o que é que isso é?
Dr.: Está bem.
A: E um bocadinho, o seu background, mesmo, de estudos.
Dr.: Acho que se calhar começo pelo background, sim. Eu me formei no Brasil. Eu me formei em 2008 em Psicologia Clínica. Depois fiz o mestrado cá em Lisboa, na Universidade Autónoma. Um mestrado em Relação de Ajuda e Relações Terapêuticas. Voltei para o Brasil e fiz lá a minha formação em Psicoterapia Humanista.
A: Ok.
Dr.: Pronto, é por ai. Agora a respeito do que é a psicoterapia humanista… Ela é uma linha um pouco mais ampla da psicologia, que se fundamenta nos princípios humanistas da filosofia. É do, às vezes meio grosseiramente colocado, como "o homem essencialmente bom", mas, de uma maneira mais correta, seria do "homem como essencialmente positivo, principalmente para si mesmo". Como uma linha de trabalho, como uma linha da psicologia que se baseia nos princípios colocados pelo Carl Rogers, nos Estados Unidos, que desenvolveu aquilo a que, de uma maneira ampla, é chamado da psicologia humanista, mas que começa com a psicoterapia centrada no cliente e depois se torna a abordagem centrada na pessoa. É uma linha - é uma perspetiva, mais que uma linha de trabalho - é uma perspetiva, de que todas as pessoas têm - assim como toda a vida - mas todas as pessoas têm uma tendência inata ao próprio desenvolvimento, ao próprio desenvolvimento máximo das suas potencialidades. O terapeuta humanista ou o psicólogo humanista trabalha de forma a facilitar essa tendência, a que o Rogers chama de "tendência atualizante".
A: Ok.
Dr.: Ele parte de um estudo empírico no começo do século XX onde ele percebe através da análise de vários psicólogos diferentes em atendimento, de várias

linhas diferentes, que todos tem alguns pontos em comum. Ele parte dali, através da análise dos atendimentos bem sucedidos e dos atendimentos mau sucedidos, da perspetiva tanto do cliente como do psicólogo… Ele busca analisar, então, o que é que torna um atendimento bem-sucedido. E ele descobre alguns pontos. O principal dele sendo uma relação empática: quando o psicólogo se sente capaz de se colocar como se fosse a outra pessoa, para perceber melhor essa perspetiva dela e essa pessoa se sente compreendida nessa perspetiva, é o que ele entende como uma relação empática. Para além disso, ele coloca dois outros pontos principais, o que ele chama de congruência, que é, essencialmente, o psicólogo tem que estar confortável em ser quem ele é. No caso do psicólogo ou das pessoas, de uma maneira geral, que ele define como congruência, é quando você se sente bem sendo quem você realmente é.

A: Sim. A Cláudia Castro falou-me um bocadinho desse aspeto, sim.

Dr.: E outro ponto que ele coloca é o que ele chama de consideração positiva incondicional, que da perspetiva do psicólogo, é um absoluto não julgamento daquilo que é trazido pelo cliente. Tudo o que é apresentado como experiência dele é válido como experiência dele. Isso são os que eu chamaria de os pontos principais.

A: Sim, estou a perceber. Pronto, eu sou aluna de um mestrado de Designer Gráfico e de Interação e o que nós fazemos no mestrado é muito design centrado no utilizador.

Sim.

A: E eu estou à procura ainda de algo para o meu projeto final de mestrado.Eu sei que queria que fosse algo relacionado com psicologia. Eu já tive uma ideia anteriormente, mas foi descartada por ser demasiado complexa, que era pegar em body-focused repetitive behaviours. Não sei se tem alguma experiência com isso?

Dr.:Não tenho.

A: Que é uma doença no espectro do OCD. Isso foi descartado, então eu agora estava à procura, na verdade, de um problema que eu pudesse solucionar com a interação. E uma das minhas ideias – que eu queria discutir com psicólogos e saber se realmente fazia sentido ou não – era tentar criar uma ferramenta de apoio que ajudasse tanto nas consultas ou em preparação para as consultas, como entre consultas. Porque o que eu sinto dos meus amigos, que têm consultas de psicologia é que têm a consulta e têm o espaço entre consultas…

Dr.: Sim.

A: O espaço entre consultas é mais difícil de navegar, especialmente no início

da terapia e eu queria um bocadinho perceber se achava que havia falta de uma plataforma, de uma ferramenta que ajudasse de alguma maneira as pessoas a navegar nesse espaço entre consultas?

Dr.: Exato, isso é interessante. A gente fala muito na formação de treinamento do que é o espaço entre consultas. Qual é a importância, o valor do espaço entre consultas? A ideia da consulta, a ideia do processo de terapia: a consulta é uma parte do processo de terapia.

A: Exato, sim.

Dr.: Mas não é o único, ou não é só o que compõe… Eu tive um supervisor no Brasil, que dizia que a partir do momento em que o cliente entra em contato com o psicólogo já começou a terapia. No primeiro segundo, da primeira chamada que ele fez, para tentar marcar uma consulta, já começou a terapia, porque é um processo interno. Facilitado pelo psicólogo muitas vezes, mas é um processo interno. Uma ferramenta para um espaço entre consultas…

A: Porque, uma ferramenta para um espaço entre consultas - isto de uma perspetiva completamente pessoal, eu também ando na terapia, é cognitivo-comportamental – mas eu sinto que desenvolvo bastante algumas coisas nas consultas, mas sinto que não tenho tanta capacidade sozinha ou lidar com ou refletir ou continuar a fazer algum progresso. Sinto que tenho progresso naquele espaço de consulta e que depois é mais difícil encontrar um espaço ou um sítio ou uma ferramenta para continuar o progresso fora da consulta, para me dar mais alguma autonomia. É um bocadinho nessa perspetiva.

Dr.: Pegando pela linha que você faz, nós temos… São perspetivas bem…

A: Eu sei.

Dr.: Bem distintas. Um dos princípios fundamentais do trabalho do humanista é algo que se chama a não diretividade, que é: eu não digo ao meu cliente daquilo que nós devemos falar, daquilo que eu acho que é importante falar. Nós trabalhamos com aquilo que o cliente traz, é o cliente que conduz a sessão, nesse sentido, por exemplo, eu não passo tarefas.

A: Sim, trabalhos de casa.

Trabalhos, nada desse tipo. Mas quando surge esse ponto, o que eu às vezes recomendo às pessoas é a escrita. É fazer diários, journals, fazer coisas como uma ferramenta de fazer apontamentos das ideias…

A: Sim, exato, mas isto no geral. Agora, um dos temas em que eu estava a pensar pegar, para fazer focado para estas pessoas, é por exemplo pessoas com Transtorno de Ansiedade Generalizada. Para essas pessoas, tem algum método

diferente ou mantem-se tudo igual?

Dr.:Aí é que está um ponto… A psicologia humanista parte desse pressuposto das três condições facilitadoras, que basicamente quer dizer o seguinte: juntando essas três condições com essa tendência atualizante, não importa qual seja a questão da pessoa – a forma de trabalhar é a mesma. Toda a ideia de tarefas ou estratégias diferentes conforme a condição da pessoa passa muito mais por uma perspetiva do comportamento do que dessa ciência.

A: Ok, estou a perceber, então se calhar não faria sentido uma ferramenta deste género para terapia humanista?

Dr.: Não, eu acho que não faria sentido uma ferramenta que fosse focada, digamos no diagnóstico, no problema.

A: Sim, sim… Então não numa coisa especifica.

Dr.: Não numa coisa especifica. Ferramenta que eu entendo, que eu percebo que poderia ser útil é num sentido um pouco mais amplo. Agumas questões assim que eu penso no espaço entre consultas, principalmente se o espaço é maior, se não é só uma semana, se as consultas se dão em duas ou mais semanas… Eu fico pensando num sentido muito prático. Uma ideia que poderia ser interessante, para mim, seria se houvesse, por exemplo, uma espécie de caderno de anotações de ideias partilhado.

A: Entre o terapeuta…?

Dr.: Entre o terapeuta e o cliente.

A: Eu queria um pouco fazer isso, mas eu queria mais do que a função. O que existe bastante no mercado é que existem aplicações para fazer mood tracking, para ver como a pessoa evolui, como está, se está melhor, os picos, porquê. Tentar associar emoções a esses picos ou atividades a esses picos. Esse tipo de coisa já existe, mas é raro existir alguma coisa que seja partilhada com o terapeuta e eu queria essa partilha. Queria essa partilha não só dentro dessas consultas, mas que o terapeuta também pudesse ter acesso ao que se está a passar na cabeça do paciente, digamos, fora das consultas, se ele próprio tivesse tempo ou disponibilidade para isso.

Dr.: Sim, porque eu fui buscar isso, porque eu me lembrei de uma coisa que é uma psicóloga americana que escreveu que uma das maiores questões para uma pessoa com depressão, principalmente com depressão e pensamentos suicidas é o isolamento. E que ela passou a adotar uma estratégia de, entre as consultas, manter um contato com o cliente.

A: Sim, era um pouco nessa perspetiva.

Dr.: E que muitas vezes, para a pessoa não se sentir absolutamente isolada, ter uma ferramenta própria que pudesse garantir - talvez um pouco mais de segurança do que um WhatsApp ou uma coisa assim - mas que pudesse ser um espaço para a partilha de ideias, não necessariamente para bate-papo.

A: Não necessariamente. O que eu queria… O que já acontece com muitos psicólogos é: "Tens aqui o meu WhatsApp, o meu número de telemóvel, se tiveres algum problema mais grave liga." O que eu queria não era necessariamente isso, era mais criar um espaço, exatamente, em que a pessoa pudesse ir escrevendo o que sentia: picos ou não picos, ou dias melhores também e isso pudesse ser partilhado com o terapeuta.

Dr.: Talvez se fizesse, não seria… Eu estou a tentar guardar isso um pouco mais pelo lado da psicologia clínica e menos pelo lado da psicoterapia humanista. Você fala de um mood tracker?

A: Sim.

Dr.: Há alguma coisa que pudesse de alguma forma assim… Eu vou juntar uma ideia de uma coisa que me deram hoje. Eu vi hoje uma cliente que em casa eles têm um quadro onde registam entre eles como é que tem corrido a semana, como é que eles se têm sentido, de uma maneira física com um gráfico. Alguma coisa que a pessoa pudesse marcar…

Mas acha que isso é importante?

Dr.: Eu acho que isso pode acrescentar. Pode ajudar num processo, estou pensando por um lado de não só isso…

A: Eu queria que a ferramenta que eu criasse ou que a plataforma que eu criasse fosse um espaço com diferenças ferramentas possíveis. Se calhar também um espaço de aprendizagem, não sei se isso faz sentido, mas também já existem algumas aplicações que explicam o que é que é a ansiedade? "Porque é que te sentes assim?" Ou o que é que a depressão, porque é que a pessoa se sente assim? Quais são os sinais?

Dr.: Eu acho que isso pode ser interessante. A ressalva que eu faço em relação à informação, é um pouco, é a mesma coisa que os médicos falam…

A: Se calhar devia vir só do terapeuta, essa informação?

Talvez.

A: Pronto, eu isso acho que concordo um bocadinho. Para não haver aquele self-diagnosis.

Dr.:É, mas um espaço que pudesse ser um espaço, um lugar de partilha muito mais do cliente para o terapeuta, para o psicólogo, em que o psicólogo pudesse,

eventualmente, fazer uma colaboração…

A: Dar um feedback.

Dr.: Dar um feedback, dar uma olhada nisso ou como essa psicóloga americana que fazia um apontamento…

A: Qual é que é o nome dela?

Dr.: Ah, eu já vi, mas agora… Foi um artigo que eu li no Psychology Today, mas já tem mais tempo. Eu sou péssimo com os nomes nesses casos, mas ela dizia que a estratégia que previa ser mais eficaz para prevenir o suicídio era simplesmente mandar uma mensagem, mandar um email.

A: Manter o contacto.

Dr.: Sim, manter o contato. Mostrar à pessoa que alguém queria saber.

A: Sim, que às vezes aquilo era suficiente. Então, uma ferramenta que pudesse juntar isso com uma espécie de um mood tracking, mas de uma forma que, no meu entendimento, pelo menos não fosse só quantitativa, mas que a pessoa pudesse dar descrições. Em vez de só dizer "hoje estou bem" ou "hoje estou mal", em que pudesse fazer um apontamento do género "hoje estou bem porque se passou isso, isso e isso. Com isso me senti assim ou me senti assado" ou então "tive essas ideias". Até mesmo uma coisa que alguns clientes apontam como "na semana inteira eu pensei em coisas para trazer para terapia e hoje já não me lembro de mais nada!". Se calhar uma plataforma onde a pessoa pudesse dizer: "olha, na próxima sessão quero falar disso, quero falar daquilo, quero falar de tal" e ter aquilo registado, de uma maneira partilhada que a pessoa… Ou seja, nessa aproximação pudesse ser logo partilhado com o terapeuta, para ele também ter ideia. Ok, mais questões… A da aprendizagem eu percebo que não seja, necessariamente. A terapia humanista não funciona todo como exercícios, mas imaginar ter pessoas com depressão, que às vezes têm ataques de pânico ou ataques de ansiedade. Ter alguma feramente para lidar com isso, acha que seria importante ou não tanto?

Dr.: Num ataque de pânico... Exercícios de respiração, coisas básicas.

Isso pode ser interessante, poder colocar algumas informações. O fornecer a priori informação - a ferramenta oferecer informação - a única ressalva que eu faço em relação a isso é que algumas linhas buscam informação num sitio, outras linhas buscam informação noutro sitio.

A: Eu teria de escolher uma linha da psicologia para fazer isso?

Dr.: Pois, e ter um espaço em que o profissional pudesse oferecer essa informação. Que eu pudesse colocar alguns apontamentos meus sobre o que é a depressão, do que é ansiedade, como lidar com uma crise de pânico ou qualquer coisa assim…

A:Ok, isso faz muito sentido.

Dr.: Isso sim, eu acho que poderia ser útil. Porque, eu entendo que são duas formas de trabalho. Eu aqui no consultório sou mais terapeuta, mas eu também trabalho com um psicólogo clínico, aonde eu tenho uma postura que segue o mesmo princípio na sua essência, mas onde eu, às vezes passo uma tarefa, às vezes passo uma informação.

A:E onde é que este tipo de plataforma seria melhor, enquanto psicólogo clínico ou enquanto terapeuta?

Dr.: A parte da informação é o que eu usaria mais na clínica, no trabalho clínico. Como terapeuta o que seria mais útil, mesmo para mim, seria como que um diário virtual… Mas me ocorre agora um feed aqui, que talvez pudesse ser interessante que é: a pessoa ter a opção de partilhar aquilo com o psicólogo ou manter só para ela, só como um registo.

A:Ok, nem tudo ser partilhado?

Dr.: É isso. A pessoa poder escolher. Não ser automaticamente partilhado. "Eu quero que o Diogo veja isso, eu quero que o Diogo veja aquilo. Fiz um desenho, escaneei e quero mostrar para o Diogo". Qualquer coisa assim.

Ok, e por exemplo, imaginando que eu… O meu objetivo é fazer/criar esta plataforma durante o período da minha tese de mestrado e eu teria de eventualmente testar isto com pessoas. Estaria aberto ou acha que clientes seus estariam abertos a ser um bocado "cobaias" de testar para ver como funciona? Ou acha que isso já é demasiado? Estou a perguntar isto mesmo numa perspetiva porque, eu a partir do momento em que eu criar um protótipo vou ter que testar este protótipo.

Eu não posso efetivamente responder pelos meus clientes, mas havendo… A única coisa questão ai, para mim, é a questão do sigilo.

A:Sim, claro.

Dr.: A partir do momento em que tudo o que acontece aqui…

A: Eu percebo, mas a maneira como eu viria os testes seria uma coisa do género: a aplicação nunca vai estar 100% funcional a menos que eu arranje alguém para a implementar.

Dr.: Claro.

A:Eu teria só uma versão disponível e eu poderia esperar lá fora, não interessa, e eu teria se calhar só um questionário com tarefas a cumprir e com o grau de dificuldade. Seria algo mais desse género, duma perspetiva muito "eu tive dificuldade a fazer isto". A pessoa não necessita necessariamente de partilhar informação nenhuma. Seria mais nessa perspetiva.

Dr.: Eu certamente estaria aberto a oferecer isso às pessoas. Perguntar se elas estariam abertas a participar nisso. Eu suponho que pelo menos uma ou duas poderiam estar.

A:Ok.

Dr.: Eu não posso realmente garantir…

A:Sim, sim, eu percebo. Seria só mais uma questão se achava que havia alguém que não se importasse.

Dr.: Eu acho que sim. Algumas pessoas poderiam alinhar.

A: Ok, este projeto vai ser desenvolvido ao longo do próximo ano em princípio.

Dr.: Pode ser que no final do ano que vem, eu esteja com pessoas completamente diferentes.

A:Exato.

Dr.: Também há possibilidade, mas em princípio eu estou aberto pelo menos a perguntar às pessoas.

A: Ok e estaria aberto a comunicar mais comigo, se eu tivesse mais ideias, se eu quisesse mostrar um bocadinho como é que está a correr e as coisas que eu estou a desenhar… Estaria aberto a isso?

Dr.: Sim, claro, claro. Eu tenho há algum tempo essas ideias pretensiosas… Eu não percebo nada de informática. Quer dizer, eu não percebo nada, eu não percebo muito de informática. Mas tenho sempre buscado uma ferramenta para psicólogos. Nesse caso a sua proposta é um pouco diferente, a sua ferramenta pelo que estou a perceber é mais para o cliente, para o paciente, do que necessariamente para o psicólogo.

A:Sim, exato, mas eu estou aberta a ideias ainda porque isto não está definido.

Dr.: Porque o que eu sinto falta, como profissional, é uma ferramenta um pouco mais prática para prontuários, porque ainda não encontrei nenhuma.

A:Prontuários, como assim?

Dr.: Prontuário é, eu na verdade, já nem uso essa palavra há imenso tempo… Mas para os meus apontamentos de sessão, para fazer agendamento, para fazer a gestão do consultório. Eu ainda não encontrei uma ferramenta.

Exato, isso normalmente já existe, mas são feitas para… Médicos.

A: Sim, para clínicas especificas. Vou parar de gravar.

APPENDIX B

INTERVIEW WITH DR. DEGEL ÖZKARAMANLI, PHD

INTERVIEW WITH DR. DEGER ÖZKARAMANLI
ASSISTANT PROFESSOR AT UNIVERSITY OF TWENTE RESEARCH GROUP HUMAN CENTERED DESIGN

R: First of all, I'd like to get your permission to record this meeting.
Dr. Ozkaramanli: That's fine, thank you.
R: I now have a couple of questions, I'd like you to tell me a little bit about your education and your career background, if you don't mind.
Dr. Ozkaramanli: Yes, sure. Education… I did as a bachelor's study, I actually did Industrial Engineering and Industrial Design, that was in the states. I also did a master's in Human Factors and Ergonomics then I came to the Netherlands and then I did a master's study in Industrial Design: Design for Interaction, which I think is, maybe the same as Mafalda did.
R: Was this in Delft as well?
Dr. Ozkaramanli: Delft yes, and then I stayed in Delft for my PhD… and I did a PhD in Design for Emotion and Subjective Wellbeing, that was our group: Delft Institute for Positive Design. And I did a PhD in which I developed Dilemma driven design.
R: Yes, I think Mafalda has present your work to us, in class. So, my project is focused on mental health applications, I'd like to know your general thoughts on it, and you can elaborate in what you think are the positive and negative implications of these and what you think of them in general?
Dr. Ozkaramanli: Mental health applications? How do you define mental health applications?
R: I'm working on a smartphone mental health application, at this point.
Dr. Ozkaramanli: And could you elaborate? Like, with whom? And is there a company involved?
R: Ok, so my project is… I want to get away from the traditional mental health applications that are in the market right now. So, my main focus is to do something for people in therapy. I'm working with a therapist. And one of my main purpose is to redesign how mood trackers work. I don't know if you're heard of mood trackers. (Shock her head no) Mood trackers and how they work in mental health applications right now is that, they ask the user "how was your day?" or "how did you feel today?" and the user gets either some words or "I felt this level of anxiety" or "I felt this level of stress", and that track the user's mood in a certain period of

time. But I'm redesigning it so it could be incorporated into therapy, in a different way. I'm redesigning with images right now. But I don't know if you've ever used any mental health applications? Do you have any experience with those?

Dr. Ozkaramanli: Not really… I have used headspace, which is mindfulness and meditation, but I used it very briefly. I actually really liked it at the beginning, but then they became very commercial. They do it the library group. But at the beginning it felt like it was a much nicer applications with the animations, I mean, not for the animations, but the rationale behind it was really nice, and then of course the animations and the nice illustrations really helped the brand, but… after that, yea it became very popular and the library grew. But I mean, meditation is meditation, how different can it get? You don't need 90 different videos or explanations for the same thing. So I felt like it was really capitalizing on something that people… basically capitalizing on the anxiety and worry feeling that people have, which is a lot, now-a-days in society, or it was always a lot but we are paying more attention to it now, I don't know. So then I stopped using it.

R: Yes, I didn't think about include mindfulness in my application at first, but mindfulness is a common feature in a lot of the apps. And I did a query, asking people which features they thought were more important, and mindfulness in always in the top 5 actually.

Dr. Ozkaramanli: Yea, but it can also be because that's the most what people hear about.

R: Yes, I think so too.

Dr. Ozkaramanli: And because there are so many different psychology theories and a lot of information in psychology, mindfulness is the most popularized one that you also see outside of a college research, and you also read about it in newspapers and magazines, so…

R: Have you worked in any projects regarding mental health?

Dr. Ozkaramanli: yea, well…yes, I did. Graduation projects from students and… yea… not really in mental health, but of course related topics to mental health.

R: that's also interesting to me.

Dr. Ozkaramanli: A student's graduation project was about work life balance. And there're a lot of psychological concerns that go into what is that balance, that balance changed from person to person but how do you form that balance, how do you define that balance is from person to person is different so we're trying to understand what are the mechanisms that really make people feel imbalance or out of balance. And how to, of course, what would be some mental strategies… What

are some mental strategies that people use to deal with imbalance? So that was quite nice.

R: That sounds very interesting, yes! How do you see that technology has had, or might have an impact in mental health and therapy, if you want to talk about that a bit?

Dr. Ozkaramanli: Yea, well… It's a very deep question, because here in Twente we do a lot of work on the ethics of technology and we… there is a prominent theory from one of the professors at the university of Twente, Peter-Paul Verbeek, mediation theory and we really look at "how do technologies, mediate people's actions and perceptions" and I THINK that you cannot see technology only as a tool, a neutral tool that doesn't really have any moral influence, but you cannot really see it as a moral agent in itself, so this only implies that these technologies need to be designed very carefully and responsibly, paying attention to all the mediating effects that they have. So basically, how do I see technology? I think yes, if it is absolutely necessary it can enhance therapy, but it cannot replace therapy.

R: No, no… I completely agree with that. That's why I've staying away from… More apps have been arising that are like "you can be your personal therapist", or "you're your own therapist" and completely staying away from those because I don't agree with it. And most apps try to replace therapy which is not at all the aim of my work. My work is aimed at people in therapy, so that… Because my work came from conversations with a lot of my friends that are in therapy, and they often complained that they didn't feel like they were progressing unless they were in therapy. And even me, at some point in my therapy journey, I felt the same. So, I was like, how can we help people feel like with the aid of the therapist they could themselves still make progress when they're outside of therapy. That's mostly the aim of my project.

R: So, you do agree that a smartphone application working side by side with a therapist does make more sense that just…?

Dr. Ozkaramanli: Yes, of course it depends on how that smartphone application is designed. Why should it be an app and not a diary, for example, or an object… or something else, you know? Because smartphone applications you have to design, you have to market them, somebody has to pay for it, somebody has to develop it, it collects data, all of those things. So, I think it is really… I wouldn't say I agree with an app, but I would say I agree with a design that helps enhance therapy.

R: Ok, regarding ethics, because I want to take ethics into consideration in my project, specially because I've recently read about data collection and what is really needed and what is not. Do you have any advice in how to go about making an

application that is still ethically sound, I guess?

Dr.: Well, there's a lot of information on that in literature, so I'd advise to really look into this topic, of course ethics is not one thing that you take into account or you leave out. It's always there. It's whether you see it or not. And, yeah, there are a lot of different theories and principles that need to be taken into account about privacy, about trust. There's a lot of literature on what it is and how to do it, basically. So, I'd definitely for example read the book "Moralizing technology", if not everything, Peter-Paul Verbeek, he also has scientific articles, academic articles on the topic, which summarises the main idea, mediation and analysis. And also, there's a lot of information "privacy by design" has become a field in itself, so specifically focuses on privacy. And in this process of developing the app, I think main things to pay attention to is to talk to… map out who your stakeholders are in this design process, you'll have a therapist, you'll have a patient, you'll have a developer, you'll have a designer… you'll maybe have the caretakers of the patient, or friends or family, for example who are also influenced by this design, not directly but indirectly. And then, you talk to these people and you keep them involved in the design process. And you don't only talk about, you know, what do they want or need from such a design, but you also talk about the moral implications, or the moral influences of this.

R: I've only recently started reading about ethics, so I didn't include any questions regarding it in my previous queries, but I really do think it's very important, specially right now, that privacy is something that should really be taken into account. One question that might be a bit out of topic, I guess, but one of the features that a lot people wanted, but I don't fully believe in, and I've discussed with the therapist that I'm working with, is… Do you believe that keeping in contact with patients in between therapy sessions, is it harmful or not, what are your thoughts on this?

Dr.: What do you mean? Like being able to connect to the therapist in between sessions from a patient perspective? Or from a therapist perspective?

R: Both, but I think more from a patient's perspective. Although the therapist will have access to his side of the app, I think patients really want it, but I think it could be harmful in some way. So, I was thinking about limiting those. Like, having it there, but it being a limited feature.

Dr.: I don't think you can really make that decision for the patient.

R: Not for the patient, or even... what the therapist suggested is, that he will only answer the patient, if he deems it necessary. Because there's this thought of the therapist being a crutch and if he is always there, as a crutch, patients can't really progress on their own.

Dr.: Uhun, uhun.

R: So that was one of my main problems with having a direct messaging system between patients and therapist.

Dr.: Yes, but this already happens without an app, I mean. You probably… The therapist tells you what your needs are, I think it's something to be really negotiated with the therapist, then with the patient.

R: Ok. So, your work is on a slightly different field, Mafalda did suggest that I talk to you, and I think you have some really good input. Do you have any suggestions or questions for me or anything?

Dr.: Ah, regarding you design you mean? Well, I'd say, be open minded, it doesn't have to be an app.

R: I did consider this. I'm not in the beginning or my project anymore. And I didn't consider, what else it could be. And I do want to make journaling a part of it, but what made me opt for it being an app, is the way I'm designing my mood tracker. And the fact that right now, mobile phones are everywhere with you. So if you're not ok, at some point, and you forgot your journal, you forgot anything, your mobile phone is always there. So that was one of main reasons. That and the way I'm doing a mood tracker, which is image based. What is happening is that… Have you heard of the PANAS scale? The positive and negative affect scale?

Dr.: Uhun

R: It is a measuring tool at an emotion level. And what I'm doing it asking the patients to choose one picture out of several, that… like "what picture do you relate the most with today?" and they will choose that picture and then, after that, they will choose emotions from the PANAS scale, which is actually a design tool for measuring emotions, that can be quantified, and then those results from the mood tracker will be used in the next therapy session, like the therapist will go "ok, why do you think you choose this image? Why did you associate this emotion with this image?" and things like that, so… right now, mobile apps seem like the most viable way to do that for me.

Dr.: Ok… There are different types of therapy as well, so is there a specific therapy that…

R: The therapist I'm working with is a humanist therapist, so he has a very open-minded approach to therapy and a lot of his work is… He will only talk about something if the patient brings it up, so his approach is quite from CBT or from psychoanalytic therapy. And I did talk to more therapists but this one was the one that agreed to work with me. And I'm least experienced with this type of therapy.

Most more traditional therapists in the psychoanalytic field, do not agree with what I'm doing. I had one therapist tell me that she believes that all the work should be done in therapy and patients should do no work by themselves outside of therapy. So, it's really not something that I personally agree with or that I can use for my work.

Dr.: Uhun. Yes, of course there are all these different traditions, and they work in the way that they work, and... so yeah… Sounds interesting.

R: You've given me a lot of literature, especially on the ethics part. So, thank you very much for taking the time to talking to me.

Dr.: Good luck! Bye!

R: Bye!

APPENDIX C

INTERVIEW WITH DR. GEKE LUDDEN, PHD

INTERVIEW WITH DR. GEKE LUDDEN
PROFESSOR AND HEAD OF THE INTERACTION DESIGN DEPARTMENT

R: Firstly, I'd like to get your permission, no won record, to record the interview.
Dr. Ludden: Yes, ok.
R: Thank you very much. So First of all, I'd like you to tell me a little bit about your education and your career background, please.
Dr. Ludden: Ok, I was trained as an industrial design engineer, and I did a Phd on Design for Experience and I'm now a professor of interaction Design.
R: Ok, and then… I know your work is a lot more focused on design for wellbeing, right now…
Dr. Ludden: Yes…
R: From what I've seen from your articles, but I'd like to know your general thoughts on mental health applications, or interaction design ways to develop the mental health field further.
Dr. Ludden: Hm, that's a very broad question.
R: It is. I'm starting with the broad questions.
Dr. Ludden: So, from the work that we are doing, we know that technology is sometimes seen as a solution for some of the products in the mental health care system. And some of the problems are that people sometimes don't feel empowered to make the step towards mental healthcare and also that their time with mental health specialists, so therapists or care professionals, is limited, and that leads to the developed of platforms or mobile applications that people can use to self-manage their mental health. This is sometimes difficult, because not every mental health professional feels that technology should quietly take over or support mental health care. And that's something that we are now working on, so… On the one hand making these platforms and mobile applications more engaging so that people want to use them but also in another project we're trying to focus on the concept of compassionate technology. Because compassion is such an important value in mental healthcare and most of the technology that's now under development is not really taking this value into account.
R: Ok, can you elaborate on how you're going about making them more engaging?
Dr: Ludden: On how to make them more engaging? Well, that's absolutely the

starting point of our research, but we don't have that many answers yet.
R: So, you're currently with mental health, in the field of mental health as well?
Dr: Ludden: With partners in the field of mental health, yes.
R: What "does and don'ts", have you learnt concerning the user's perspective from… I don't know if I'm making myself clear. Like, taking in account the user, which is something that I think a lot of mental health applications, don't take into account at all these days, from analysis I've done for my thesis. What do you think are the major "does and don'ts" that, or mistakes that applications have made?
Dr. Ludden: Well, it's not very clear from research, what does and don'ts are, but what we do know is that adherence to working with these applications and platforms is not always good. And my personal opinion about that is that one of the problems is that we're just making applications and platforms that are completely hidden inside computers or mobile phones, and they don't interact with the lives of the people using them.
R: Ok. That does make sense. I'm presentating a paper at a conference, next week, and one of the thingsI did was analyse mental health, specifically mood tracker applications, beucase I'm designin one for my thesis. And one of the major things that I found out, was that they always use the same two or three interaction styles, they don't vary a lot, and they're designing for a geral public, they have no specialist aid, and there's not guidelines for mental health applications and they're designed for people in geral, so they don't even take into account the users that are looking for these applications. So what you said, really goes with what I've researched and learnt, so that's very interesting. So, have you heard about mood trackers?
Dr. Ludden: Yes.
R: And do you think these are useful or harmful, or what are you thoughts on them?
Dr. Ludden: Hmmm, well, I think they can be useful, but I think one of the problems with mood trackers is that, well the ones that I know, don't provide people a lot of guidance in how to reflect on their mood states, so that is a problem I think. Just tracking your mood and not knowing how to make sense of the data is really difficult.
R: Yea, most people when they track their moods they are not qualifies to find patterns in the moods, which is what mood trackers are design to do.
Dr. Ludden: Yes, exactly.
R: Hmm, so one of the reasons that made me start my thesis on this specific topic, is that in conversations with a lot of my friends that go to therapy, they felt very lost in between therapy sessions. They felt like they only made progress during therapy

and in between sessions they felt like they were completely lost. So, I'm trying to design a mental health application, whose main point is a mood tracker, but it won't just be a mood tracker, it's also going to be a journal, and I'm making it mobile, so that people can have it everywhere. I wouldn't have been my first choice, but mobile is the most portable thing we have.

Dr. Ludden: Yea.

R: And I'm also co-designing it with a licensed therapist, right now. And I'm doing, is trying to create a completely… I'm trying to stay away from the "regular" mood trackers you see in the market, that ask you "how's your day been?" or "how do you feel today?" and you just have a bunch of listed words that are feelings and emotions to choose from. Another thing, I found from my research, is that most of the time they only allow you to pick one single emotion, and as human beings I don't… I can't remember the last time that I felt a single emotion. So, what I'm trying to do, is use images, that have more connotative meanings, and then use theses images and trying and get feelings from theses images that will be different for most people, from the research I've done. And then use this, to kickstart the journaling process and the therapy sessions. What do you think of this as a broad explanation for my thesis?

Dr. Ludden: Yea, I think the use of images is definitely interesting because it's easier for people to reflect probably on images or to relate to images than it is to relate to words. Hmm, maybe also know that in the realm of emotions and having people access their emotions, there have also been some developments using very short animations of emotions, of someone experiencing an emotion. So that people have a better understanding of what that emotion is. So that's another thing, I'm not sure what your images are like, but they could also be, interpreted in different ways by people, which is not necessarily a problem.

R: Yes, that's my main goal, to have the images be interpreted in different ways by as many people as possible, because, in my head at least, that means that the images can have a broad range of emotions associated with them depending on the experience of each person.

Dr. Ludden: But them it's important that when people talk to therapist that they're able to reflect on the images that they choose and why they choose them.

R: Yes. I'm making the mood trackr so that people can associate the emotions with the image… They associate the image with the emotion first, and then they associate words to that image. That's what I'm going for, because I think it's easier to start from an image with a broader view and then try and associated emotion words with

the image itself. About those short animation, do you have any examples that you can provide or do you remember the names of any studies?

Dr. Ludden: Yea, it's the PREMO tool.

R: Oh, yes, the PREMO tool.

Dr. Ludden: That was later further developed into animations and there is also another tool. That was developed by Jay Yun????, what he did was he studies what interactions we associate with moods.

R: Ok, thank you, that's very interesting.

Dr. Ludden: Also, and online tool I think, related to his studies… just trying to see if I can find it.

R: Yes, it's fine, don't worry.

Dr. Ludden: Hmm… emotion prison it's called. It's very much focused on positive emotions, because his studies were around positive emotions. But I thought it was a nice tool. There's also I think a website.. yep, there's a website about emotion prison, it's emotionprison.wordpress.com. (I googled it) And it shows a set of emotions and also an animation, well, the emotion acted out with the products. So I think it's quiet interesting to see. Maybe it will help you with selecting images.

R: Yes, that is very interesting, thank you very much. I'll look further into it, after the interview… Through my… I conducted studies with people, and most of them had not used mental health applications, but I couldn't find more that had… But one of the answers I had, regarding the features to include in the mental health app, was mindfulness, it came up a lot. And I didn't expect mindful to come up as much, but I guess it's the most generally known. What are your thoughts in mindfulness in mental health applications?

Dr. Ludden: My thoughts on mindfulness in mental health applications? Well, mindfulness is one of the tools that's being used in mental health to mostly help people to focus and to develop a state of mindfulness, being mindful. Yea, I've seen very simple tools that just allow you to breathe very slowly andc concentrate on your breathing for a while, but there are also other tools, where a full mindfulness programme has been developed to really take a steps further every time and develop your mindful skills. So there's a large variety in it and I think that generally that these tools can help people to relax and maybe to focus. But again, they're sort of hidden inside the platforms that deliver them and it's maybe sometimes not…. Sometimes sit might feel strange for people to use theses tools, using specially technology that is not very mindful. Like the mobile phone is very distracting and even also a tablet or a laptop or whatever, so I think that it would help if these mindfulness tools were

imbedded in separate or dedicated devices, or object within people's environments.
R: Ok, I get that, I do understand what you're saying. That's one of the reasons why I wanted to stay away from mobile. But then, taking into account that people with anxiety or panic disorder, might have an anxiety or panic attack anywhere, and the thing is always going to be with them, is a mobile phone, that why I choose it as a platform. But I do understand and I do wish I could've worked with something else other than mobile. And I wanted to ask you, if your experience working with design for behavioural change and in the realm of mental health has changed your opinion and how it changed it, about psychology and psychology related to mobile apps, like you were saying… like how did you come about this… you say they should be imbedded in separate devices, and I want you to elaborate more on how your view changed or what made your view change?
Dr. Ludden: Well, mostly, what I just explained, is that people don't feel engaged by the platforms and mobile applications that are currently used. And it's also not really doing justice to the complexity of a person with not only eyes and fingers to use, but having a full body. And I think specially for mental health applications it's important to engage people not only with words and looking at a screen, but it's much more important for people to feel the presence of the space and to feel their present within a space and that's much more mindful and technology could also support that, but then we need other types of technology.
R: Ok, I understand that. Do you remember what I first wanted to write my thesis about? When I was back there for CuriousU.
Dr. Ludden: No. When you were at Twente, you mean?
R: Yes. I wanted to make it about Body Focused Repetitive behaviours (BFRBs).
Dr. Ludden: Yes!
R: And I wanted to completely sty away from whatever was mobile, and I wanted to design a bracelet that was with the person and that could try and prevent, their BFRB, such as skin picking. But I was told that was a PhD work, and not as Master's work.
Dr. Ludden: Yes…
R: I'd have to work in the realm of medicine, I'd have to work with so many people, so that's why I'm working on mental health application right now. But I completely understand what you're saying that there's so much more to take into account. Specially because in my master's I had this course, where we used medical tools, to measure hearth rate and things like that, and that's what I wanted to use. To try and see if there was a change in the persons heartbeat before they engaged in the

BFRB. But I'd have to conduct a whole medical study with people with BFRBs which isn't a thing that is known or common, it's probably common,m but it is not known in Portugal. And I'd have to conduct a study to try and see if there was a correlation. And everyone was like "yea, Rita, you can't do that. It's very interesting work and I know you're very passionate about it, but that amount of work is for a PhD and it's not for a Master's. So maybe eventually in the future I get to work with it.

Dr. Ludden: Yea.

R: Ok, so I think that's it. That was very helpful.

Dr. Ludden: Thank you and thank you for explaining what you're doing, it's nice to hear.

R: Yea, I remember you being interested when I was there, so talking to you now from a different perspective and with one more year of interaction design classes on, it was very interesting.

Dr. Ludden: Thanks and good luck with finishing the project.

APPENDIX D

QUESTIONNAIRE #1 - EMOTIONS ASSOCIATED WITH IMAGES

QUESTIONNAIRE #1 -
PRE-TEST - EMOTIONS ASSOCIATED WITH IMAGES

This questionnaire is part of a study for a Master's Final Project entitled 'The Space in Between Therapy Sessions: Where Interaction Design and Psychology meet', a master degree in Interaction Design.
This study is anonymous and seeks to understand the emotions associated with certain images, colours or even spatial representations. To be further applied in the development of a prototype moodtracker within the final master's project.
This is still the test version which is only being sent to 10 to 20 people. Advice and notes are appreciated.
If possible please pay attention and let me know how long it took you to fill this query.
'The questionnaire is 36 questions long, and is composed of multiple choice and should not take more than 15 minutes to complete.'
'For any questions regarding this query, please contact Rita Branco (branco1@campus.ul.pt). Thank you for your cooperation!'

1. What emotion do you most associate with this picture?
__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

2. What emotion do you most associate with this picture?

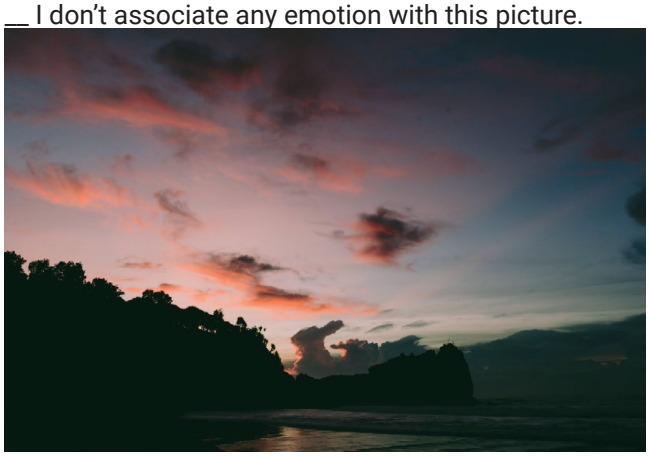
__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

3. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

4. What emotion do
you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

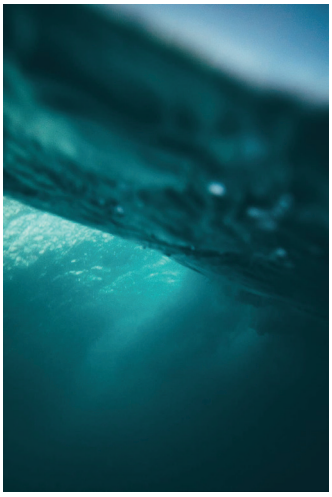


5. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

6. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

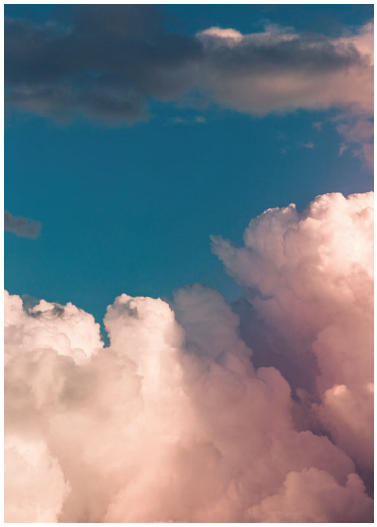


7. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

8. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

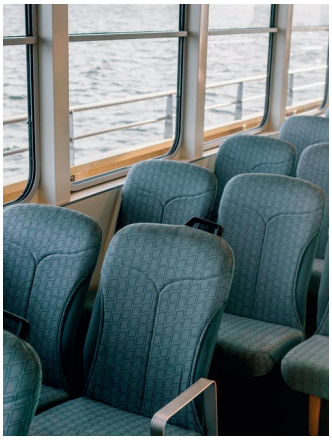


9. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

10. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don’t associate any emotion with this picture.

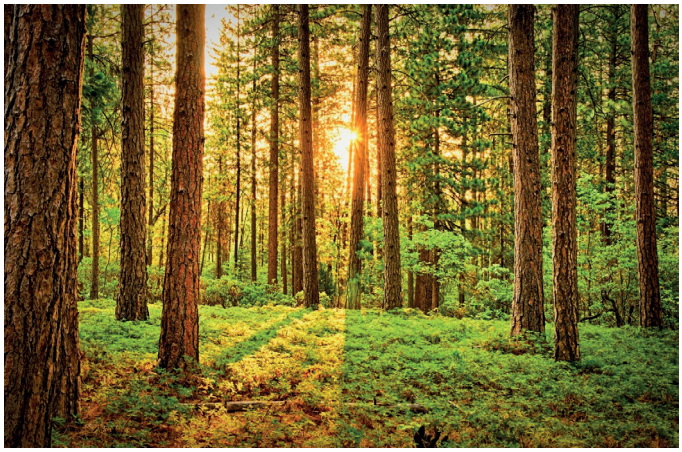


11. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don’t associate any emotion with this picture.

12. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

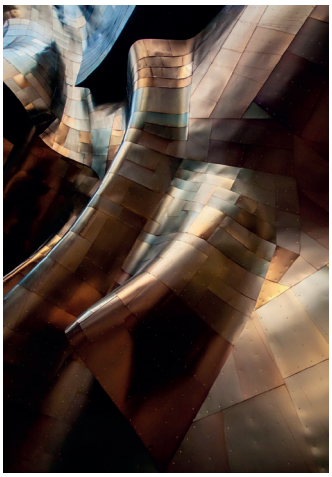


13. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

15. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.



16. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

17. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

18. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

19. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

20. What emotion do you most associate with this picture?

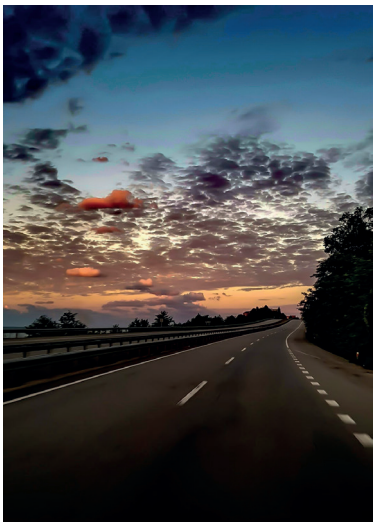
__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

21. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

22. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

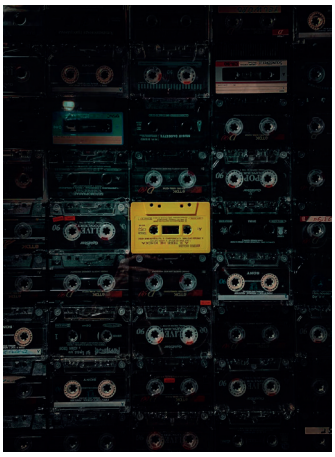


23. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don’t associate any emotion with this picture.

24. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don’t associate any emotion with this picture.

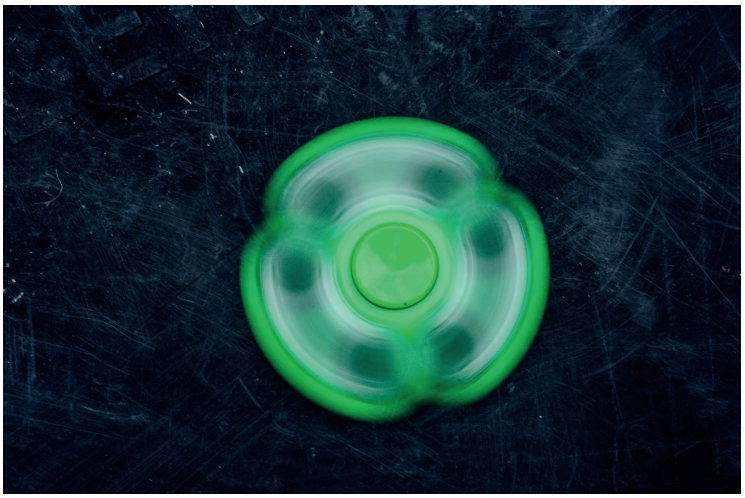


25. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don’t associate any emotion with this picture.

26. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don’t associate any emotion with this picture.

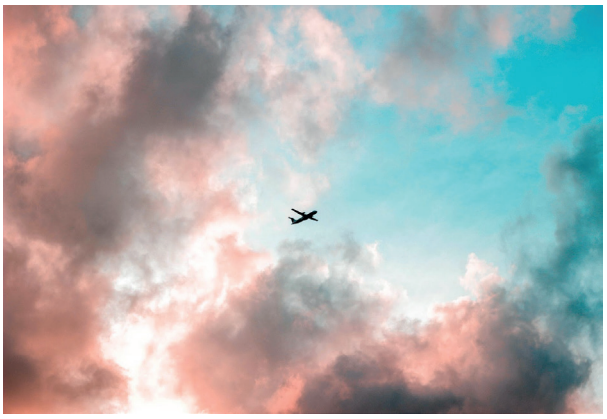


27. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don’t associate any emotion with this picture.

28. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don’t associate any emotion with this picture.



29. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

30. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

31. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

32. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

33. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

34. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

35. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

36. What emotion do you most associate with this picture?

__ Happiness
__ Sadness
__ Anxiety
__ Fear
__ Disgust
__ Loneliness
__ Anger
__ I don't associate any emotion with this picture.

Demographic data

Gender

__Female

__Male

__Other

Age

Nationality

Education (Completed)

__Basic Education

__Secondary School

__Bachelor Degree

__Master Degree

__Phd

If currently studying, what are you studying?

Have you ever been to therapy?

__Yes

__No

Do you currently see a mental health professional in a regular basis?

__Yes

__No

Have you been diagnosed with any of these disorders?

__I haven't been diagnosed with any disorder.

__I don't feel comfortable disclosing this information.

__Depression

__Anxiety

__Borderline Personality Disorder

__Panic Disorder

__Post-traumatic Stress Disorder

__Social Anxiety

__Other...

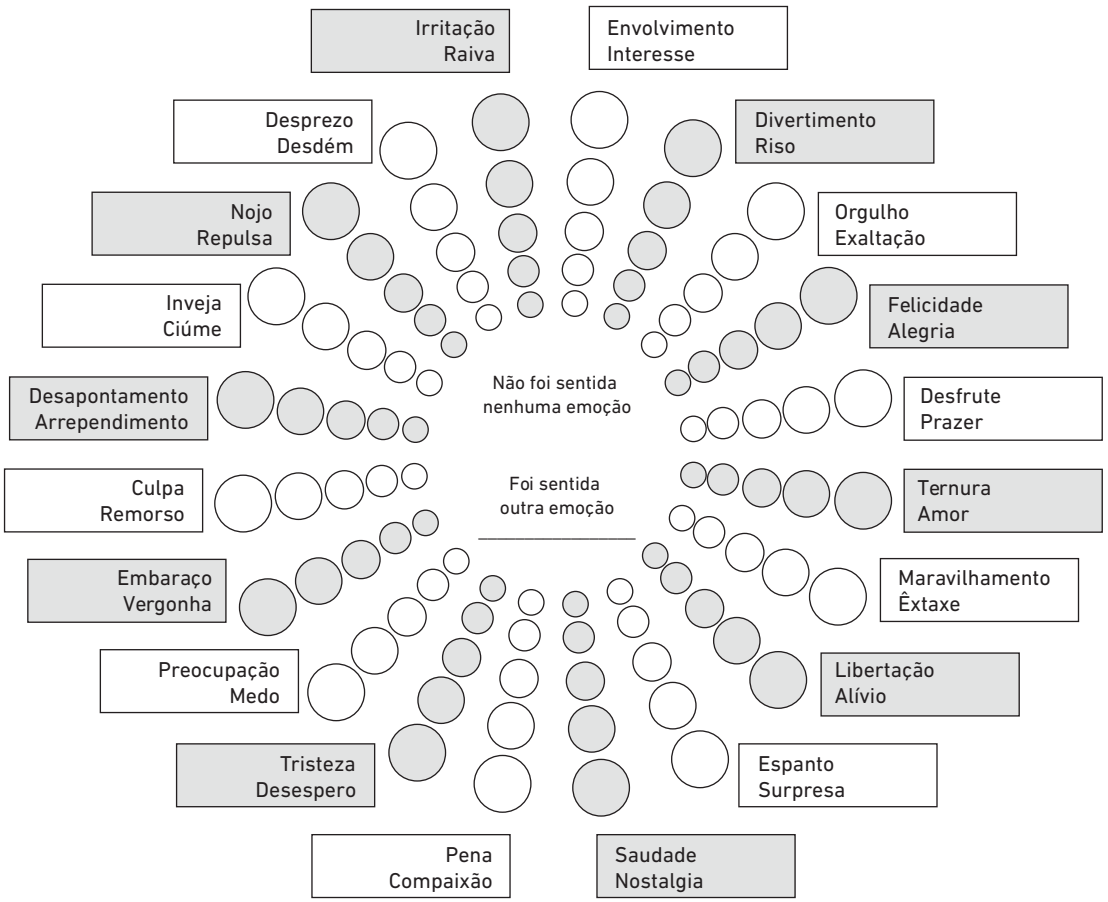
APPENDIX E

QUESTIONNAIRE #2 - GENEVA EMOTION WHEEL AND IMAGES

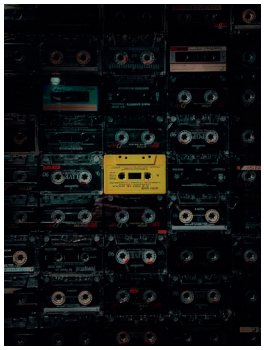
QUESTIONNAIRE #2 -
GENEVA EMOTION WHEEL AND IMAGES

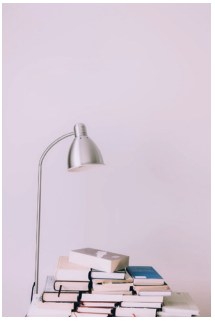
Instruções

Este instrumento, chamado de Roda das Emoções de Genebra, pretende medir, tão precisamente quanto possível, a emoção que sente quando olhar para uma imagem.
De forma a tornar mais fácil o relato do tipo de emoção sentida, 20 conjuntos de emoções distintas foram colocadas num círculo, como mostra a folha de resposta.
Este estudo pretende vir a desenvolver um instrumento que será usado entre e durante sessões de terapia, para iniciar o diálogo e ajudar os pacientes a refletir sobre o que é tratado nas sessões.
Vão-lhe ser mostradas 17 imagens diferentes, e deve escolher, no máximo até 3 emoções que melhor correspondem ao que sente quando vê a imagem, e deve determinar a intensidade com que está a sentir essa emoção, quanto maior for a bola que selecionar, maior a intensidade com que está a sentir essa emoção.
Refira-se que cada par de palavras, por exemplo, as palavras “Irritação e Raiva” também cobre emoções como fúria, incómodo, indignação ou só o estado de estar zangado.
Se não sentir qualquer tipo de emoção, assinale na metade superior do círculo central, se sentiu uma emoção que seja significativamente diferente dos 20 conjuntos de palavras apresentados, coloque essa emoção na metade inferior do círculo central.


Irritação
Raiva
Envolvimento
Interesse
Desprezo
Desdém
Divertimento
Riso
Nojo
Repulsa
Orgulho
Exaltação
Inveja
Ciúme
Felicidade
Alegria
Não foi sentida
nenhuma emoção
Desapontamento
Arrependimento
Desfrute
Prazer
Culpa
Remorso
Foi sentida
outra emoção
Ternura
Amor
Embaraço
Vergonha
Maravilhamento
Êxtaxe
Preocupação
Medo
Libertação
Alívio
Tristeza
Desespero
Espanto
Surpresa
Pena
Compaixão
Saudade
Nostalgia



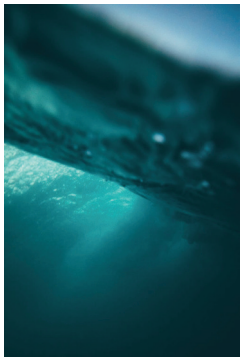


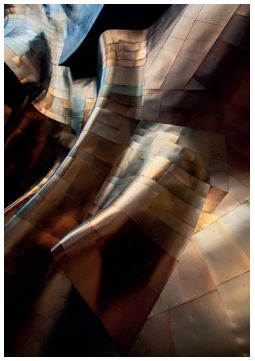
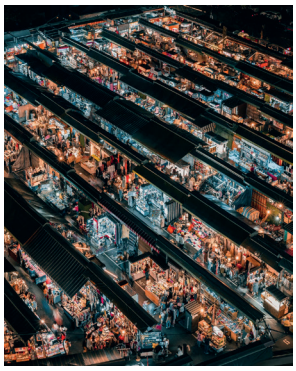











APPENDIX F

QUESTIONNAIRE #3 - PANAS
ASSOCIATED WITH IMAGES

QUESTIONNAIRE #3-
PANAS ASSOCIATED WITH IMAGES

This is a study conducted by an Interaction Design Master's Student, for the thesis "The Space in Between Therapy Sessions: Where interaction Design and Clinical Psychology Meet".
The study aims to compare how useful the PANAS scale can be in the context of mood trackers and therapy and later compare the use of the PANAS scale with the use of the GEW (Geneva Emotion Wheel), another self- measuring tool. PANAS or Positive and Negative Affect Schedule is a scale that consists of different works that describe feelings and emotions. This study, joins the PANAS scale with the use of images in an attempt to find the ones that provide a wider range of emotions/responses.

1. To which extent do you feel each of these emotions when looking at the image bellow.

Interested
__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

Distressed
__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

Excited

__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

Upset

__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

Strong

__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

Guilty

__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

Scared

__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

Hostile

__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

Enthusiastic

__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

Proud

__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

Irritable

__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

Alert

__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

Ashamed

__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

Inspired

__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

Nervous

__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

Determined

__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

Attentive

__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

Jittery

__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

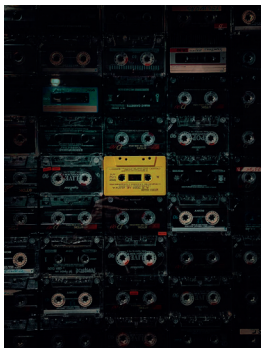
Active

__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all

Afraid

__Extremely
__Quite a bit
__Moderately
__A little
__Very slightly or not at all



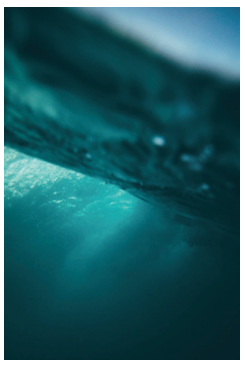


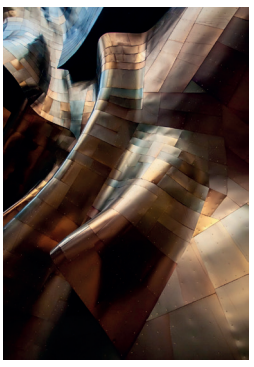


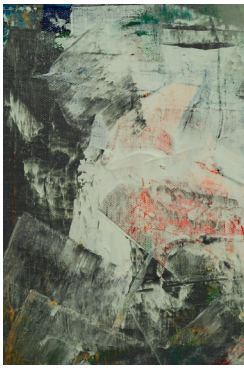












Demographic data

Gender

__Female

__Male

__Other

Age

Nationality

Education (Completed)

__Basic Education

__Secondary School

__Bachelor Degree

__Master Degree

__Phd

Area of Study

If currently studying, what are you studying?

Have you ever been to therapy?

__Yes

__No

Do you currently see a mental health professional in a regular basis?

__Yes

__No

Have you been diagnosed with any of these disorders?

__I haven't been diagnosed with any disorder.

__I don't feel comfortable disclosing this information.

__Depression

__Anxiety

__Borderline Personality Disorder

__Panic Disorder

__Post-traumatic Stress Disorder

__Social Anxiety

__Other...

Thank you for answering this query.
If you found this interesting and want to take part of part 2, I'd really appreciate it, please leave you e-mail bellow.
If you have any questions about PANAS scale or any question in general regarding my work, feel free to contact me at:
branco1@campus.ul.pt
If you want to participate in more queries related to this study please leave your e-mail address bellow. Thank you!

APPENDIX G

QUESTIONNAIRE #4 - MOBILE MENTAL HEALTH APPLICATIONS

QUESTIONNAIRE #3-
MOBILE MENTAL HEALTH APPLICATIONS

This questionnaire is for a study regarding mental health applications and their use in the context of therapy. It's part of a study for an Interaction Design Master's Thesis entitled: "The Space in between Therapy Sessions: Where Interaction Design and Clinical Therapy Meet".

This questionnaire takes approximately 6-10 minutes to answer.

All the information will be used purely for statistic analysis and it is completely anonymous. By filling and submitting the questionnaire you're agreeing to this.

Are you currently undergoing therapy?
__Yes
__No

Have you been in therapy in the past?
__Yes
__No

How long were you/have you been in therapy?

What type of therapy did you attend?
__Psychoanalysis and/or psychodynamic therapy
__Behavior therapy
__Cognitive therapy
__Cognitive-behavioral therapy
__Humanistic therapy
__I don't know
__Other...

Have you used mobile mental health applications before?

__Yes

__No

Approximately, how many mental health mobile applications have you tried?

If the answer to the previous question was yes, please indicate which one(s)? If more than 3, indicate the ones you felt helped you the most.

The next section contains simple affirmations.
On a scale of 1 to 6, where 1 is Completely Disagree and 6 e Completely Agree and 0 is Non-Applicable.
Please choose the answer that you most identify with.

1. I feel like I only make progress during the therapy sessions.
2. While I was in therapy I felt like I was doing important progress outside the therapy sessions. (Please note that 0 is Non-Applicable and 1 is Completely Disagree)
3. I have quickly stopped using all the mental health applications I've tried in the past. (Please note that 0 is Non-Applicable and 1 is Completely Disagree)
4. I have tried using applications to help my progress in therapy. (Please note that 0 is Non-Applicable and 1 is Completely Disagree)
5. I have tried application before/after therapy and they were helpful. (Please note that 0 is Non-Applicable and 1 is Completely Disagree)
6. I have tried application while I was undergoing therapy and they were helpful. (Please note that 0 is Non-Applicable and 1 is Completely Disagree)
7. I am more likely to use an application that is recommended by a therapist.
8. I am more likely to use an application that is recommended by a friend.
9. If I found an application that suited my needs I would be more likely to use it on a daily basis.
10. I would quickly lose interest in any type of mental health application.
11. I am more likely to use an application the more features it has.

Features

This section is about what kind of features you has a user and patient would like a mobile mental health application to have.

Features Explained
. Mood Tracker - a way to track the mood through the day/week or any moment the person deems necessary.
. Journaling - a journal where I could write my thoughts/fear/things to discuss in therapy if I wanted to)
. Direct Messaging with the therapist (however, they would only answered if they deemed necessary)
. Explanations about the most common mental health problem catered to each individual user, by a professional therapist
. Exercises (prescribed to the user by their therapist)
. Mindfulness/Meditation exercises
. Community integration to help you find people with similar problems (having a community based on comments and threads to be able to find and discuss anonymously with people with similar problems.
. Emotional based activities (eg. breathing exercises, anxiety relief, panic attack relief, etc.)
. Behaviour based activities (eg. learning new hobbies)
. Thought-based activities (eg. learning how to reframe negative thoughts)
. Medication and reminders

What kind of features would be the most important for you to have in a mental health mobile application?
MoodTracker
__Not important at all
__Not very important
__Somewhat important
__Important
__Very important
__Extremely important

Journaling

__Not important at all
__Not very important
__Somewhat important
__Important
__Very important
__Extremely important

Direct Messaging with the therapist

__Not important at all
__Not very important
__Somewhat important
__Important
__Very important
__Extremely important

Explanations about common mental health issues

__Not important at all
__Not very important
__Somewhat important
__Important
__Very important
__Extremely important

Exercises (prescribed to you by your therapist)

__Not important at all
__Not very important
__Somewhat important
__Important
__Very important
__Extremely important

Mindfulness/Meditation exercises

__Not important at all
__Not very important
__Somewhat important
__Important
__Very important
__Extremely important

Community integration, allowing you to interact with people with similiar experiences

__Not important at all
__Not very important
__Somewhat important
__Important
__Very important
__Extremely important

Emotional-based activities (eg. breathing exercises, anxiety relief, etc...)

__Not important at all
__Not very important
__Somewhat important
__Important
__Very important
__Extremely important

Behaviour-based activities (eg. learning new hobbies, etc...)

__Not important at all
__Not very important
__Somewhat important
__Important
__Very important
__Extremely important

Thought-based activities (eg. learning how to reframe negative thoughts, etc...)

__Not important at all
__Not very important
__Somewhat important
__Important
__Very important
__Extremely important

Medication and Reminders

__Not important at all
__Not very important
__Somewhat important
__Important
__Very important
__Extremely important

Demographic data

Gender

__Female
__Male
__Other

Age

Nationality

Education (Completed)

__Basic Education
__Secondary School
__Bachelor Degree
__Master Degree
__Phd

Thank you for your answers and your time.
Submit the form when you're ready.

APPENDIX H

QUESTIONNAIRE #5 - SYSTEM USABILITY SCALE

QUESTIONNAIRE #5-
SYSTEM USABILITY SCALE

This is a SUS query that is a follow up to a usability test of the app “Blooming - therapy aid” (working name).
For each of the following statements, please mark one box that best describes your reactions to Blooming today.

I think that I would like to use Blooming frequently.

__ Strongly Disagree
__ Disagree
__ Indecided
__ Agree
__ Strongly Agree

I found Blooming unnecessarily complex.

__ Strongly Disagree
__ Disagree
__ Indecided
__ Agree
__ Strongly Agree

I thought Blooming was easy to use.

__ Strongly Disagree
__ Disagree
__ Indecided
__ Agree
__ Strongly Agree

I think that I would need the support of a technical person to be able to use Blooming.

__ Strongly Disagree
__ Disagree
__ Indecided
__ Agree
__ Strongly Agree

I found the various functions in Blooming were well integrated.

__ Strongly Disagree
__ Disagree
__ Indecided
__ Agree
__ Strongly Agree

I thought there was too much inconsistency in Blooming.

__ Strongly Disagree
__ Disagree
__ Indecided
__ Agree
__ Strongly Agree

I would imagine that most people would learn to use Blooming very quickly.

__ Strongly Disagree
__ Disagree
__ Indecided
__ Agree
__ Strongly Agree

I found Blooming very cumbersome (awkward) to use.

__ Strongly Disagree
__ Disagree
__ Indecided
__ Agree
__ Strongly Agree

I felt very confident using Blooming.

__ Strongly Disagree
__ Disagree
__ Indecided
__ Agree
__ Strongly Agree

I needed to learn a lot of things before I could get going with Blooming.

__ Strongly Disagree
__ Disagree
__ Indecided
__ Agree
__ Strongly Agree

Demographics

Gender

__Female
__Male
__Other...

Age

Education (Completed)

__Basic Education
__Secondary School
__Bachelor Degree
__Master Degree
__Phd

Field of Study/Work

Are you currently in therapy?

__Yes
__No

How long have you been in therapy?

__ <1 year
__ 1 - 2 years
__ 2 - 4 years
__ 4 - 6 years
__ 6+ years

APPENDIX I

R CODE FOR STATISTIC PERMANOVA ANALYSIS

R CODE FOR STATISTIC PERMANOVA ANALYSIS

Code written in Rstudio for the Permanova analysis done to determine if there is a statistically significant difference between the features chosen by people who went to therapy and not, taking into account how many years each person had been in therapy.

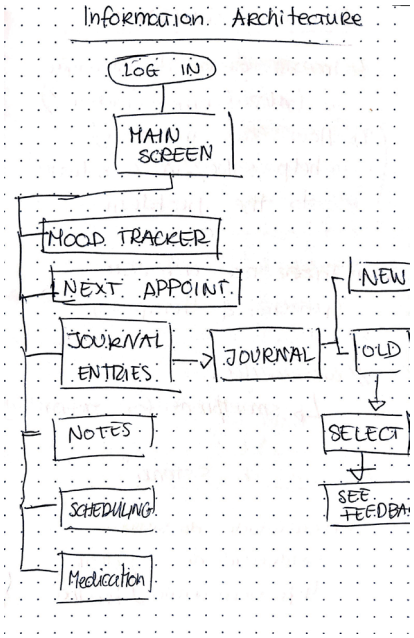
```
####################
# Import & format data #
####################

getwd()
# setwd("/Users/mackbook/Desktop/FAUL/2º Ano/Thesis/R")

library(vegan)
full_table = read.csv("./full_table.csv")
full_table = read.csv("./perma_years_features.csv")
full_table = full_table[,2:ncol(full_table)]

#[R,C]

#newTable = full_table[,c(1:3,14)]
factorTable = full_table [,1:3]
questionTable = full_table[,4:14]

# Se a pessoa respondeu No as duas vai para o No, se respondeu pelo menos um YES vai para o yes
newCat = c() #cmd for vector is c()
for (r in 1:nrow(factorTable)){ #r is a non-global variable created for this for loop
  if (factorTable[r,1] == "No" && factorTable[r,2] == "No" ){
    newCat = c(newCat, "NO")
  } else {
```

```
    newCat = c(newCat, "YES")
  }
}


factorTable = data.frame(therapy_presence = newCat, months = full_table[,3])

# Extremely important       6
# Very important           5
# Important                4
# Somewhat important       3
# Not very important       2
# Not important at all     1

newQuestionTable = matrix(nrow = nrow(questionTable), ncol =
ncol(questionTable))
colnames(newQuestionTable) = colnames(questionTable)

for (r in 1:nrow(questionTable)){
  for (c in 1:ncol(questionTable)){
    if (questionTable[r,c] == "Extremely important"){
      newQuestionTable[r,c] = 6
    } else if (questionTable[r,c] == "Very important"){
      newQuestionTable[r,c] = 5
    } else if (questionTable[r,c] == "Important"){
      newQuestionTable[r,c] = 4
    } else if (questionTable[r,c] == "Somewhat important"){
      newQuestionTable[r,c] = 3
    } else if (questionTable[r,c] == "Not very important"){
      newQuestionTable[r,c] = 2
    } else if (questionTable[r,c] == "Not important at all"){
      newQuestionTable[r,c] = 1
    }

  }
}
```

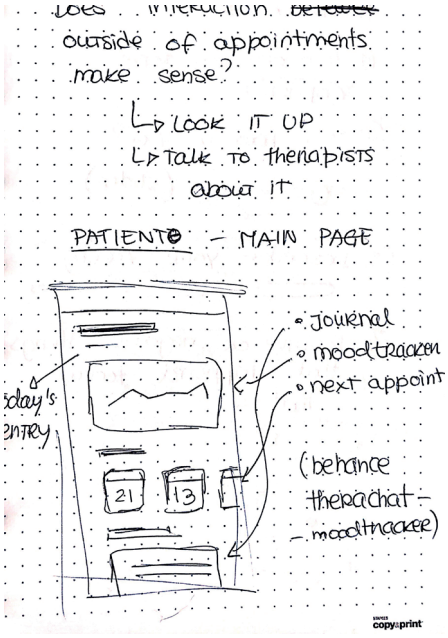
```
###############
## PERMANOVA ##
###############


PERMANOVA = adonis2(newQuestionTable ~ therapy_presence*months, data =
factorTable, permutations = 99999) #expression

write.csv(PERMANOVA, “PERMANOVAResults.csv”)
```

APPENDIX J

WIREFRAMES



Scanned with CamScanner



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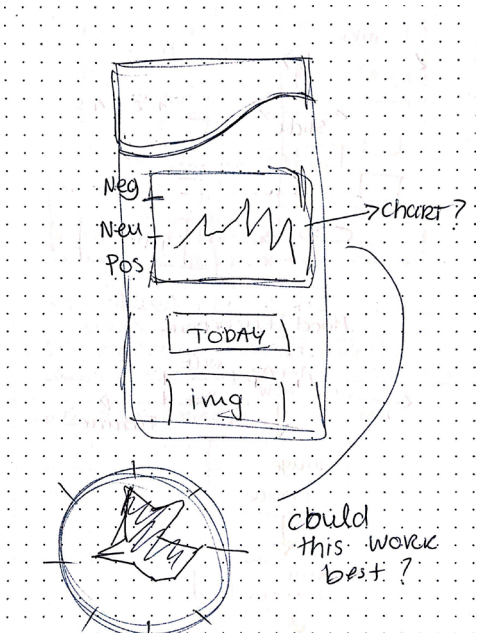

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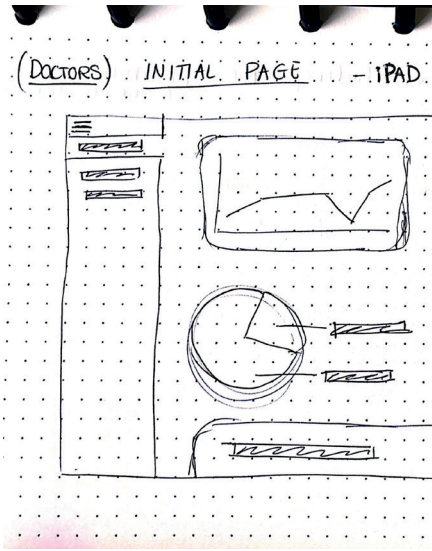

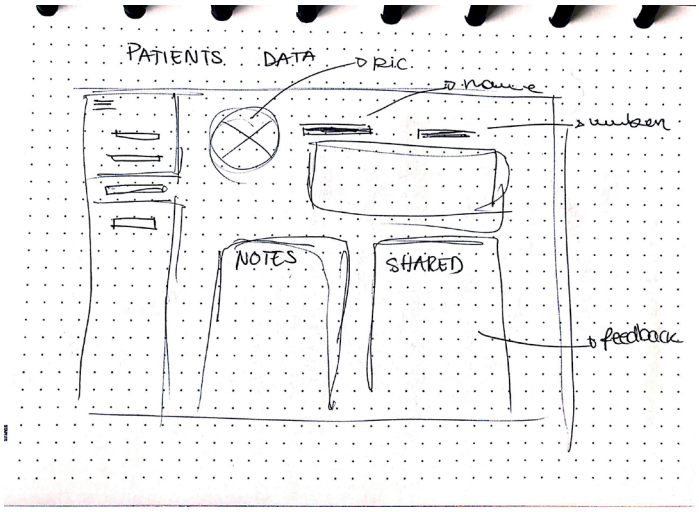

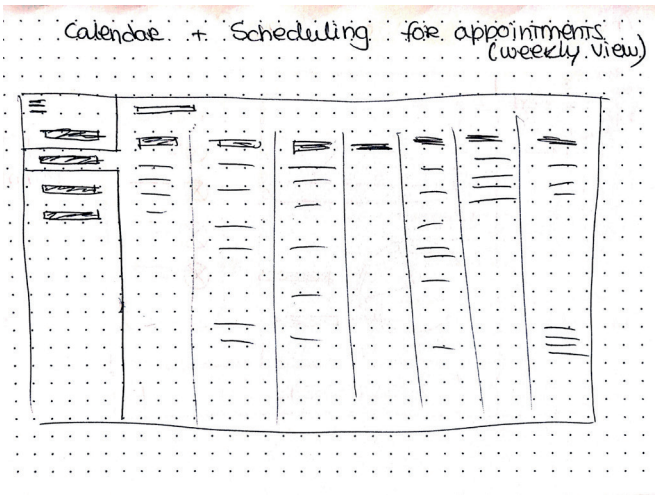

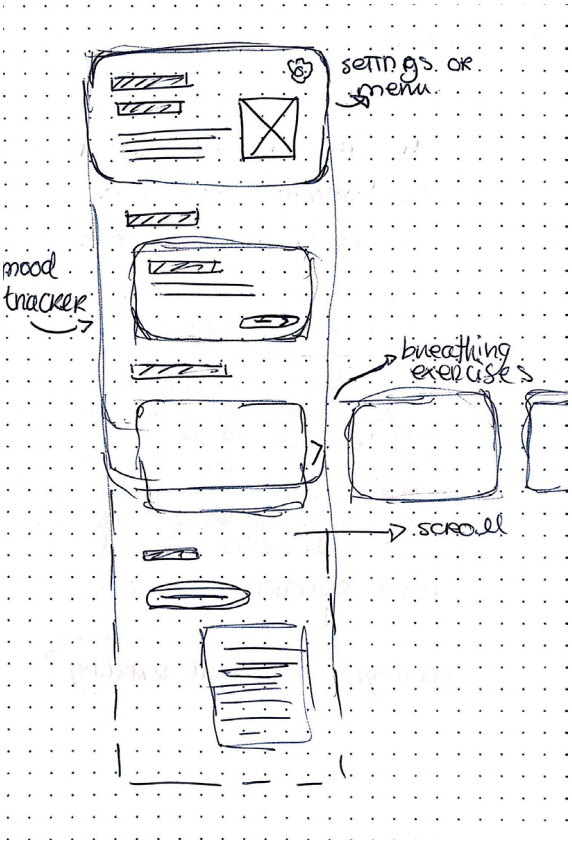

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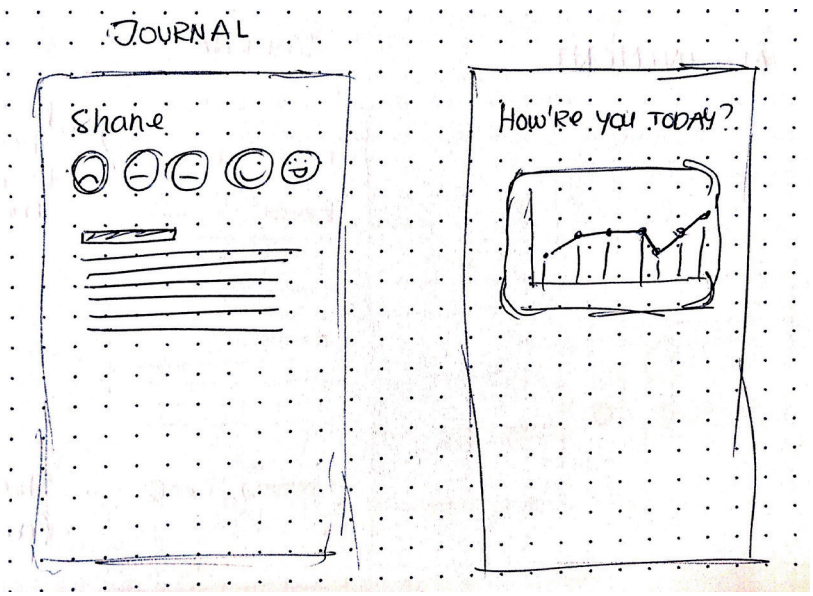
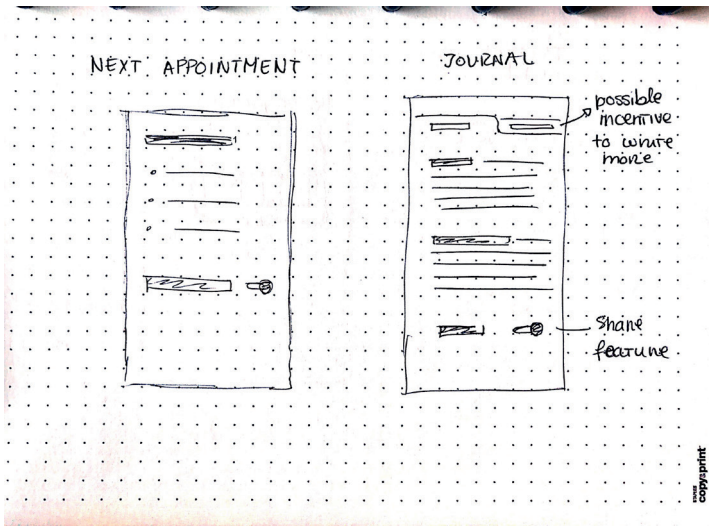
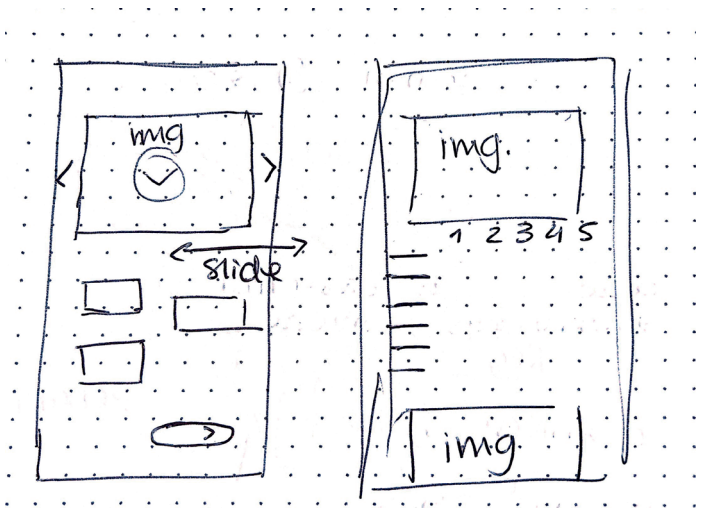
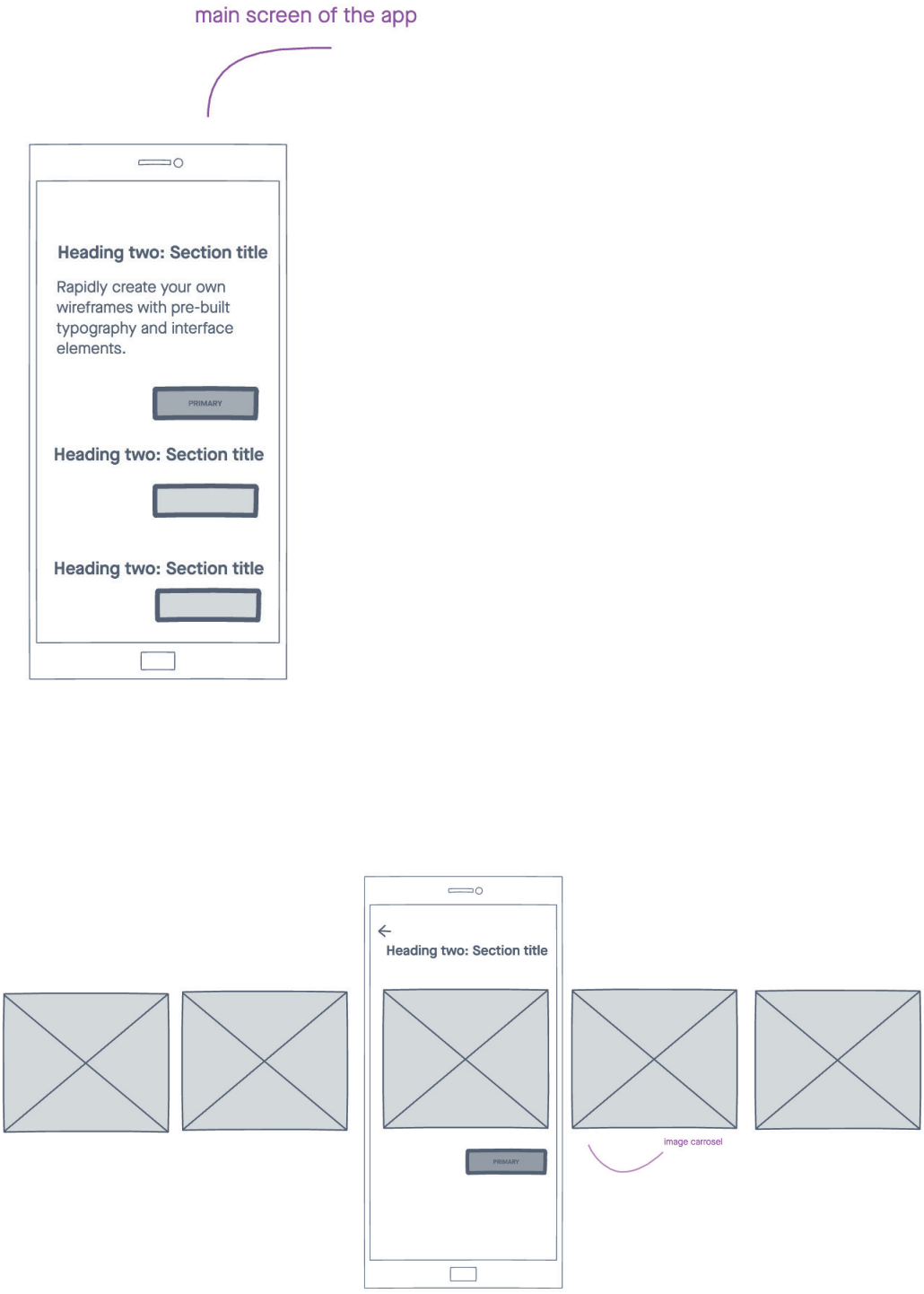
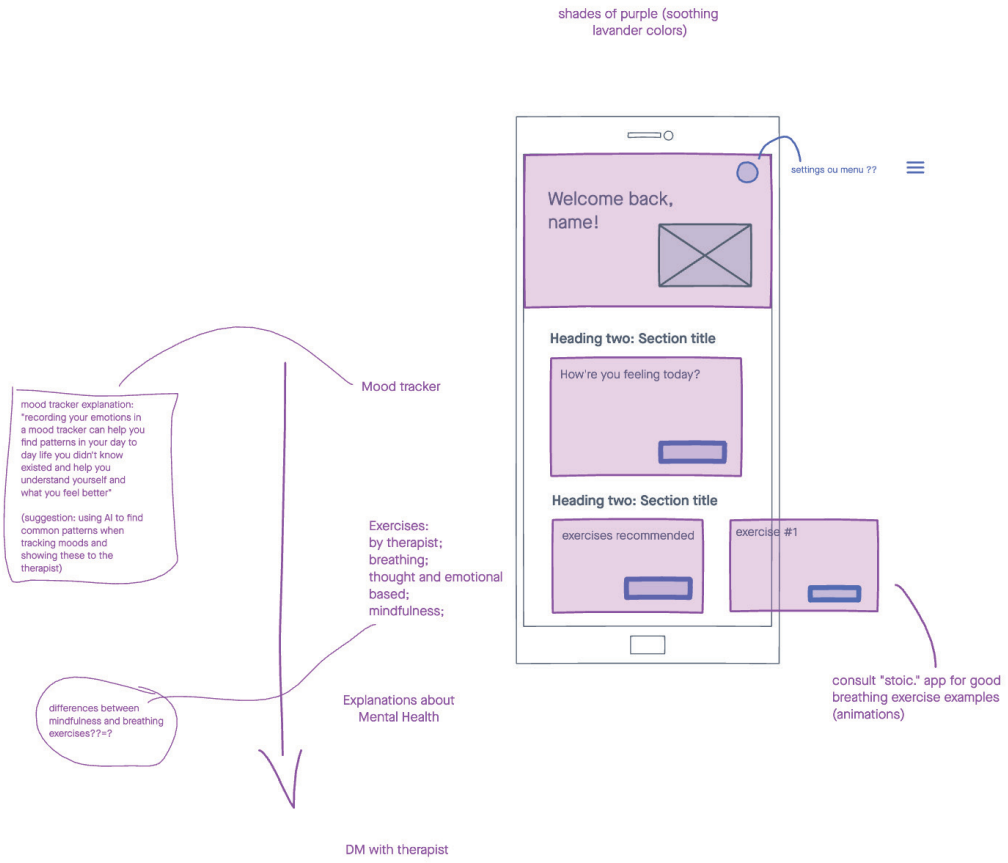






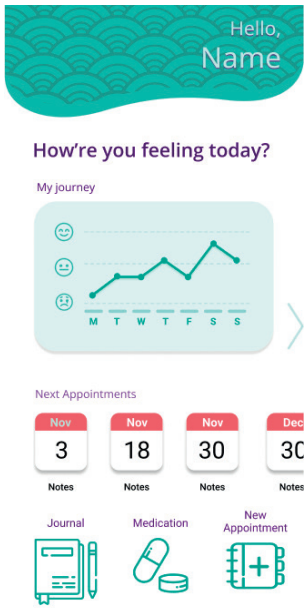

main screen of the app
Heading two: Section title
Rapidly create your own wireframes with pre-built typography and interface elements.
PRIMARY
Heading two: Section title
Heading two: Section title
Heading two: Section title
PRIMARY
image carrosel

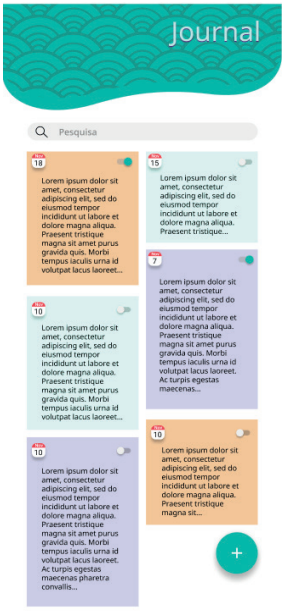
use of the PANAS tool with the images
it would be too tiring for the user to have to answer to the whole PANAS scale on a daily even weekly basis outside of therapy
therefore, we allow the user for choose just some of the emotions and then answer the PANAS scale related to those emotions/feelings.

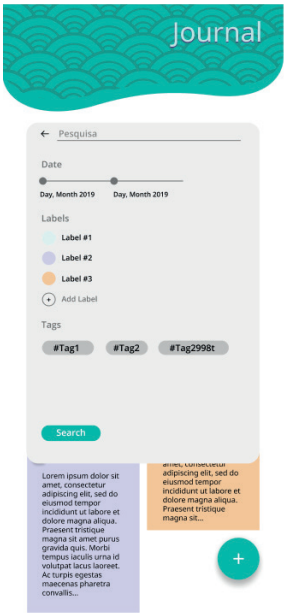


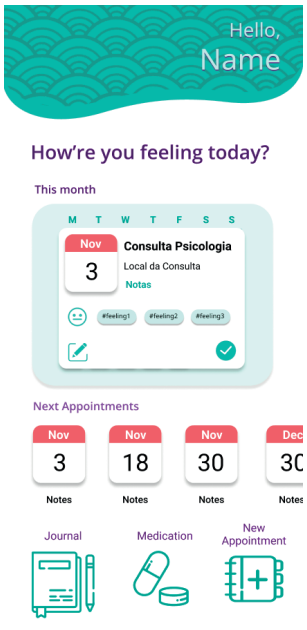
APPENDIX K

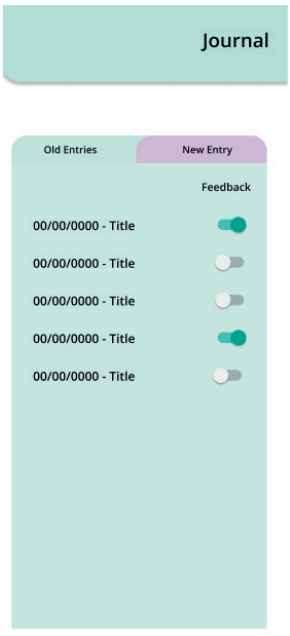
PROTOTYPES

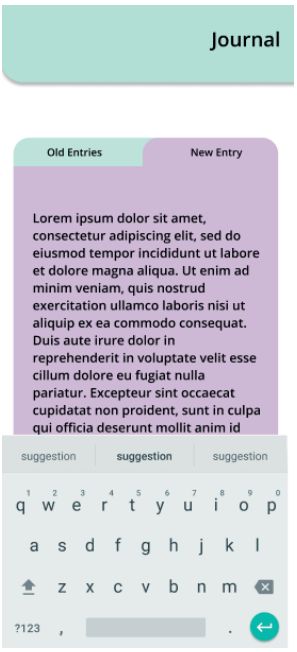

Hello,
Name
How're you feeling today?
My journey
M T W T F S S
Next Appointments
Nov 3 Notes
Nov 18 Notes
Nov 30 Notes
Dec 30 Notes
Journal
Medication
New Appointment


Journal
Pesquisa


Journal
Pesquisa
Date
Day, Month 2019
Day, Month 2019
Labels
Label #1
Label #2
Label #3
Add Label
Tags
#Tag1
#Tag2
#Tag2998t
Search

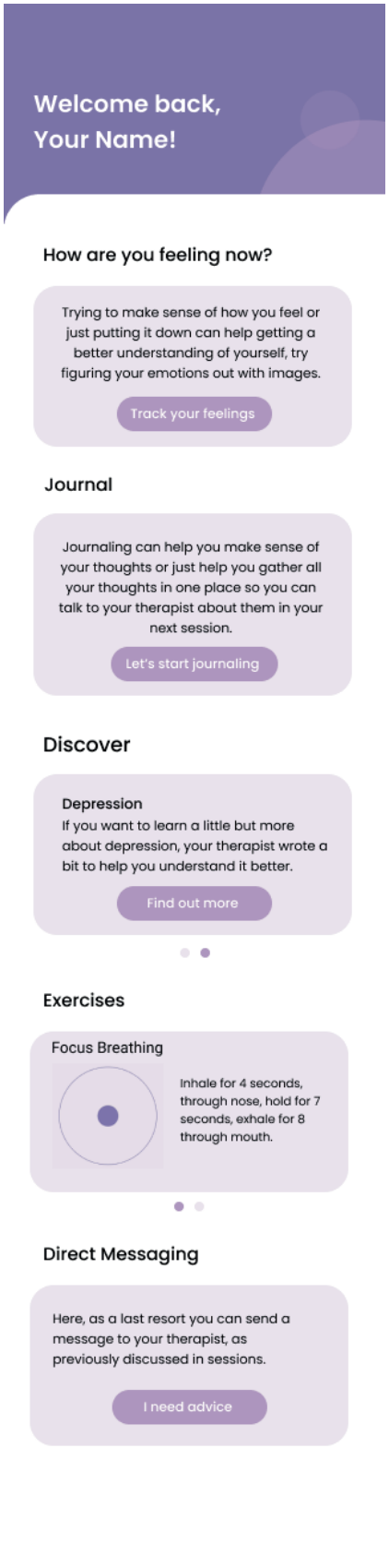

Hello,
Name
How're you feeling today?
This month
M T W T F S S
Nov 3 Consulta Psicologia
Local da Consulta
Notas
Next Appointments
Nov 3 Notes
Nov 18 Notes
Nov 30 Notes
Dec 30 Notes
Journal
Medication
New Appointment


Journal
Old Entries
New Entry
Feedback
00/00/0000 - Title
00/00/0000 - Title
00/00/0000 - Title
00/00/0000 - Title
00/00/0000 - Title


Journal
Old Entries
New Entry
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id
suggestion
suggestion
suggestion

Final prototype available per request to the author in:

https://www.figma.com/file/jNYyUk6ueWNeZo3YoKrxyP/Thesis---Design?node-id=0%3A1

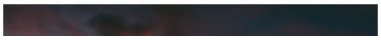


How are you feeling?

Which of these feelings do you associate with this image and today?

- [ ] Interested
- [ ] Irritable
- [ ] Distressed
- [ ] Alert
- [ ] Excited
- [ ] Ashamed
- [ ] Upset
- [ ] Inspired
- [ ] Strong
- [ ] Nervous
- [ ] Guilty
- [ ] Determined
- [ ] Scared
- [ ] Attentive
- [ ] Hostile
- [ ] Jittery
- [ ] Enthusiastic
- [ ] Active
- [ ] Proud
- [ ] Afraid

Next >

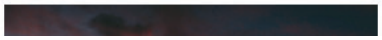


How are you feeling?

Which of these feelings do you associate with this image and today?

- [x] Interested
- [ ] Irritable
- [ ] Distressed
- [x] Alert
- [ ] Excited
- [ ] Ashamed
- [ ] Upset
- [ ] Inspired
- [ ] Strong
- [ ] Nervous
- [ ] Guilty
- [ ] Determined
- [ ] Scared
- [ ] Attentive
- [ ] Hostile
- [ ] Jittery
- [x] Enthusiastic
- [ ] Active
- [ ] Proud
- [ ] Afraid

Next >



How are you feeling?

Today your mood was related to this images and these feelings:

Interested, Alert and Enthusiastic.

Would you like to write some thoughts or points on why this is the combination you choose?*

Not right now

Yes

*Journaling and writing about your choices may be a useful way to kickstart your next therapy session and help you better understand your choices.

How are you feeling?

Today your mood was related to this images and these feelings:

Interested, Alert and Enthusiastic.

Journaling

You can write about why you associated those feelings with that image or with the day, you can write about what you're grateful for today, you can write about what conflicts made you want to track your mood today...

Next

How are you feeling?

Today your mood was related to this images and these feelings:

Interested, Alert and Enthusiastic.

Journaling

Today was a confusing day for me, the fire in the image might represent both the feeling of alertness I got from today, but also my enthusiasm about the small good things that happened.
I'm not sure about what else to write... Maybe the may conflic that happened at work today, but I can't quiet put it into words...
-conflict at work
-small good things happened
-mixed feelings about today

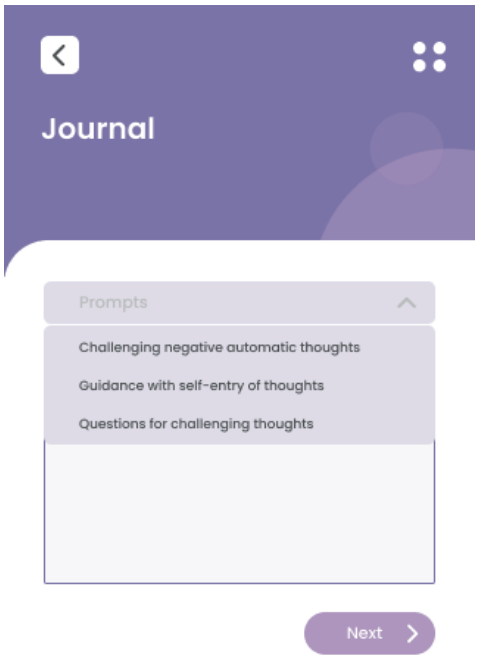
Next

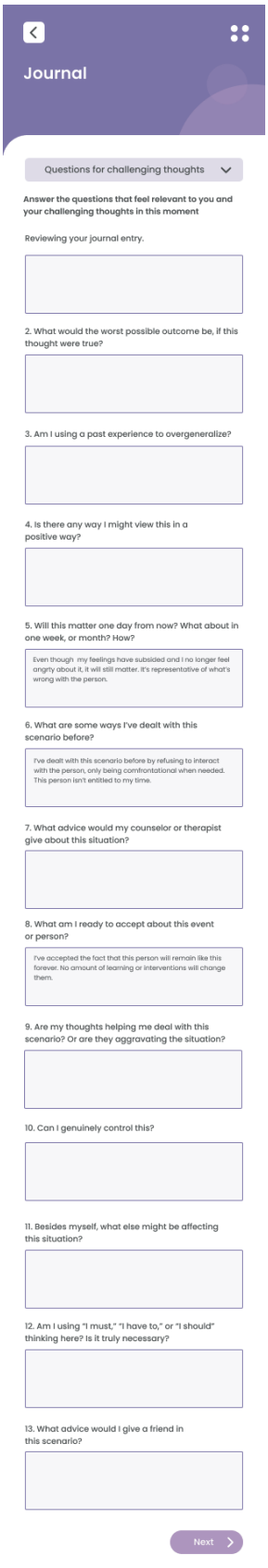
Journal

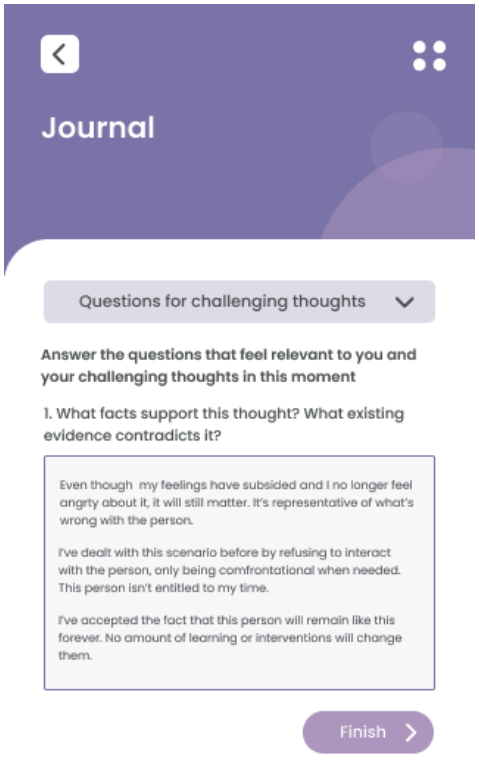
Prompts

You can write about why you associated those feelings with that image or with the day, you can write about what you're grateful for today, you can write about what conflicts made you want to track your mood today...

Next


Journal
Prompts
Challenging negative automatic thoughts
Guidance with self-entry of thoughts
Questions for challenging thoughts
Next


Journal
Questions for challenging thoughts
Answer the questions that feel relevant to you and your challenging thoughts in this moment
Reviewing your journal entry.
2. What would the worst possible outcome be, if this thought were true?
3. Am I using a past experience to overgeneralize?
4. Is there any way I might view this in a positive way?
5. Will this matter one day from now? What about in one week, or month? How?
Even though my feelings have subsided and I no longer feel angrty about it, it will still matter. It's representative of what's wrong with the person.
6. What are some ways I've dealt with this scenario before?
I've dealt with this scenario before by refusing to interact with the person, only being comfrontational when needed. This person isn't entitled to my time.
7. What advice would my counselor or therapist give about this situation?
8. What am I ready to accept about this event or person?
I've accepted the fact that this person will remain like this forever. No amount of learning or interventions will change them.
9. Are my thoughts helping me deal with this scenario? Or are they aggravating the situation?
10. Can I genuinely control this?
11. Besides myself, what else might be affecting this situation?
12. Am I using "I must," "I have to," or "I should" thinking here? Is it truly necessary?
13. What advice would I give a friend in this scenario?
Next


Journal
Questions for challenging thoughts
Answer the questions that feel relevant to you and your challenging thoughts in this moment
1. What facts support this thought? What existing evidence contradicts it?
Even though my feelings have subsided and I no longer feel angrty about it, it will still matter. It's representative of what's wrong with the person.
I've dealt with this scenario before by refusing to interact with the person, only being comfrontational when needed. This person isn't entitled to my time.
I've accepted the fact that this person will remain like this forever. No amount of learning or interventions will change them.
Finish