CHALMERS

Fighting Panic with Haptics!

A designer's approach on how to create products for mental health

M.Sc. Thesis in Industrial Design Engineering

HANNA GUSTAFSSON

SARA YXHAGE

CHALMERS UNIVERSITY OF TECHNOLOGY
Gothenborg, Sweden 2016

Department of Product- and Production Development
Division of Design & Human Factors

Master of Science Thesis

Fighting Panic with Haptics!

Master of Science Thesis

HANNA GUSTAFSSON

SARA YXHAGE

SUPERVISOR: LARS-OLA BLIGÅRD
EXAMINER: LARS-OLA BLIGÅRD

CHALMERS UNIVERSITY OF TECHNOLOGY
Gothenborg, Sweden 2016

Department of Product- and Production Development
Division of Design & Human Factors

Master of Science Thesis PPUX05

Fighting panic with haptics!
Master of Science Thesis in the Master Degree Program, Industrial Design Engineering

Chalmers University of Technology
SE-412 96 Göteborg, Sweden
Telefon +46(0) 31-772 1000

Cover image: Hanna Gustafsson
Print: Repro Service Chalmers

PREFACE

This project is a master's thesis covering 30 credits, conducted during the spring of 2016. The project was conducted by two students at the Industrial Design Engineering programme at the division of Design and Human Factors, department of Product and Production Development, at Chalmers University of Technology.

There is a lot of people whose help have been crucial to the result of this project. First of all, a big thank you to all the brave women and men who have opened up your hearts to us, sharing your experiences of panic attacks and helping us evaluate our concepts, without you this project would not have been possible. Thank you Lars-Ola Bligård, supervisor and examiner of the project, for your help and constant support throughout the project. Thank you MariAnne Karlsson for your advice regarding user experience testing. Also, thank you Sofia Bergfeldt at CTMH for your support and wise design insights throughout the project.

We also want to thank our colleagues at the Industrial Design Engineering programme for your support and feedback during the project, and a special thanks to our opponents and dear friends Pedram Nayeri and Sebastian Olsson for always being there for us when we needed you. Lastly, a big thank you to our friends and families who have supported us and cheered us on.

Gothenburg, June 21st 2016,
Hanna Gustafsson and Sara Yxhage

The authors of this master's thesis, Hanna Gustafsson (left) and Sara Yxhage (right).
Photographer: Victor Bergh Alvergren.

ABSTRACT

Panic attacks is a relatively common problem; among one third of all people have had one during the past year alone (Carlbring and Hanell, 2011). The symptoms of a panic attack include palpitations, accelerated heart rate, shortness of breath, fear of losing control and fear of dying. The current treatments for panic attacks are cognitive behavioural therapy and medication (antidepressants and anxiolytics), but there is a shortage of non-pharmaceutical treatment options.

The master's thesis project *Fighting panic with haptics!* intended to investigate the possibilities of creating a product that in some way helps against panic attacks. The investigation included a survey and in depth interviews with individuals suffering from panic attacks as well as literature studies and interviews with experts treating people with panic attacks. The analysis had a productification focus and the main problem was framed to be *the internal focus on symptoms and anxious thoughts*. A potential issue in creating a product against panic attacks is that a "safety behaviour" is created which is something that at first glance seems to lessen the panic, but in reality just maintains the fear for what is perceived as a threat. The desired effect of a future product is thus to *break the internal focus by including the external world through a sensory input*, while at the same time, give space for acceptance of one's panic attacks and reflection in order to process them so to not create a safety behaviour.

Three concepts were created to tackle different issues in panic attacks: *distraction* from focus on symptoms, *comfort* to recover faster and *externalisation* for reflection on one's reactions by mimicking the reactions in a product. Evaluation tests with individuals with experience of panic attacks were done in which they experienced models of the concepts in a non-panic situation and evaluated whether they thought they could be helpful in a panic attack. The results showed that individual preferences exist and the participants believed in the distraction and comforting concepts whereas the externalisation concept was more difficult to understand from the experience of the model. However, when explaining the idea, also this concept seemed promising.

The idea was never to choose the "best" concept, but rather to cover a larger part of the panic attack cycle and to show that the preferences and specific symptoms and problems differ enormously between individuals and that one size does not fit all, but instead offer a range of products where the individual can choose.

TABLE OF CONTENTS

1. INTRODUCTION

The introduction contains a description of the background to this master's thesis, as well as its aim, goals, partners, the structure of the report and finally some tips on how to read this report.

1.1 BACKGROUND

According to an estimation by Carlbring and Hanell (2011), around one third of all people in the world have experienced a panic attack during the past year alone. Thus, panic attacks are an issue that affects many people. A panic attack can be described as a period of intense fear, and the symptoms range from accelerated heart rate, shortness of breath, nausea, fear of losing control or going crazy and a fear of dying (Semple and Smyth, 2013). Furthermore, Carlbring and Hanell (2011) explains panic attacks as a fight or flight reaction to an imaginary threat. The fight or flight reaction can be catalysed by for example stress, hyperventilation, fear of normal bodily reactions and misinterpretations of bodily symptoms.

Some persons have recurrent panic attacks, and they often have a persistent worry about having another attack or worry about the consequences of having panic attacks. These can be diagnosed with panic disorder, and according to Semple and Smyth (2013) the lifetime prevalence of this condition is 1,5-3,7%. The two most common ages of onset of panic disorder are 15-24 years and 45-54 years of age, and women are two to three times more likely of being affected than men (Semple and Smyth, 2013).

The symptoms and implications of panic attacks and panic disorder are of course very frightening and troublesome, and aside from the personal suffering, Team Proximum at CTMH estimated that the socio economic cost reaches 21 billion SEK per year. This is due to decreased productivity, increased mortality and treatments for patients.

The available treatment options are different therapies and medications, and most commonly cognitive behavioural therapy and antidepressants or anxiolytics are used, either separately or in combination (Semple and Smyth, 2013). However, these options do not fit all. Some feel as though the cognitive behavioural therapy is not enough, and others experience that the medicine does not have any effect. Thus, there is room for another way of helping persons struggling with panic attacks - the designer's approach.

1.2 AIM

The aim is to investigate the possibilities for productification in the area of panic attacks. Furthermore, the aim is to develop a product or products, i.e. not a medicine or a therapy method that can help persons suffering from panic attacks and panic disorder.

1.3 GOALS

The goal is to, within the frames of this master's thesis, develop one or more product concept(s) that can work against panic attacks. The product(s) should make the panic attacks less difficult for the user and/or help alleviate the user from the panic attack and should be focused on the core issues of panic attacks.

1.4 PARTNERS

The initiator of this project is Team Proximum that are a part of the Clinical Innovation Fellowships provided by the Centre For Technology in Medicine and Health (CTMH). CTMH is a cooperative body between Karolinska Institutet, Kungliga Tekniska Högskolan and

Stockholms Läns Landsting and has the mission of helping Stockholm to become a world-class medical technology cluster.

1.5 THE STRUCTURE OF THE REPORT

The report contains the following parts introduction, theory methods and tools, procedure and project process, result, discussion, conclusion, recommendations for future development, references and appendix. The result section is divided into two parts. *Part 1: Framing the problem* deals with the subject of *what* the product should do, and *Part 2: Concept development*, deals with the issue of *how* this should be done. The report structure is shown in figure 1.1, and a more thorough description of the parts is featured below.

2. Theory, methods and tools - presentation of the theories used in the project as well as the methods and tools utilised throughout the process.

3. Procedure and project process - a description of why and how the activities in the project have been conducted.

Part 1: Framing the problem
This section brings up different topics related to the theme panic attacks and discusses them from different points of view. *Part 1* is also concluded with persona descriptions, early product ideas and a conclusion, which defines the desired effect a future product should have. The entire *Part 1* has the same method and aim, but is divided into separate chapters based on the themes.

Chapters 4-9 present different points of views regarding a range of aspects of panic attacks, including:

4. The symptoms and experiences of panic attacks

5. How panic attacks and panic disorder can affect a person's life

6. Panic attack triggers

7. Existing methods for dealing with panic attacks

8. An expert's view on panic attacks

9. Shame and vulnerability

10. The faces and phases of panic attacks - an illustration the persons suffering from panic attacks and the phases of the panic attack cycle.

11. Early product ideas - a presentation of ideas created in the early phases of the process.

12. Conclusion: The desired effect of a future product - is a conclusion of *Part 1*, offering a stepping stone for the concept development phase.

End of Part 1

Part 2: Concept development
This section describes the development of the product. As oppose to *Part 1*, each chapter has a separate aim and are based on separate methods.

13. Exploration of the senses - describes the result of a test, in testing the effect of sensory inputs.

14. Ideation of haptics - describes the result of ideation on the topic of haptic inputs.

15. Exploration of haptics test - describes the results of an initial test, testing concepts and test procedure.

16. Filling the void - describes the result of an idea generating process as well as model construction.

17. Haptic evaluation test - describes the result of a test conducted to evaluate the concepts.

18. The final concepts: Fighting panic with haptics! - describes the design and function of the final concepts.

End of Part 2

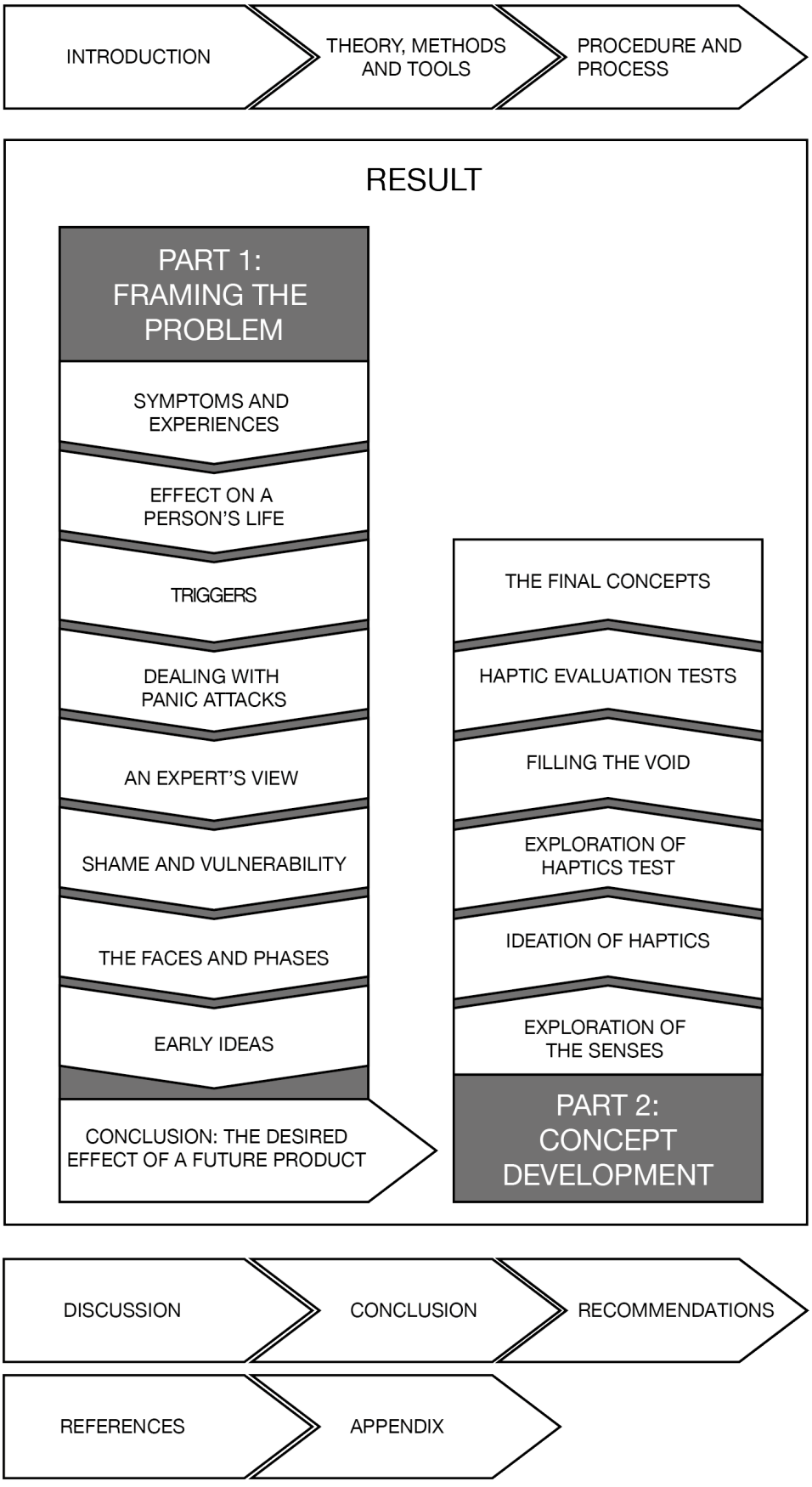


Figure 1.1: The structure of the report.

19. Discussion - discusses the findings and process of the project as a whole.

20. Conclusion - presents the conclusions that can be drawn from the project as a whole.

21. Recommendations for future development - recommendations and advice for future work.

22. References - the references used.

List of appendices - appendices.

1.6 READING TIPS

The report is quite hefty in its content, so it might be difficult to read it in its entirety. The authors of this thesis therefore recommend a reader that wants to learn more about panic attacks to read *Part 1: Framing the problem*, and those who wants to know more about our concept development process to read *Part 2: Concept development*. To see what we found interesting from a product development point of view, one can read the text under the headings "productification" in the chapters.

For the reader who only wants to read a smaller portion of the thesis, the recommendation is to read *Chapter 10: The faces and phases of panic attacks*, containing an illustration of the experiences and persons who have panic attacks, then skip to *Chapter 12: Conclusion: The desired effect of a future product*, to see how we chose to frame the problem, and finally, *Chapter 18: The final concepts: Fighting panic with haptics!* to get the final concepts we created. Here the personas from *Chapter 10: The faces and phases of panic attacks* are revisited and the use of the developed concepts is illustrated.

Enjoy!

2. THEORY, METHODS AND TOOLS

The theory, methods and tools used in the report are presented below. In addition, a small dictionary and definitions list is provided for the reader.

2.1 GLOSSARY AND DEFINITIONS

The study was carried out in Sweden and the interviews were done in Swedish in order to use a language that both the interviewees and interviewers know well, enabling talking about the difficult subject of mental health and difficult experiences. Some words have proved difficult to translate as they differ between Swedish and English. Provided here is a small dictionary of words that differ in the languages. A short list of panic and anxiety related definitions are provided as well.

GLOSSARY

Trygghet - Safety and security. No one English word encompasses what *trygghet* in Swedish does, so a combination of being safe and secure is used in this report.

Ångest - Anxiety. Feeling anxious is often a lighter version of having *ångest*, closer to being worried rather than being *ångestfylld* but is used in this report. Angst is another words for anxiety that is usually concerning a philosophical anxiety about the world or about personal freedom.

Utmattningssyndrom - Exhaustion disorder. An English diagnosis equivalent to *utmattningssyndrom* has not been found, but is called exhaustion disorder in this report.

Panikattack/panikångestattack/ångestattack - Panic attack, anxiety attack. Panic attack has several synonyms in Swedish, and in this report we use *panic attack*, as panic attacks can occur as a physical reaction without anxiety or apparent reasons for anxiety.

DEFINITIONS

Panic attack - A panic attack is a period of intense fear that lasts for approximately 20-30 minutes. The symptoms of a panic attack can vary, but often include accelerated heart rate, shaking and trouble breathing.

Panic disorder - A condition where panic attacks are recurring with a frequency varying form several attacks a day to a few a year. Panic disorder is also often associated with a worry about having another attack or consequences of an attack.

Anticipatory anxiety - Anticipatory anxiety is an anxiety felt *before* of facing a situation that causes anxiety. For example, if a person feels anxious when going by bus, the person can feel anticipatory anxiety prior to going by bus due to the fear of what they might experience on the bus. The anticipatory anxiety can be so strong that it causes panic attacks.

Avoidant behaviour - If a person knows what situations that can trigger anxiety and/or panic attacks, they often start to avoid these situations. Thus, a person who feels anxious and gets panic attacks in many situations and that is resorting to avoidant behaviour can feel very limited in what they can do.

Safety behaviour - A safety behaviour is a behaviour that is seemingly helping a person

to handle a hard or frightening situation, but that maintains the focus on and fuels fear of the real or imaginary threat. In addition to safety behaviours there can be a need for ***safety objects*** and ***safety persons***. These two things make the person feel better, but do not solve the core issue of the fear.

An example of a safety behaviour is a claustrophobic person that feels as though they can handle their phobia by sitting in the end of the cinema row, making them feel in control. In reality, keeping the focus on the exist fuels their fear of being trapped. They are not free of their phobia, but it is maintained.

2.2 THEORY

In this chapter, the theoretical background for this project is presented.

REQUIREMENTS

Requirements are unequivocal, solution-independent and verifiable definitions on what is desirable or undesirable aimed to control and frame the design. Requirements should be developed gradually during the development process, moving from a low level of detail and specification in the early phases of the development, to a higher level of detail and specification in the later phases. This is to avoid creating too many and too specific requirements early on that are hard to handle, and that might narrow down the possible solution-space. The levels of requirements stretch from the users' needs, to detailed descriptions of technical specifications. Due to the vagueness of user needs, a predefined level of fulfilment is hard to determine, and is therefore usually exempted when dealing with needs (Bligård, 2015).

RELIABILITY AND VALIDITY

The term reliability refers to how well data collected during repeated occasions corresponds to each other, independent of the "true value". Thus, if the results from the different data collection occasions correspond well to each other, the reliability is high. Validity, on the other, hand refers to how well the collected data corresponds to the true value, and in which situation and for what target group the data corresponds to the true value. In order to achieve high validity both systematic and random errors must be small. High validity often results in a high reliability, but high reliability does not necessarily result in high validity. Thus, validity is often the most interesting aspect (Bligård, 2015).

THE HUMAN SENSES

The five human senses are sight, hearing, taste, smell and touch. There are sensory receptors in the body that react to light, sound, position, motion, taste and touch that transform the sensory inputs into electrical signals that, via the nerves, are sent to the brain. When the signals from the receptors reach the brain we become aware of, for example, a sound, taste or pain, and this information helps us to react in an appropriate way. The sensory receptors can either be spread in different tissues, as in the skin, or gathered in sensory organs, like the eye or the ear (1177.se, 2005).

HAPTICS

The sense of touch, or haptics, includes the feeling of contact, pressure, heat, cold and pain. These haptic experiences are registered in the skin, muscles, tendons and in the inner organs, and the information received from them gives important information on what happens on the skin as well as the body's position and motion (1177.se, 2005). Haptics are divided into two sub categories, kinaesthetic and tactile. Kinaesthetic input is the input you receive from muscles, joints and tendons. For example, when one holds an object, kinaesthetic feedback tells one about the size and weight of the object as well as how one is holding the object relative to one's body. Tactile input refers to what one feels with one's sensory receptors, i.e., things like vibrations, pressure, touch and texture (quora.com, 2013).

2.3 METHODS AND TOOLS

When performing the data collection, analysis and ideation a number of methods were used. These are presented in this chapter.

DATA COLLECTION

Data collection methods are used to gain an understanding for the users and their situation as well as identifying the needs and requirements of the user.

QUESTIONNAIRE SURVEY

A questionnaire survey is an indirect method for interviewing a person in a structured way, thus there is no contact between the interviewee and the person interviewing. Instead the interviewee answers the questions in written format via a formulary. The applications for a questionnaire survey are:

- Gather data from a large amount of individuals
- Gather data from individuals that are hard to contact in person
- Validate a previous result from interviews

In order to get relevant answers on the questions that are asked, the wording in a questionnaire survey is critical. Furthermore, it is important to construct the survey in a way that makes is possible to analyse the result in a desired way (Trost & Hultåker, 2007 and Kylén, 2004, in Bligård, 2015).

INTERVIEWS

Interviews are used to gain subjective data on how users are thinking. Interviews can be structured (the questions have been formulated in detail in advance), unstructured (a free discussion on a topic) or semi structured (questions have been formulated in advance, but the discussion on them are conducted more freely). If quantitative data is desired, structured interviews are preferable, and if qualitative data is wanted, unstructured interviews are better (Lantz, 2007 and Kylén, 2004, in Bligård, 2015).

USER JOURNEY

A user journey is a tool for illustrating the user's current or future interaction with a service, website or product. A user journey can also help visualise the user's requirements (theuxreview.co.uk, 2013). In this project however, the user journey has been used as a tool for mapping the user's state of mind before, during and after a panic attack.

2.4 METHODS FOR ANALYSIS

Methods can be used to compile the data gathered during the data collection phase, thus achieving a deeper understanding of the data.

KJ-ANALYSIS

During a KJ-analysis, quotes from the data collection are written down on notes and grouped on the basis of their common denominators. The information can then be further grouped into subgroups and be analysed. The KJ-analysis can help compile large amounts of data and make it understandable (uie.com, 2004).

SKETCHES AND MODELS

Analogue sketches with pen and paper and digital sketches assisted by a computer, is a good way of exploring ideas and designs. Models can be seen as sketches that are presented in three dimensions. Thus a model represents a physical description of the design, and can be used both for testing and presenting the design (Bligård, 2015).

PERSONA

Creating personas is used as a tool for working with user-centred design. Personas are descriptions of imaginary people, showcasing archetypical characters of a user group that shares common goals, attitudes and behaviours (Pruitt and Aldin, 2006).

3. PROCEDURE AND PROJECT PROCESS

The process of this project is separated into two parts, one part aiming to frame the problem and investigate the different perspectives on panic attacks, and the other part aiming to make a product against panic attacks. The process in the first part, later referred to as *Part 1: Framing the problem****, was inspired by the effect design level of Lars-Ola Bligård's framework shown in figure 3.1 (Bligård, 2015), with the addition of an extensive study leading up to the identification of the problem. The second part, later referred to as*** *Part 2: Concept development****, was also inspired by Bligård's thoughts on the product development process with respect to focus on the use of, and interaction with, the product, however, the framework was not followed rigorously in this part.***

The process, *Part 1: Framing the problem* ***as well as*** *Part 2: Concept development****, was also permeated with Bligård's (2015) ideas on the iterative nature of the product development process, i.e., that planning, data collection, evaluation and documentation should be conducted continuously in every phase of the process. The iterative process by Bligård is shown in figure 3.2.***

3.1 PART 1: FRAMING THE PROBLEM

In order for us to gain a deep and wide understanding of panic attacks and panic disorder, data had to be retrieved from many sources. This included a literature study, a questionnaire survey, an interview study with persons suffering from panic attacks, an interview study with experts on the subject, and online data collection. The results from the literature study, questionnaire survey, interviews and online data collection were later collated in order to analyse the different perspectives and compare them to each other. This was done under the topics: *Symptoms of panic attacks, How panic*

		Design levels				
		Effect	Usage	Architecture	Interaction	Elements
Design perspectives	Problem	Main problem	Usage problem	Architecture problem	Interaction problem	Element problems
	Structur	Users, stakeholders and context	Human-machine system	Logical architecture machine	Detailed subdivision machine	Logical architecture elements
	Function	Capabilities and values	System functions	Machine functions	Control and information	Element functions
	Activitet	Intended use	User tasks	Overall interaction	Detailed interaction	Machine process
	Realisation	Possibilites and limitations	Technical principle och introduction	Overall design	Physical form and interfaces	Implementation elements

Figure 3.1: Bligård's framework (2015).

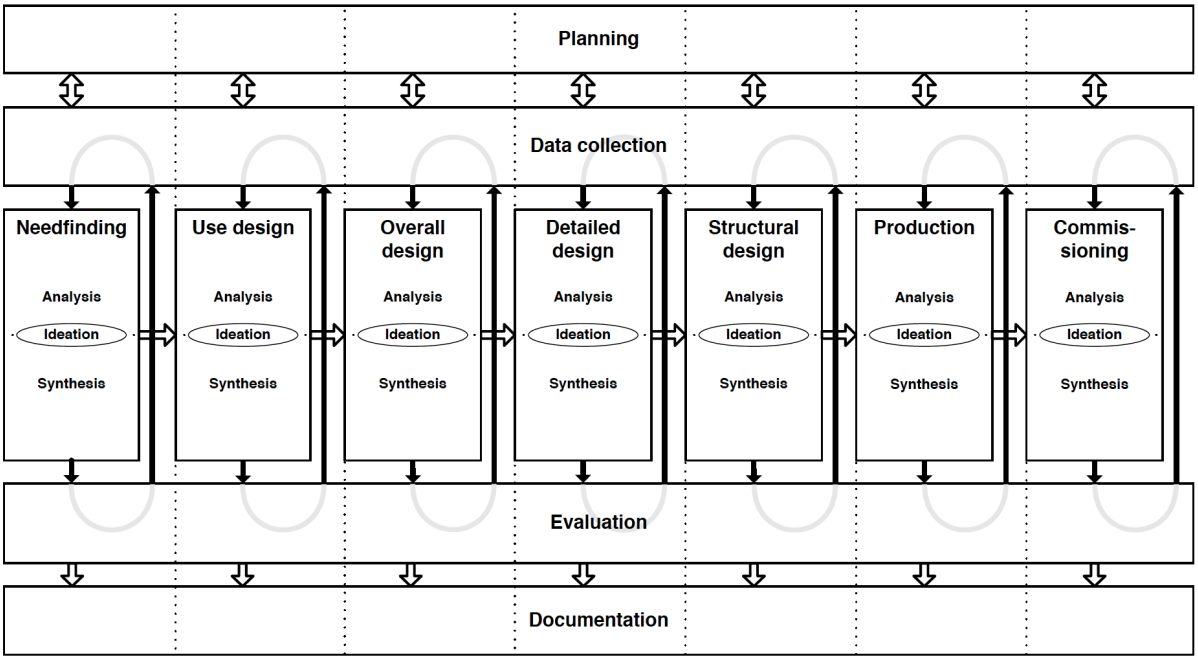


Figure 3.2: The iterative nature of product development by Bligård (2015).

attacks and panic disorder can affect a person's life, Panic attack triggers, Existing methods for dealing with panic attacks, An expert's view on panic attacks and Shame and vulnerability. Furthermore, the results from the literature study, questionnaire survey, interviews and online data collection were used to create personas illustrating the persons suffering from panic attacks. In addition, the data collection served as a basis for creating early ideas on how to solve the problem with a product, and defining what effect the product should have. The process is shown in figure 3.3.

LITERATURE STUDY

A literature study was carried out to gain knowledge of the medical profession's view of the issue. The main literature on which this project relies on are the *Oxford Handbook of Psychiatry* written by David Semple and Roger Smyth, and *Ingen panik, fri från panik och ångestattacker i 10 steg med kognitiv beteendevetenskap (No panic, free from panic and anxiety attacks in 10 steps with cognitive behavioural therapy)* by Per Carlbring and Åsa Hanell. The Oxford Handbook of Psychiatry is a book aimed for physicians and contains medical information as well as definitions on many psychiatric disorders. Ingen

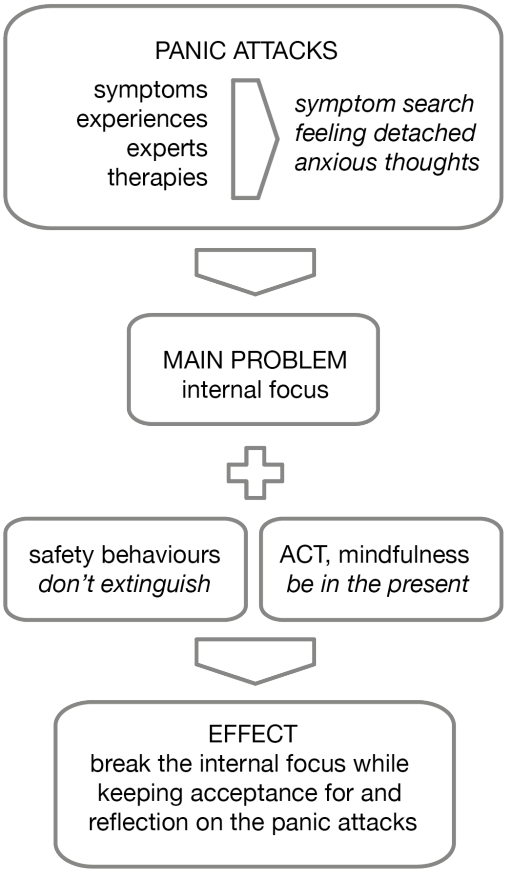


Figure 3.3: The project's process of Part 1: Framing the problem.

panik, on the other hand, is a self-help book aimed to people suffering from panic attacks and panic disorder. Thus, this book contains more concrete advice and information on how one can act and think in order to reduce one's problems with panic attacks and panic disorder.

QUESTIONNAIRE SURVEY

To investigate the perspective of those suffering from the condition, an online questionnaire survey was done. The survey was distributed via Facebook (from the accounts belonging to Sara Yxhage and Hanna Gustafsson) and via the network Svenska Ångestsyndromsällskapet (angest.se, 2016), in English the Swedish Anxiety Disorder Community. The survey had 116 respondents. The survey covered questions on age, gender, how often they experience panic attacks, for how long they have experienced panic attacks, if they have been diagnosed with panic disorder, if they have other anxiety-related disorders, what symptoms they experience during a panic attack and how troublesome they are of the following:

- Palpitations, pounding heart, or rapid heart beats
- Chest pain or discomfort
- Tightness of the chest
- Sweating
- Trembling or shaking
- Tingling or numbness
- Chills or hot flashes
- Sense of shortness of breath
- Smothering sensation
- Dry throat
- Nausea or abdominal distress
- Tunnel vision or blurred vision
- Fear of going crazy
- Fear of losing control
- Thinking that one was dying
- Feeling dizzy, unsteady, light-headed, or faint
- Things felt unreal or like it was a dream
- Feeling of disorientation or confusion
- Feeling of derealisation or depersonalization)

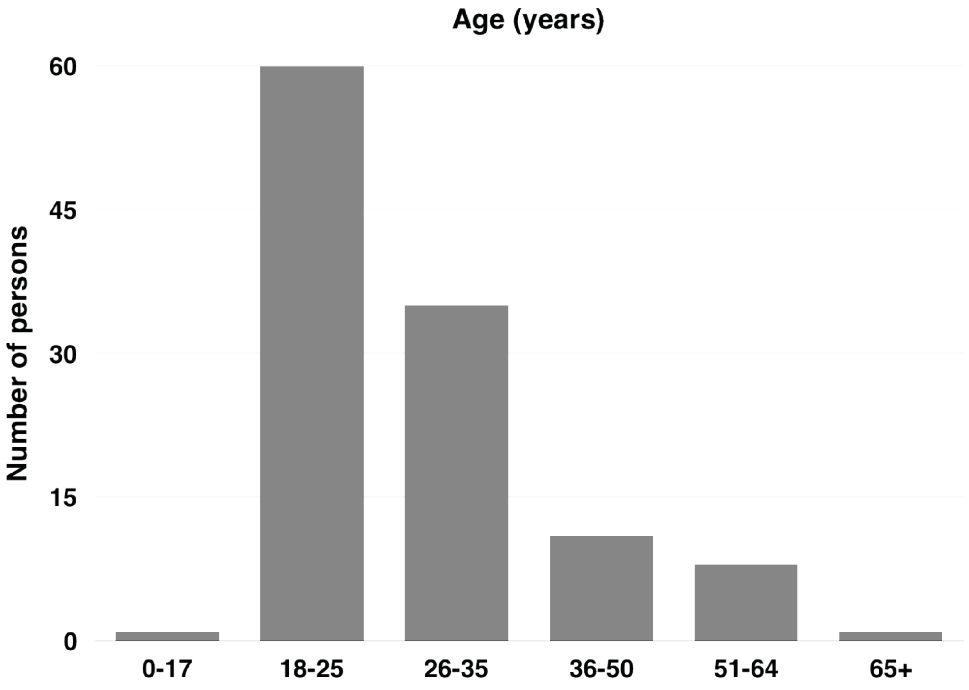
In addition, there were questions on whether they have any panic attack triggers, how they handle panic attacks, how they feel after a panic attack, if they work with alleviating panic attacks in a long-term perspective, if they get any help from the healthcare system as well as if they think that that help has been sufficient, how the panic attacks influences their lives and if the panic attack are hindering them from doing things that they want. Note that the symptoms list featured in the survey does not fully correspond to the medical symptom list in for example Semple and Smyth (2013). This was a conscious decision made in order for us to provide a wider symptom range for the respondents, thus gaining more data from the questionnaire survey.

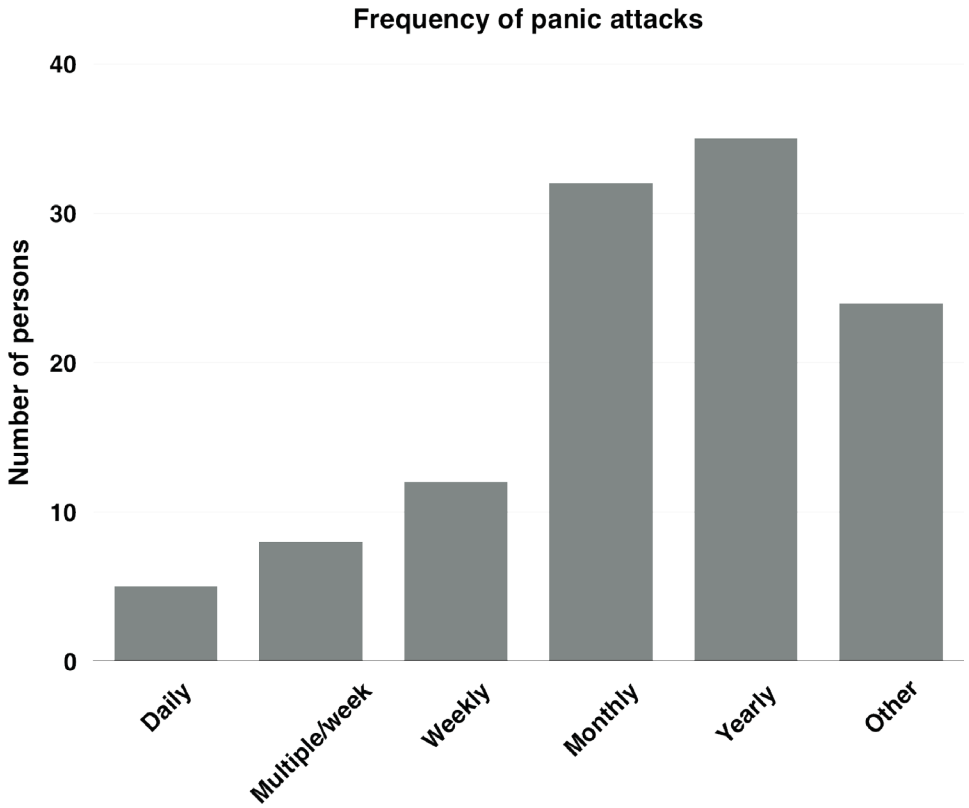
Concerning the respondents, 76% were female and the majority of them were in the age span 18-25. Furthermore, most of the respondents experience panic attacks monthly or a few times a year, and most people have struggled with this issue for a long time. Of the respondents, 83% of the respondents had not been diagnosed with panic disorder, but many had another anxiety disorder diagnosis. Please see figures 3.4 - 3.8 for more information on the respondents to the survey.

To analyse the result, a KJ analysis was made. In this, categories of responses could be identified and common characteristics could be found.

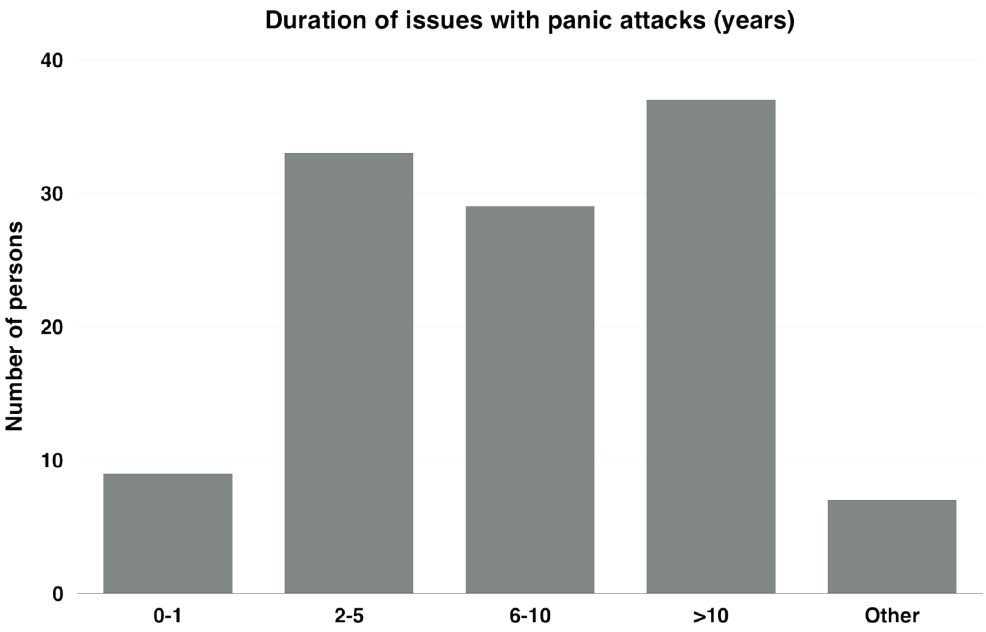
INTERVIEWS WITH PERSONS SUFFERING FROM PANIC ATTACKS

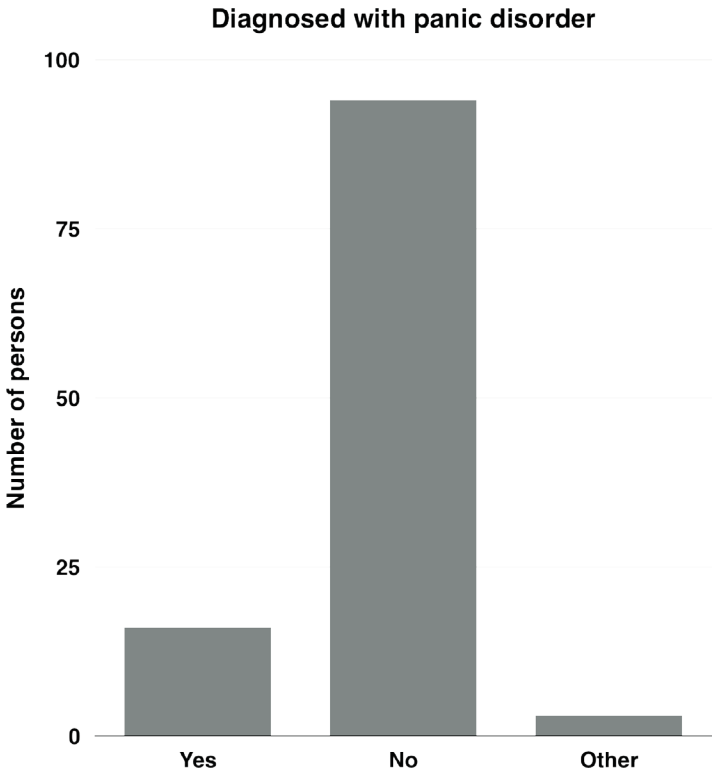
The aim of the interviews was to achieve a deeper understanding of the person behind the panic attack, the underlying reasons for the panic attacks and their subjective experience from having them. 13 persons were interviewed, of which three were men and ten were women, and the interviewees were contacted via information received from the questionnaire survey. A list of the interviewees can be found in *Appendix 2: Participants*. The interviews were semi-structured and the interviewees were asked questions regarding how long they have had their issues, how often they get panic





Figures 3.4, 3.5: Data on the respondents of the online questionnaire survey.





Figures 3.6, 3.7: Data on the respondents of the online questionnaire survey.

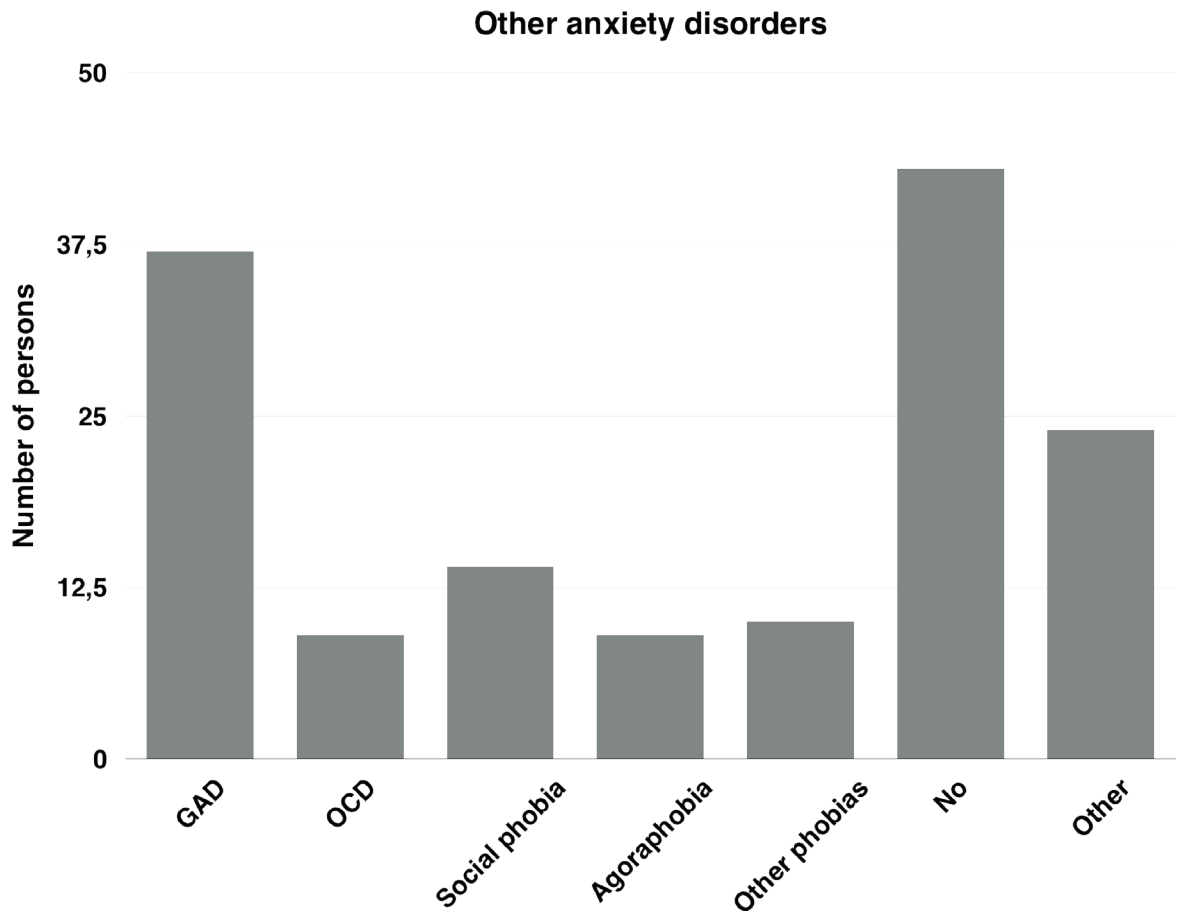


Figure 3.8: Data on the respondents of the online questionnaire survey.

attacks, what symptoms they are experiencing and how they feel, panic attack triggers, strategies for dealing with panic attacks and what help they have gotten from the healthcare system to deal with the panic attacks. Questions regarding how the panic attacks are influencing the interviewees' lives, if they are afraid of the symptoms/condition getting worse, and what they would like to do in their lives if they were not suffering from panic attacks were also asked to some participants. However, these questions stirred up a lot of negative emotions without giving significantly relevant data, thus these questions were later removed from the interview. The interviewees were also asked to draw their *panic attack cycle* onto a piece of paper to illustrate the course of events during a panic attack, creating an illustration of their "user journey".

In order to maintain the participants secrecy, their interviews are not shared in the report, instead five personas tell their stories. None of the personas are based on one single interviewee, but are instead inspired by two or more interviewees with similar problems, experiences and thoughts. The persona format was used as a way of telling a personal story without disclosing details about single interviewees, and to describe different kinds of problems that can cause panic attacks.

INTERVIEWS WITH EXPERTS

Four experts were interviewed, of which three were interviewed face to face and one via a phone. As for the interviews with the persons suffering from panic attacks, the interviews with the experts were semi-structured, giving room for the experts to share their view on the subject and what they believe is important. However, common discussion topics were why people are suffering from panic attacks, what is happening in the mind and body during a panic attack, and how you can become free from panic attacks.

ONLINE DATA COLLECTION

As a complement to the sufferers' personal stories, the experts' opinions and the literature, other input were found. There are many radio shows and videos online on the subject of mental health and for this particular project, Brené Brown's TED-talks and a radio show featuring Åsa Nilsonne proved to be useful sources of information. Furthermore, detailed information on current treatment and therapy methods were found via the online data collection.

PERSONAS

In order to tell the personal stories of the interviewees and respondents of the survey without disclosing sensitive information that could be traced back to a single individual, five personas were created.

EARLY PRODUCT IDEAS

In order to concretise the thoughts and ideas that arose during the literature study, questionnaire survey, interview studies and the online data collection, early concepts ideas were written down.

EFFECT

On the basis of the information gained from the literature study, questionnaire survey, interview studies and the online data collection the effect of the future problem were defined. This included identifying the main problem, who the users are and in which context the product should be used, the values and abilities the product should have, and the product's intended use and lifecycle. Furthermore, the effect also included a list of general needs be fulfilled in order for a product to be effective against panic attacks as well as the specific needs of the personas. Lastly, the directions in which the project could be continued were explored.

CONCLUSION OF PART I: FRAMING THE PROBLEM

To sum up the result from the data collection and the defined effect, a conclusion of the chapter was made. Here it was stated that the product should break the internal focus on thoughts and bodily reactions that the sufferers from panic attacks are experiencing, by including the external world around the user. Furthermore, it is stated that this should be done by using a sensory input.

3.2 PART 2: CONCEPT DEVELOPMENT

The effect defined in and the conclusion of *Part 1: Framing the problem* were used as a basis for the development of concepts. The development process contained components of exploration, ideation and testing. This in order to first achieve a broad perspective of the subject that could serve as a basis for the ideation, and then test the ideas produced in the ideation phase. The process is shown in figure 3.9.

EXPLORATION OF THE SENSES

A collection of sensory inputs were investigated in order to gain knowledge on how, and if, stimulation of the senses could help turn the focus from the inner world to the outer world. This was done by conducting a small test where the sensory inputs' ability to extinguish pain was evaluated. The different sensory inputs' effect on pain was then mapped, and a promising sensory input, namely haptic inputs, was identified.

IDEATION OF HAPTICS

In order to transform the idea of using a haptic input to help a person change focus, to a more defined concept, ideation on the subject of the relationship between the person and the product was done. The ideation was assisted by us, the authors, exploring where on the body a haptic input was appropriate to use. Furthermore, ideation was done on the subject of how the product should behave, i.e., if the

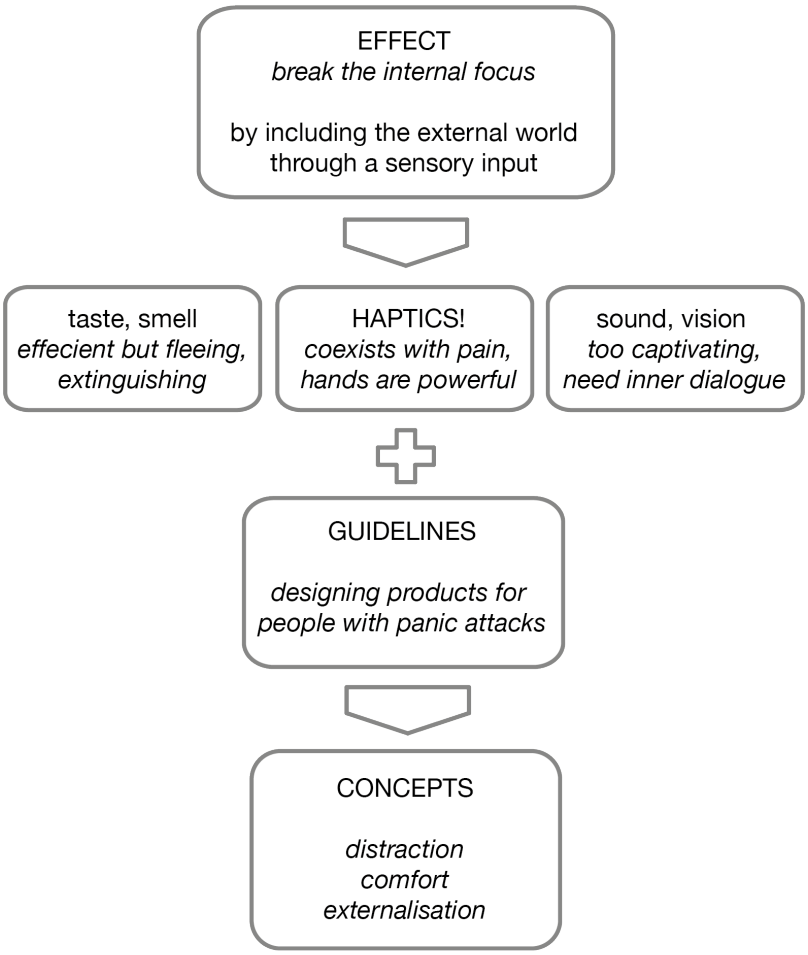


Figure 3.9: The project's process of Part 2: Concept development.

product and/or user should be active or passive. On the basis of the ideas on how the relationship between the product and user should be, as well as an inspiration board showcasing the intended expression and function of the product, concepts were made. The concepts were illustrated as simple models offering the desired properties and functions.

EXPLORATION OF HAPTICS TEST

In order to test the test procedure used for evaluating the concepts as well as to gather ideas for improvements of the concepts and models, a small test with three participants without experience of panic attacks was conducted. The test focused on measuring how safe and secure the haptic input from the models made them feel, as well as investigating whether synergetic effects could be found between different haptic properties. The outcome of the exploration of haptics test was a list of guidelines on how a product should be experienced, as well as guidelines on how a concept against panic attacks should be evaluated.

FILLING THE VOID

In order to finalise the concepts before evaluating them with persons suffering from panic attacks, a new ideation phase was initiated. The guidelines from the exploration of haptics test and prototyping was used to develop concepts, and one participant evaluated the new models on the basis of how safe and secure the models made the participant feel. Furthermore Expert 1 gave her opinions on the concepts.

HAPTIC EVALUATION TESTS

To get an indication on how effective the concepts could be in helping the user break the focus on thoughts and bodily symptoms and include the world around them, as well as evaluating the expressions of the products, several models of each concept were tested by eight persons, whom all have experience of panic attacks. The participants evaluated the models and concept on the basis of how much they liked them in general, where in the panic attack they thought they could be useful as well as how much they thought they could help them in a panic attack. Furthermore, the participants evaluated how they felt while using the concepts, and what characteristics they thought the concepts had by the help of semantic scales. The outcome of the haptic evaluation test was strengths and weaknesses of the concepts as well as an indication on what versions of the three concepts that seem the most promising.

THE FINAL CONCEPTS

In order to explain the concepts and the thoughts behind them in greater detail, a description of three of the concepts was made on the basis of what effect they have, how they are used, and how they can be personalised. A comparison between the listed needs and the concepts are also featured. Furthermore, stories about how the personas can use the concepts were made to illustrate how the concepts can help different persons with different problems.

PART 1

Framing the problem

In the *Oxford Handbook of Psychiatry*, a panic attack is defined as a

"period of intense fear characterized by a constellation of symptoms that develop rapidly, reach a peak of intensity in about 10 min, and generally do not last longer than 20-30 min (rarely over 1 hr). Attacks may be either spontaneous ('out of the blue') or situational (usually where attacks have occurred previously). Sometimes attacks may occur during sleep (nocturnal panic attacks) and rarely, physiological symptoms of anxiety may occur without the psychological component (non-fearful panic attacks)"
(Semple and Smyth, 2013: 358)

Panic disorder is defined as a condition where panic attacks are reoccurring with a frequency varying from several attacks a day to a few a year. Panic disorder is also often associated with a worry about having another attack or consequences of an attack. This can lead to phobic avoidance of situations or places and can result in a significant behaviour change (Semple and Smyth, 2013).

The experience of a panic attack can be excruciating with uncomfortable physical symptoms such as a racing heart, difficulty breathing, chest pain and trembling, as well as mental ones such as a fear of losing control or going crazy and fear of dying (Semple and Smyth, 2013).

The medical definition of panic attacks is quite straightforward, but what we aimed to do during this section of our work was to find out who the persons behind the medical description are, their emotions, feelings and experiences of panic attacks and how their stories relate to the medical point of view, and the stories of the therapists that helps them. Having a basis in the subjective experience enables the process of defining the effect a future product should have in order to continue the development it. *Part 1: Framing the problem* ends with the definition of what effect a future product should have.

Part 1: Framing the problem contains the following chapters:

AIM OF PART 1: FRAMING THE PROBLEM

The aim of the investigation phase of the project, called *Part 1: Framing the problem*, was to gain a deep understanding of how panic attacks are experienced by the persons suffering from them, as well as gain an understanding for how the medical profession attend to the area of panic attacks. The investigation ended with defining the effect a future product should have in order for it to make a difference for the persons suffering from panic attacks.

METHOD OF PART 1: FRAMING THE PROBLEM

By studying literature on the subject of panic attacks, gathering the stories of those who suffer from panic attacks, talking to the experts who help persons dealing with panic attacks and finding information online, a wider understanding for the issue could be formed.

The following chapters in *Part 1: Framing the problem* concern themes that were discovered during the investigation. The results are presented with an integration of analysis and reflection, focusing on the possibilities for productification. The findings are divided into sections based on the findings being symptoms, how panic attacks affect a person's life, triggers, methods for help today, the view of different experts and the components of shame and vulnerability in the experience of panic attacks. In the text, quotations from interviews and from a questionnaire study are presented and they are intentionally written without an identity in order to keep the anonymity of the interviewees. The stories by people suffering from panic attacks were made into personas, describing different aspects of panic attacks. Lastly, the information gathered in *Part 1: Framing the problem* was used as a basis for creating early ideas on how to make a product for panic attacks, and to define the effect of a future product.

4. THE SYMPTOMS AND EXPERIENCES OF PANIC ATTACKS

A panic attack is described as an immediate and intense surge of fear with a constellation of symptoms that develop rapidly and often peak within ten minutes (Semple and Smyth, 2013). What are the symptoms and what does it feel like for those experiencing them? In this chapter the symptoms of a panic attack are described both from a medical perspective, and from the view of the persons suffering from the condition. To read more examples of how panic attacks can be experienced, please see *Chapter 10: The faces and phases of panic attacks.*

4.1 SYMPTOMS DESCRIBED IN MEDICAL LITERATURE

According to the *Oxford Handbook of Psychiatry*, the symptoms of a panic attack can vary, but some are more common than others (Semple and Smyth, 2013). The symptoms described by Semple and Smyth (2013: 359), listed in order of frequency (the most common first) show that panic attacks can be felt in the entire body, which is also illustrated in figure 4.1:

- *"Palpitations, pounding heart, or accelerated heart rate.*
- *Sweating.*
- *Trembling or shaking.*
- *Sense of shortness of breath or smothering.*
- *Feeling of choking or difficulties swallowing.*
- *Chest pain or discomfort*
- *Nausea or abdominal distress*
- *Feeling dizzy, unsteady, lightheaded, or faint.*
- *Derealisation or depersonalization (feeling detached from oneself or one's surroundings).*
- *Fear of losing control or going crazy.*
- *Fear of dying (angor animus).*
- *Numbness or tingling sensations (paraesthesia).*
- *Chills or hot flashes."*

Figure 4.1: Illustrates how the panic attack can take over the whole body. (thenounproject.com, 2016)

4.2 SYMPTOMS DESCRIBED BY THE SUFFERERS

The subjective experience of different symptoms was gained as insights from the questionnaire survey and interviews. It differs some from what is described in the literature. To see a summary of the responses from the survey, please see *Appendix 1: Summary of questionnaire survey*. A list of the interviewees can be found *Appendix 2: Participants.*

SYMPTOMS FROM THE SURVEY

In the online questionnaire survey, the respondents were asked to fill in what symptoms they had experienced and how troublesome they were in order to see if there is a gap between the medical literature and the subjective experience. The results were scattered, but the most common and troublesome as well as the least common and least problematic symptoms could be identified.

Most common and most troublesome symptoms were:

- *Palpitations, pounding heart, or accelerated heart rate.*
- *A sense of heaviness on the chest.*
- *Trembling or shaking.*
- *Shortness of breath.*
- *A sense of losing control.*

These symptoms were experienced as troublesome by more than half of the respondents and the majority found them very or extremely troublesome.

The least common and least troublesome symptoms were:

- *Numbness or tingling sensations.*
- *Chills or hot flashes.*
- *Dry throat.*

In this case, more than half of the respondents answered that they had never experienced these symptoms or that they did not find them troublesome at all.

Furthermore, the respondents also described how they feel after a panic attack. One recurring statement was the people feel very tired and one person describes that it feels like:

"As if I have run a marathon, or not been sleeping for two days"

Some also stated that they feel sad, ashamed, hopeless, empty, anxious, vulnerable, nauseous or dizzy, or let down. Others are feeling relieved, and relatively good.

ONE POPULAR BELIEF: FEAR OF DYING

One popular belief is the emphasis on fear of dying in a panic attack, but according to the medical literature, it is among the less common symptoms and the same was found in the survey. Fear of dying may be implied in other symptoms, such as thinking one is having a heart attack when the heart is racing, or an extremely uncomfortable feeling that something bad is going to happen. But the fear of dying in itself is not reported to such a high degree as one might think from the popular belief. Calmclinic.com (2016) gives an example of how a panic attack may be experienced:

"Your heartbeat races. You feel sharp pains in your chest. The room appears to be spinning out of control. You don't know what's going on, but you know that something bad is happening. It feels like a heart attack, and you feel doom, as though the world is about to end. You feel like you're about to die. Then all of the sudden nothing happens, the fear generally starts to fade away (leaving you feeling drained), and you're left wondering whether something is wrong with your health. What you may have had was a panic attack, and the fear of death is a symptom of the attack."

It is not uncommon to think that one is dying the first time one is experiencing a panic attack, as it might come from out of the blue and the intense feeling takes over completely, leaving one without control. Some reported that after understanding that it is "just" a panic attack and that they were not in fact dying,

they do not think they are dying in subsequent panic attacks. For others, the fear of dying can occur in every panic attack. For some, the panic is so intense that they desperately try to explain what is happening with rational and irrational thoughts, thinking that they want to die in order for it to end. Others yet, do not experience the symptom of feeling like they are dying anytime.

SYMPTOMS FROM THE INTERVIEWS

Inspired by the use of user journeys, the interviewees were asked to draw a map of their experience of panic attacks, called a *panic attack cycle*. The panic attack cycles from the 13 interviews shared common characteristics, please see figure 4.2.

Phase 1: pre panic attack, is the phase before the panic attack and the person usually feels quite normal, or sometimes in a slightly more anxious mood than usual. Then the first signs of a panic attack start to appear (phase 2: symptom scare). This can be physical symptoms such as trouble breathing or heart palpitations, or psychological symptoms such as thoughts that things could go wrong in the situation:

"What if I get trapped in this bus"?
"What if I do something wrong in this situation, what will people think of me then?"
"What if I can't handle the situation?"

In many cases, the person manages to calm themselves down temporarily, and in some cases the person manages to fend the panic attack. However, when calming oneself down does not do the trick, the panic strikes with full force (phase 3: panic attack) and the per-

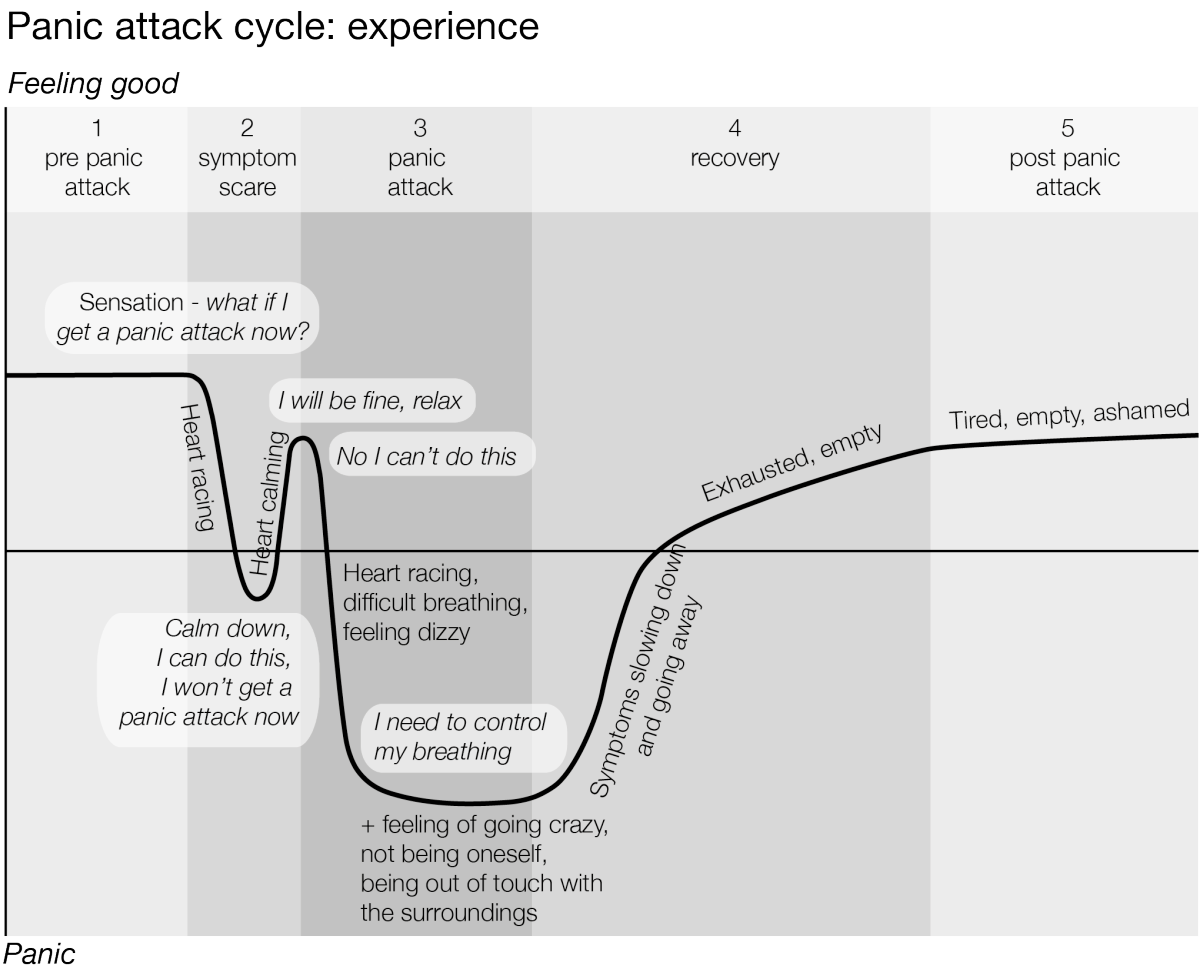


Figure 4.2: The experience of panic attack according to the interviewees.

son quickly finds themselves in a state of complete panic and anxiety and the symptoms become intense. Some people understand what is about to happen when the first symptoms starts to appear, but many others do not know what is happening until after they have hit rock bottom. The duration of the intense panic phase varies from a couple of minutes to up to an hour. For those who experience intense and long panic attacks, the panic can come in waves, easing for a few minutes in order for the body to recover, and then going back to full panic. The panic attack then wears off and the person is left very tired and drained of energy (phase 4: recovery and phase 5: post panic attack).

4.3 REFLECTIONS

The literature and the accounts from people's experience of panic attacks differ, some symptoms that are less common according to the literature give large personal suffering according to the subjective accounts. The fears of panic attacks can be divided into three different levels: *losing control of the body, losing control of the mind and losing face.*

DISCREPANCIES

The descriptions of symptoms related to panic attacks and the severity of them, are fairly similar when examining the medical literature and the responses from the survey and interviews. Both bring up an accelerated heart rate, trembling and shortness of breath as common symptoms. However, there are some discrepancies between the medical literature and the stories of the persons suffering from the condition. In the medical literature, mental symptoms such as a fear of losing control is far down on the list of common symptoms, while this is experienced as a major issue by the ones answering the survey and the participants in the interviews. This may have to do with the fact that the persons seeking emergency care for their panic attack are not seldom the ones experiencing physical symptoms resembling a heart attack, according to Anders Lycksell, medical doctor. This may create an overrepresentation of individuals with these symptoms in the medical statistics. Furthermore, one expert (later referred to as expert 1) interviewed at Svenska Ångestsyndromsällskapet (the Swedish Anxiety Disorder Society), ÅSS, stated that we might have been in contact with persons that have other problems than just panic attacks, e.g., social phobia or agoraphobia which might lead to a distorted result in respect to the symptoms. To read more about expert 1 and her thoughts, please see *Chapter 8: An expert's view on panic attacks*.

One discrepancy between the popular belief and the medical literature and the reports from the sufferers is the focus on the fear of dying. Neither the medical literature, nor the reports from the sufferers focus on the fear of dying, whereas the popular belief is that it is common. A fear of dying may be a result of thoughts that the heart is racing and it must be a heart attack or a desperate explanation of what is happening.

Moreover, there is a discrepancy between the findings from the survey and the interviews regarding what symptoms the respondents focus on. In the survey there was a focus on the symptoms during the actual attack (phase 3: panic attack in figure 4.2), probably due to the questions asked in the survey, while the persons interviewed discussed symptoms in the phase before and after the panic attack (phase 2: symptom scare and phase 4p: recovery in figure 4.2) to a larger extent. The wider symptom spectra opened

our eyes to focusing not just on the panic attack itself, but also the period of time immediately before and after an attack.

THREE FEARS OF LOSING CONTROL

There seemed to be three levels of fears of losing control in the panic attack. One is *losing control of the body*, manifested by the painful physical symptoms leading one to fear that one is about to die. The other is the fear of *losing control of the mind*, shown by people being scared of going crazy and never becoming themselves again. The third is the fear of *losing face*, illustrated by symptoms related to a fear of doing something embarrassing and of others seeing that one is having a panic attack. Some people talked about experiencing all the types of fears, while others only mentioned experiencing some.

PRODUCTIFICATION

As shown by the responses to the survey and the interviews, the symptoms of panic attacks are crippling and if a product could do something about the symptoms, it could be beneficial for the persons suffering from panic attacks.

In addition, the timeline perspective of the phases of a panic attack lead us to think about products preventing the attack from ever happening. What if a product could stop the attack already in the symptom scare phase by for example showing the person that the heart is not really racing as fast as they think? The results from the panic attack cycles also opened our eyes to the problems after a panic attack. Maybe the product should focus on helping a person feel less lonely and empty after the attack, and help them to understand their attacks in a better way.

As told by the persons suffering from panic attacks, there are many phases of the panic attack that are painful or uncomfortable, both on a physical and mental level. Thus,

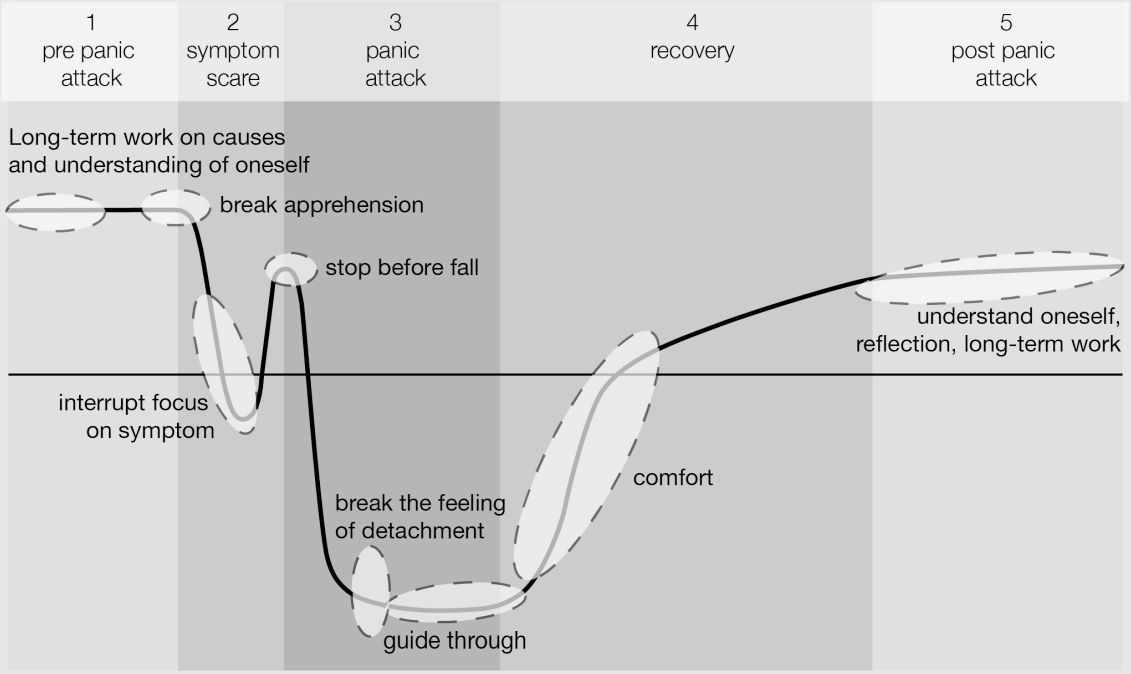


Figure 4.3: Possible ways for products to help in the different phases of panic attacks.

a product could be used in many phases of the panic attack. However, the product would probably need to have different focuses during different phases of the attack (please see figure 4.3). In the beginning and the end of the panic attack a product could be helping

the user to gain an understanding for their reactions. Reflections upon the panic attack may also be useful during those times. In the recovery phase, comfort is more suitable. Furthermore, a focus of interrupting the symptoms can be important in the symptom scare phase, and breaking the feeling of derealisation and depersonalisation can be relevant in the panic attack phase. Here, guidance of how to get through the attack could also be of help.

All in all, one can view it as a need for the person to first *snap out* of the focus on symptoms as well as the feelings of derealisation and depersonalisation, and then get help to *calm down*.

But is it that simple…?

5. HOW PANIC ATTACKS AND PANIC DISORDER CAN AFFECT A PERSON'S LIFE

As seen in the previous chapter, the symptoms of a panic attack are troublesome. However, the symptoms during the attack do not tell the whole story. Many people's lives are affected far beyond the moment of the panic attack itself, making it important to consider product solutions that focus on more than symptomatic relief. This chapter is about the larger view of how panic attacks can affect a person's life.

5.1 THE IMPACT ON LIFE FROM THE LITERATURE:

PANIC DISORDER AND AVOIDANT BEHAVIOUR

According to Carlbring and Hanell (2011), persons with panic disorder and/or agoraphobia often have fears concerning catastrophic physical consequences and catastrophic social or behavioural consequences when being nervous or frightened. This can be manifested by among other things being afraid of throwing up, fainting, acting crazy, hurting someone, having a heart attack or choking to death. The thoughts of these catastrophic events that one fears could happen during a panic attack can be excruciating. Furthermore, the fear of these events can make the person so worried about having another panic attack that the worry actually causes a panic attack. Thus, the more one worries about having a panic attack and its consequences, the more the risk of getting a panic attack is increased. When the fear of new panic attacks sets in, the person becomes more focused on possible dangers and these feelings can be very overwhelming (Carlbring and Hanell, 2011).

Another common issue when having panic disorder is having agoraphobic thoughts and behaviours. Agoraphobia is having a fear or avoidance connected to specific situations because the individual thinks that escape might be difficult. In connection to panic disorder, it means that one, due to the fear of having a panic attack, starts avoiding certain situations. These can be situation like the theatre, restaurants and elevators. Panic disorder can cause melancholia or depression and sometimes this component can come to dominate the problem a person has (Carlbring and Hanell, 2011).

Panic disorder: A condition where panic attacks are recurring with a frequency varying form several attacks a day to a few a year. Panic disorder is also often associated with a worry about having another attack or consequences of an attack.

Avoidant behaviour: If a person knows what situations that can trigger anxiety and/or panic attacks, they often start to avoid these situations. Thus, a person who feels anxious and gets panic attacks in many situations and that is resorting to avoidant behaviour can feel very limited in what they can do.

5.2 THE IMPACT ON LIFE FROM THE SURVEY AND INTERVIEWS:

FEELING LIMITED, CONTROL AND SHAME

Both the survey and the interviews showed that many feel limited due to their panic attacks. The interviews gave a chance to get a fuller subjective view of how panic attacks can influence a person's life and explained that avoidant behaviour as well as being ashamed of one's condition is common.

A SENSE OF FEELING LIMITED

For some of the respondents to the survey, the panic attacks have never influenced their lives to any great extent and some have managed to deal with the problem in such a way that it does not affect their lives as much as it had before. For example, one person writes:

"I have a hard time doing the things that I want to do, like spending time with friends. I also lock myself in the house for long periods of time. However, after going through behavioural therapy I have learned what my risk situations are and I have learned what to do to reduce my problems. Today, I still get panic attacks, but I don't let them control my life to the extent I did before."

Others are being more affected by their panic attacks. Many people avoid situations that might trigger an attack or situations where an attack would be extra difficult or embarrassing.

"I spend a lot of time at home. I don't dare to travel by tram or bus with my daughter. If I go, I rather do it by myself, otherwise I go by bike."

Others feel limited, both in terms of what they can do on their spare time, at work or in life in general.

"I can't manage my household or have contact with other people. It keeps me from having a social life and to plan my life in a long term perspective."

Sometimes people feel so limited that they have considered committing suicide. One person writes:

"It [the panic attack] is making me so disabled that I consider ending my life on a daily basis."

Overall, a lot of people state that they *"just want to be free"* from the panic that is holding them in its chains, inhibiting them from doing what they want.

This resonated in the interviews as well, where many interviewees stated that they avoid certain things in life due to the fear of getting panic attacks and what might happen. Some have stopped travelling, some avoid public places where they might feel trapped and some refrain from having children. Overall, the panic attacks are limiting people from doing things they want to do, and the fear is taking over a large part of their lives.

BEING IN CONTROL VERSUS SAFETY AND SECURITY:

SAFETY BEHAVIOURS

Many people suffering from panic attacks feel a sense of not being in control of their lives and a lack of feeling safe and secure (Swedish: trygghet). Many of the interviewees also seem to confuse the two terms. A strive for increasing safety and security in their lives results in an increased need for having control. They try to gain control by preparing for every situation they might face and by avoiding situations where they cannot have full control. Many people also feel a lot of anxiety when thinking about uncertainties in the future instead of thinking of it as exciting. For example one participant stated that she, when visiting a new place, had to look up where bathrooms (she had a fear of incontinence) were in order to feel secure, and that the constant fear of going to a place without a bathroom killed her joy

of travelling. This meant that she did not feel excited to go on trips, but rather very anxious.

The need of control is also manifested in safety behaviours in some, i.e., that they have a behaviour that they resort to or the need of a person or an object in order to avoid panic attacks and to feel safe and secure.

> ***Safety behaviour***: A safety behaviour is a behaviour that is seemingly helping a person to handle a hard or frightening situation, but that maintain the focus on and fuel fear of the real or imaginary threat. In addition to safety behaviours there can be a need for ***safety objects*** and ***safety persons***. These two things make the person feel better, but do not solve the core issue of the fear.

Thus, feeling the need of maintaining control by having this person, object or behaviour available can be very limiting. For example, one of the interviewees stated that she always sits on the far edge of the bench row in the cinema or lecture room in order to have a fast exit if the panic is approaching. If she cannot manage to get a seat in such a spot she starts to have catastrophic thoughts regarding what will happen if she were to have a panic attack and what people would think about her. Another interviewee has safety persons that she relies on in order to feel safe and secure, and when being far from them or when she is not able to reach them, she feels very unsafe and insecure which can trigger a panic attack.

In conclusion, the persons lacking a basic feeling of being safe and secure seem to compensate by trying to control situations. Instead of trusting that they will be able to handle a future unknown situation, they resort to trying to control it.

DOING SOMETHING USEFUL BY WORRYING

Anxious thoughts are often future oriented, but some participants mentioned that it is difficult to detect the destructive thoughts from the constructive. There is a difference between continual worrying about the future and making preparations. Thinking about the future (worrying or preparing) can be experienced as performing something meaningful. One interviewee mentioned:

"I feel as if I am doing something useful by worrying about something, it is as if I am preparing for what could happen."

Another participant mentioned that he sometimes finds himself tormenting himself with bad thoughts and he questions why he keeps doing it, as it can be exhausting. He said that he can get stuck in bad thought patterns and afterwards realise it. He said that it is as if he thinks that he deserves to feel bad and that by sometimes feeling bad, he can appreciate when he is feeling good.

SHAME, GUILT AND LONELINESS

Many people are ashamed of their panic attacks and do not want their acquaintances to know about them having issues since they do not want to be perceived as weak or as being mentally ill. However, some interviewees who have suffered for a long time stated that they were starting to open up about their problems and feel that if their friends cannot accept it, they are not worth being friends with.

Since many people are not open about their condition there is a lack of knowledge about how other people are experiencing panic attacks. There is a large focus on physical symptoms in the literature and on being afraid of dying. People with other, often embarrassing, symptoms such as being afraid of peeing their pants or throwing up in the company of others, or hurting or even killing themselves or others during a panic attack can therefore feel very lonely and weird. This became obvious when information from other people's responses was shared during interviews. The interviewees were very surprised to hear that other people were also suffering from the same non-conforming symptom, and they said that

they appreciated this knowledge, it helped them feel less strange, embarrassed and alone in their suffering.

A lot of people also feel guilty about their condition, and feel like they are becoming a burden to the people around them when they are not feeling well or having a panic attack. This can cause people to withdraw from social situations, and feel even lonelier.

5.3 REFLECTION: PRODUCTIFICATION

When investigating how panic attacks and panic disorder can affect one's life, it became clear that the panic attack and its symptoms, in themselves, are not the largest issue for many people. It is instead the immense feeling of being limited in one's life, being prohibited from doing what one wants to do from the fear of the consequences of a panic attack in a certain situation. Thus, a product aimed against panic attacks should maybe focus on reducing the feelings of shame and guilt, and make people dare to enter a situation without being in full control. If this could be done, the fear of having a panic attack in an unsafe situation might be reduced, and the bad spiral of fearing panic attacks that in turn is causing panic attacks might be broken.

But is it that simple…?

6. PANIC ATTACK TRIGGERS

It is obvious that the experience of panic attacks can be excruciating and can affect the person's entire life. Maybe there is a way of avoiding this all together? What can trigger a panic attack and is there anything that can be done against that?

This chapter describes what the respondents to the survey and the interviewees mentioned as triggers as well as what the literature mentions.

6.1 TRIGGERS FROM THE LITERATURE

According to the literature, catastrophizing the future can create a mind-set that triggers panic attacks. Also other diagnoses, such as social phobia, can trigger panic attacks.

INTERNAL CATASTROPHIC FOCUS CREATES FUTURE ORIENTED SELF-CENTRING

According to Carlbring and Hanell (2011), a common problem for people with recurring panic attacks is the development of a fear for normal bodily sensations. If a person experiences uncomfortable heart symptoms, making them believe they will die, during a panic attack, the person can develop a fear for getting a heart attack in the future. This in turn can make them start focusing on their heart rate more than normal and a normal bodily sensation can then easily be over interpreted into a symptom of a heart attack. *"Isn't my heart beating very hard now? This can't be normal. What if I am having a heart attack? And now it's beating even faster, this must be heart attack."* The stressful thoughts can fuel a panic attack. According to a cognitive model of panic attacks by David Clark (see figure 6.1), people who suffer from panic disorder start to perceive their bodily symptoms as threats (mentalheatlhce.com, 2016).

They may have experienced a panic attack without knowing the cause, and then they start to fear the symptoms or the panic attack itself. This causes them to have a heightened apprehension for bodily symptoms and interpret a normal reaction into something catastrophic (faster heart beat = heart attack), which means that the trigger for their panic attacks can go from external to internal. Since the mind cannot find an external threat as an explanation for the panic attack, an internal, bodily reason is used to explain the panic attack and so, the person starts fearing their own, normal bodily reactions. Carlbring and Hanell (2011), further state that the focus on the bodily sensations can make the person keep track of their

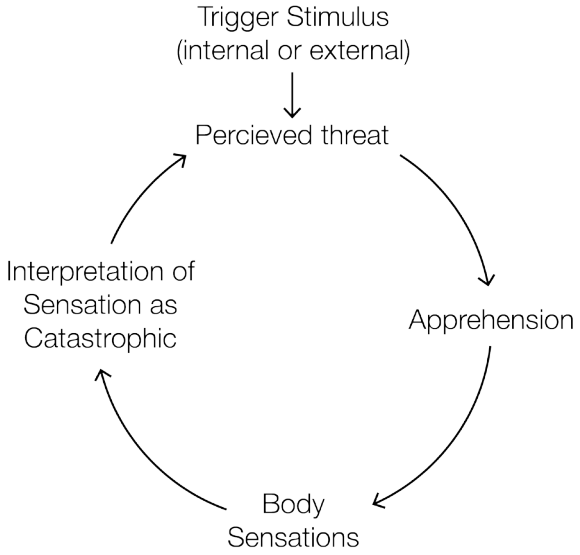


Figure 6.1: A cognitive model of panic attacks by David Clark (mentalheatlhce.com, 2016).

bodily reactions, especially keeping track of the fight-or-flight symptoms that in turn can make the person discover more symptoms that create worry. In this way, the panic disorder develops from fearing one or several symptoms into fearing new or additional symptoms.

Anxious thoughts are often of a worrying kind about a future event, often with a focus on a catastrophic outcome. The person is not focusing on the present, but is worrying about something that will happen in the future. According to researchers at Umeå University, there is a link between the experience of time and mental health where persons with depressive thoughts focus on the past, how things have been and that they see no future whereas persons with anxious thoughts have a fearful focus on the future (sverigesradio.se, 2009).

In conclusion, being vigilant and searching for symptoms of panic attacks as well as having anxious thoughts makes a person having a lot of focus internally, instead of having a balance between the internal focus and taking in the external world. The same goes with the anxious thoughts, they are focusing on a catastrophic future and the person is not in the present. Thus, focusing internally and having worrying, anxious thoughts makes the person self-centring.

OTHER DISORDERS CAUSING PANIC ATTACKS

Panic attacks have comorbidity with other conditions such as agoraphobia, depressive disorder, other anxiety, social phobia, OCD and bipolar affective disorder (Semple and Smyth, 2013). Panic attacks can occur in other anxiety disorders, and panic disorder is given as a diagnosis when the symptoms are not better explained with another mental disorder (American Psychiatric Association, 2013). Common anxiety disorders that can trigger panic attacks are:

- ***Social phobia***: fear connected to social situations such as participating in social events or speaking in public. The individual fears being criticized or judged by the others (Carlbring and Hanell, 2011).

- ***Agoraphobia***: fear or avoidance connected to specific situations because the individual thinks that escape might be difficult or help might not be available in the event of the development of panic-like symptoms or other incapacitating or embarrassing symptoms such as incontinence. The situations that the person fears or avoids are e.g. using public transportation, being in open or enclosed places, standing in line or being in a crowd (American Psychiatric Association, 2013). ***Generalised anxiety disorder (GAD)***: the person has excessive anxiety and worry (American Psychiatric Association, 2013). The person is anxious about things that will happen, what others will think of them and how things will go. The worry is rarely strong enough to give panic attacks; it is more of a constant worry that the person feels most of the time (Carlbring and Hanell, 2011).

- ***Posttraumatic stress disorder (PTSD)***: a very difficult stress reaction that generally comes from traumatic events such as war, torture, rape or being witness to a difficult accident. The individual can get panic attacks, but they are often a reaction to memories or other things that remind them of the horrors they have suffered (Carlbring and Hanell, 2011).

- ***Physical diseases***: physical diseases such as hypoglycaemia, graves' disease, disturbances in the metabolism, some neurological diseases, some heart diseases and substance abuse (American Psychiatric Association, 2013).

6.2 TRIGGERS FROM THE SURVEY:

NOT BEING ENOUGH AND LACK OF CONTROL

In the survey it became apparent that panic attacks do not have one single trigger, instead, the triggers are different for each individual. However, a common trigger for panic attacks is a sense of not "being enough" or not "doing enough". One person writes:

"Different types of mandatory and/or inevitable social situations. When I went to high school it was among other things physical education class, and in the later stages of my life it has mostly been my parents ultimatums and 'threats' of severe consequences as a reaction to my reoccurring thoughtless actions (usually due to laziness). Another thing that sometimes triggers (panic attacks) is the thought of dating."

Others write that a lack of control or where the outcome is uncertain trigger panic attacks:

"Situations that I cannot control. Snowstorm when I'm going to get home from work. When a person does not arrive at the expected time. Parties. Traffic situations. Opening mail. Phone calls. Travel."

In addition, performance anxiety, unexpected bad news, stress, a sense of being trapped, sleep deprivation, a fear of being subject to ridicule, being left out or betrayed, and thinking about upcoming decisions can trigger panic attacks according to the respondents of the survey.

6.3 TRIGGERS FROM THE INTERVIEWS:

HIGH DEMANDS, BEING TRAPPED AND EXHAUSTION DISORDER

Even though many of the interviewees' stories differed in terms reasons behind their panic attacks, some common features could be identified.

DEMANDS FROM ONESELF OR FROM OTHERS

Many people stated that their anxiety level is increased when they are having high demands on themselves or when they feel that others have high demands on them. Many of the interviewees are ambitious high achievers and have a hard time accepting the feeling of not being able to meet the expectations from themselves or others.

PLACES FROM WHERE ONE CANNOT ESCAPE

Due to shame of one's condition, or a more general claustrophobic feeling, many people feel very bad in places from where it is not easy to escape in case of a panic attack. This can be the cinema, buses, trams or trains and other places where escape is hard or when an exit would cause a lot of focus on the person, pointing to agoraphobic tendencies.

EXHAUSTION DISORDER

People who suffer from exhaustion disorder have overstrained their psychological resources and therefore panic attacks can start to occur, or occur more frequently during this time in their life. When the resources are emptied it does not take much to push one over the edge.

6.4 REFLECTION: PRODUCTIFICATION

There are many things triggering panic attacks, and this seems to be largely dependent on if the person has additional disorders such as agoraphobia. Thus, attacking certain situations with a product is a narrow path to walk down. However, the idea of internal focus triggering and maintaining a panic attack seems to be a common characteristic of all panic attacks, and thus a product breaking such a behaviour has good potential.

But what are the strategies that are used today…?

7. EXISTING METHODS FOR DEALING WITH PANIC ATTACKS

Several medicines are prescribed for panic attacks: SSRI, SNRI, BDZ, TCA and MAOI (Semple and Smyth, 2013). Also, therapies such as cognitive behavioural therapy and acceptance commitment therapy as well as mindfulness are used for helping patients dealing with panic attacks or curing them (1177.se, 2012a). In addition, a number of self-help books and apps exist on the subject; some apps focus on mindfulness and others on fighting panic attacks. Can any of these methods help the person from the negative self-centring?

7.1 EXISTING HELP FROM THE LITERATURE:

CBT, ACT AND MINDFULNESS

There is a large focus on cognitive behavioural therapy (CBT) in the literature as a way of dealing with panic attacks. The person explores their fears and gradually exposes themselves to it. ACT, acceptance and commitment therapy, on the other hand, work with how one relates to one's feelings. Mindfulness focuses on being in the present. The methods are presented below.

CBT - COGNITIVE BEHAVIOURAL THERAPY

The information in the following section about CBT has been retrieved from 1177.se (2012a). 1177, Vårdguiden, is a Swedish national healthcare guide and behind it is the Swedish healthcare system with all its counties and regions in collaboration. According to 1177.se (2012a), CBT stands for cognitive behavioural therapy and has its basis in the interplay between the individual and their surroundings as well as their thoughts, behaviours and feelings. CBT aims to make the patient feel and function better by changing the person's behaviour and the way they perceive and interpret themselves and their surroundings.

In CBT, there is a focus on the past as well as the present and the future. An understanding for how one's problems have occurred is important, but in CBT, it is also important to look to the future and work actively to achieve a change in the patient's life. A large effort is put into developing new ways of dealing with the problems in order to make them have less influence over the patient's life or make them disappear.

Cognitive behaviour therapy is as the name suggests an integration of two therapies, namely cognitive therapy and behavioural therapy. In CBT, the term behaviour means something that can be changed through learning and includes conscious actions, conscious and unconscious as well as physiological reactions, habits, emotions and sometimes thoughts. Behavioural therapy has its basis in theories on how humans consciously or unconsciously learn from, and are influenced by, their surroundings and by their own actions. This includes learning how to drive a car as well as how one has learned to interact with other people, how to react to emotions or strategies for dealing with for example disappointments. The starting point for the behav-

ioural therapy is often a behavioural analysis of the situations the patient finds difficult. This includes studying how previous learning can contribute to the problems, and how one can learn to deal with the situations in a better way. Learning new ways of managing problems often involve exposure therapy, which means learning how to approach situations that has previously been avoided, step-by-step. By doing this, the patient can re-learn how to react, and situations that were previously causing fear or anxiety can become neutral. Other methods are model-learning, which is a form of role-play with the therapist where the patient can learn new behaviours, behavioural activation, where depressed and passive patients are helped to increase the level of activation, chain analysis, where the patient analyses the chain of events leading to a difficult situation and finding ways of breaking the chain, and applied relaxation that can help reducing stress and anxiety and help increase endurance.

Cognition refers to everything that is related to the intellect and knowledge, which implies conscious thoughts, images, and ideas that pass through the mind and interpretations of situations. The basis of cognitive therapy is that thoughts influence how one acts and how one feels, and that by identifying thought patterns that result in anxious feeling and changing them, one can feel better. A method for doing this is scheme-focused work, in which the patient tries to identify their thought patterns, investigate how they were formed and how they affect their feelings and behaviours. Other methods are Socratic questioning where the therapist helps the patient explore their thoughts and its influence on their behaviour and moods, and behavioural experiments in which the patient is putting their thoughts to the test by writing down what they think will happen in a situation and then evaluate what actually happened when faced with the situation (1177.se, 2012a).

MINDFULNESS

The information in the following section about mindfulness is retrieved from 1177, Vårdguiden (2012b). According to 1177.se (2012b), mindfulness is about continuously being in the present, i.e., living in greater awareness of oneself and what is in existence in this very moment. Often, people are not completely aware of the present since thoughts are hijacking the attention, bringing them away from the present to the past or the future and making them caught in planning for the future, worries or daydreams. However, one cannot change the past, the future is unknown, and thoughts of judgement and comparison creates discontent and anxiety.

Thoughts can hinder one from being in the present, but they are impossible to stop. The only thing one can do is to observe them while they pass through. Furthermore, the brain has a hard time distinguishing between thoughts and reality which means that thinking thoughts that makes one anxious or stressed makes the body react in the same way as if these thoughts were real. By acknowledging the thoughts as being nothing more than thoughts and not facts, it is easier to gain a distance to them, giving thoughts of judgement and negativity room to exist without being controlled by them.

Emotions and one's inability to deal with them can cause problems. Some act out their emotions and others try to suppress them, but by just accepting the emotion and exploring it, they can be easier to deal with. However, it can be hard to just observe an emotion. In order to do that, one can try to focus on something else, for example one's breathing before starting to explore the emotion.

By noticing one's emotions and one's reactions to them, it is possible to identify one's reaction pattern. Becoming aware of one's reactions and accepting them without judgement makes it possible to change the patterns. Observing one's experiences also helps one to be in the present and accept one's emotions. In addition, not escaping or avoiding emo-

tions makes it possible to deal with a situation in a different way.

One can increase the ability of being consciously present by meditation and practicing while for example eating, cooking or taking walks, by doing one thing at a time, focusing on what one is doing and experiencing. By doing these exercises one can increase the ability to observe what is there in the moment, without judgement.

Being consciously present and aware reduce stress. Thus, mindfulness is sometimes used in healthcare to increase the ability to deal with stress, pain and psychological issues. It is easy to be carried away in the middle of an emotional or stressful situation. Therefore one can use these guidelines for handling the situation:

1. ***Stop*** - Concentrate on your breathing. By doing this it is easier to gain a distance to your thoughts and emotions.
2. ***Observe*** - Try to get an idea on your thoughts, emotions, body and what is going on.
3. ***Accept*** - Try to accept the situation the way it is.
4. ***Respond*** - By giving yourself some space and a more objective perspective of the situation you might be able to break your old behavioural habits.
5. ***Let go*** - You have done your best in the situation, even though it did not work out as planned. Let go of it and do not thresh or repine, instead be open to the next moment (1177.se, 2012b).

ACT - ACCEPTANCE AND COMMITMENT THERAPY

According to psychologytoday.com (2011), ACT stands for acceptance and commitment therapy and is a mindfulness-based form of psychotherapy aiming to help one accepting difficulties in life without resorting to avoidant coping strategies. ACT is furthermore a comprehensive distancing method, which implies reworking the verbal connections to thoughts and feelings. ACT can help people suffering from depression, anxiety and other psychological disorders. The method focuses on three main areas: "Accept your reactions and be present, Choose a valued direction, and Take action" (psychologytoday.com, 2011).

The acceptance stage is about accepting reality as it is and working with what one has. Obsessing, worrying and thinking about the same thing over and over again can keep one stuck, but by accepting that there are situations that one cannot control, one's personality traits and one's emotions, it can be easier to move forward. Some strategies for working with acceptance are:

1. *"Letting feelings or thoughts happen without the impulse to act on them*
2. *Observe your weaknesses but take note of your strengths*
3. *Give yourself permission to not be good at everything*
4. *Acknowledge the difficulty in your life without escaping from it or avoiding it*
5. *Realise that you can be in control of how you react, think and feel" (psychologytoday.com, 2011)"*

Cognitive defusion is another aspect of ACT which implies seeing feelings for what they really are, i.e. *"passing sensations or irrational things we tell ourselves"* (psychologytoday.com, 2011), instead of what we think they are, i.e. actual truths or facts, or that the feeling never will end. Diffusion is not about avoiding the experience, but only making it more manageable. Some strategies for working with diffusion are:

1. *"Observe what you are feeling. What are the physical sensations?*
2. *Notice the way you are talking to yourself as these feelings are experienced*
3. *What interpretations are you making about your experience? Are they based in reality?*
4. *Grab onto the strands of your negative self-talk and counter them with realistic ones*
5. *Now re-evaluate your experience with your newfound outlook" (psychologytoday.com, 2011)*

7.2 EXISTING HELP FROM THE SURVEY AND THE INTERVIEWS:

COPING STRATEGIES AND LONG-TERM WORK

The respondents of the survey and interviewees also mentioned their experiences from dealing with panic attacks, many mentioned techniques in dealing with a panic attack as it happens and also long-term methods for dealing with the core issues of panic attacks.

STRATEGIES FOR DEALING WITH AN ON-GOING PANIC ATTACK

Many of the respondents stated that they try to control their breathing in order to deal with the panic attack; they try to breath slower, or use breathing techniques such as breathing in a square. Breathing in a square is an anchoring technique where the person focuses on a rectangle shaped object, such as the frame of a window and follows the form with their breathing so that they breathe in on the horizontal lines and breathe out on the vertical ones. Other common strategies are escaping from the situation, using distractions such as listening to music, accepting what is happening and not fight the feeling, and making contact with a friend. Also, two persons responded that they resort to destructive behaviour by throwing up when having a panic attack.

The strategies found in the interviews were similar. Many tries to control their breathing, but some stated that this could be hard since the situation is so stressful that it is hard to do anything about the bodily reactions. As in the survey, some interviewees talked about distractions such as listening to music or reading during an attack to make it go away or subside. Furthermore, two persons talked about having a destructive behaviour including throwing up as a means of taking back the control over their body, and one of them also cut her wrists for the same reason.

LONG-TERM ACTIONS FOR DEALING WITH PANIC ATTACKS

A lot of people are seeing a psychologist or are reading self-help books to help them deal with their issue, and CBT seems to be the most common treatment. Many of the respondents are, in addition, using a prescription drug, either as the only treatment, or in combination with therapy. However, there is also a group of people who feel let down by the healthcare system that has failed to help them either by not having the right competence or by not acknowledging the issue. Furthermore, trying to change the way they think about themselves, eating healthy and exercising as well as stabilising their lives through planning and structure are common strategies. Some people are also trying to challenge themselves by facing situations that they find hard or that trigger panic attacks. There is also a group of people who avoid situations that might trigger panic attacks.

Again, the interviews produced a similar result with people using prescriptions drugs and therapy. However, in the interviews scepticism towards the medicine emerged. Many people do not feel that the drugs are helping them with their panic attacks, but rather just lower their general anxiety level. Furthermore, many have tried different therapy methods without being liberated from their panic attacks. One person stood out in mentioning that she had been helped with her anxiety by ACT and that when a panic attack was coming, she just lets it pass through her. She did not try to fight it or resist it, but let it pass through her.

7.3 REFLECTIONS

There are a lot of treatments in existence, but apparently there is still something missing as people are still suffering from panic attacks. In addition, what implications does the existing treatments have for a future product?

WHY ARE PEOPLE STILL SUFFERING FROM PANIC ATTACKS?

As described, there are a lot of treatment methods for panic attacks but apparently they are not enough. There can be many explanations for this, of which one is that people do not get adequate help from the healthcare system. They are being left without proper care, and some do not feel that their problem is taken seriously. Others feel that the treatment methods do not suit their needs. For example, CBT can be perceived as very demanding since it is all about the person challenging themselves to do things that they feel uncomfortable with. This can be very hard if one's self-esteem has hit rock bottom and one is afraid of embarrassing oneself in front of others if a panic attack was to occur. Mindfulness can also be challenging in a panic situation since it demands a lot of attention and focus from the person, which can be very hard if one is in a full panic mode. Furthermore, it might feel irrelevant and meaningless to think about meditation and mindfulness in a situation full of stress, panic and severe anxiety. ACT can also be demanding of a person since it requires one to fully accept oneself, as one is, flaws and all. Though this seems as a very good strategy in a long-term perspective, it can probably be hard for a person that stands knee deep in shame and self-contempt to embrace. Nevertheless, some people have gotten a lot of help from these tools, and so they are absolutely not irrelevant. However, it seems as there is a need for something else to help people struggling with panic attacks, and for whom these tools are not enough or not right.

PRODUCTIFICATION

The therapy methods used for treating panic attacks all have their strengths and weaknesses and are more or less suitable for different persons. A common characteristic for the therapy methods is that they can be hard to apply and adapt to as a user. Thus, a product helping the user apply the therapy method can be a good idea.

As mindfulness works with refocusing, we saw potential for a product using that strategy in breaking the internal focus, but we had to learn more, so we turned to experts on the area of panic attacks.

8. AN EXPERT'S VIEW ON PANIC ATTACKS

The following section includes information from interviews with experts on the subject of panic attacks. There area of expertise differ in order to give a wide view of the issue and include:

Expert 1: behaviourist at ÅSS
Expert 2: psychotherapist and physiotherapist
Expert 3: psychologist
Expert 4: psychiatrist

Most of the experts have an association with CBT, but none of them solely practice CBT. Their specific thoughts on therapy are presented below. The text in square brackets is where we have interpreted what the expert meant if it was unclear or where information was implied. In addition to the experts interviewed for the project, information from a radio programme by psychiatrist Åsa Nilsonne is included. Finally, the opinions and information by the experts are put into the perspective of the implications it has for this project.

8.1 EXPERT 1 - BEHAVIOURIST AT ÅSS

Expert 1 is a behaviourist and CBT therapist (step 1) that works at Svenska Ångestsyndromsällskapet or in short ÅSS, which in English means the Swedish Anxiety Disorder Society (angest.se, 2016). She works with counselling individuals and groups as well as counselling via ÅSS helpline. In addition, she works with informing the public about anxiety issues.

As for all people working at ÅSS, expert 1 has experience of anxiety-related disorders and therefore has a view of the problem, both as a helping hand to those in need, and as a sufferer herself. We came in contact with expert 1 when finding out about ÅSS and their work for people suffering from panic attacks. Expert 1 proved to be a person full of insights, due to her broad experience of panic attacks and panic disorder, and she became an important source of information and reflections.

WHY PANIC ATTACKS OCCUR

Expert 1 stated that some say that panic attacks are ultimately about a fear of dying even if the person is not aware of that being the root issue, and she stated that if one digs deeper into the fears of a person it can end up in a fear of dying. When faced with the results from our study, i.e., that a fear of dying is not as common as one might think, she said that it can be a result of us not having interviewed people with clear-cut panic disorder but also individuals with other disorders [such as agoraphobia, social phobia and PTSD], and thus we reveal other root causes.

PANIC ATTACK AND THE PANIC DISORDER SPECTRA

According to expert 1, there is a lot of variation in how panic attacks and panic disorder affect a person. For some, the panic obstructs everything and they become unable to do just about anything [constricting their entire lives],

while others have more specific problem areas [e.g. social situations or going by public transport]. Furthermore, she said that some of the persons with panic attacks and panic disorder are very good at articulating their symptoms and triggers, while others are completely unaware of what is going on.

PANIC DISORDER AND OTHER ANXIETY-RELATED DISORDERS

Expert 1 stated that it is common that persons suffering from panic disorder also have other anxiety-related conditions such as social phobia, depression and generalized anxiety disorder. Having multiple conditions can, according to expert 1, be a consequence of having panic disorder that has not been treated and that has evolved into other disorders. She also said that many people with panic disorder develop health anxiety [hypochondria], and misinterpret the panic attack as a heart attack and seeks emergency care.

GENDER AND ANXIETY

At ÅSS, the majority of the members are female. However, expert 1 said that many men participate in the activities at ÅSS. She also said that she has read that women and men communicate about anxiety in different ways, but that she has not experienced such a difference in her work at ÅSS.

THE PUBLIC'S VIEW ON ANXIETY

Expert 1 stipulated that it can be hard for the healthcare system and people around a person with anxiety to detect that they are suffering from anxiety or panic disorders. Many people think that a person with anxiety acts in a certain way, but often, the problems are not visible. This can, according to expert 1, be an issue when a person is trying to seek help for their problem since the doctor can dismiss a patient for acting too "normal".

THE EFFECTS OF ANXIETY

In her work at ÅSS, expert 1 meets a lot of people with severe issues. Some even tell her that their problems are so disabling that they are considering suicide. Others are having trouble taking care of their household and paying their bills.

HOW TO DEAL WITH PANIC ATTACKS

Expert 1 stated that knowledge and information about what is happening in the body during an attack and why the attacks occur are key factors in beating panic attacks. She said that one has to get to know one's own body, recognizing what one's triggers are and when one has to pull the breaks. She also stressed that it is important to *accept* the fact that one might be a person more prone to anxiety, find a balance in one's life and figure out what is most important in one's life. Expert 1 mentioned that exercise can be of good help in order to calm down. In a panic attack, the person often starts to hyperventilate, which in turn leads to other symptoms. Yoga is therefore a good exercise method since this helps the person focus on the breathing, learning their body, breathing and winding down. Furthermore, expert 1 mentioned that mindfulness is a good way of calming down, since shifting focus from oneself, e.g. a fast beating heart, to something outside of the body, can calm one down.

Moreover, expert 1 stated that it is important to lower one's demands on oneself, and said that it is easy to compare oneself to others and get dragged into the stream of demands and expectations. One might think that others never have to fight to stay on top of things and that they are perfect, as opposed to oneself. Instead, expert 1 meant that it is important to be proud of oneself and treat oneself with something nice after one has accomplished something that one thinks is hard.

THE IMPORTANCE OF BEING SAFE AND SECURE

Expert 1 stressed the importance of finding safety and security within oneself, and not just relying on having people around to give one a sense of security. She said that winding down can help one feel more safe and secure, and that a key factor in being safe and secure is to

let go of the control instead of seeking more control. According to expert 1, being truly safe and secure means letting go of control. She said that when faced with an anxiety-triggering situation, one can try to identify what makes one scared and insecure, and then find a way to relate to it instead of trying to control it and let go of the control. After all, it is impossible to know what will happen as it is impossible to predict the future and that one has to learn to live with the uncertainties of life. Furthermore, as opposed to having catastrophic thoughts regarding the future, she recommends doing breathing exercises, and visualising what might happen in a positive way. She also said that is it good to reflect upon one's thoughts and de-dramatize the anxiety and try to question the catastrophic thoughts.

SAFETY BEHAVIOURS

As long as the product that is to be developed does not encourage a person to avoid things, expert 1 did not think that creating a safety behaviour is a major issue. She said that it is difficult to distinguish whether a behaviour is a safety behaviour or normal for a person and that almost anything can be a safety behaviour. For example, many people are helped by carrying an anxiolytic pill in their purse, which can be seen as a safety behaviour according to the CBT perspective, but according to expert 1, it is helpful as it encourages the person to take action instead of being avoidant. Expert 1 concluded that it is important to be aware of and work against safety behaviours, but that she did not necessarily agree with an approach that is too strict. As long as something is done that helps the person, it can be seen as a success.

8.2 EXPERT 2 - PSYCHOTHERAPIST AND PHYSIOTHERAPIST

Expert 2 is a psychotherapist as well as a physiotherapist, working in Gothenburg. Her speciality is cognitive behaviour therapy and she works with psychological evaluations as well as treatment. We came in contact with expert 2 via expert 1, referring her to us due to her skill and knowledge in the area of panic attacks and panic disorder.

WHY WE HAVE PANIC ATTACKS

Expert 2 explained an evolutionary background to the development of panic attacks in humans by saying that the intelligence of the human species is a gift but also a curse. Without our intelligence we would not have been able to invent and use tools, develop languages or build the pyramids. However the downside of our intelligence is our tendency to worry about things.

Expert 2 emphasised that a panic attack is a normal bodily reaction and that this perspective is important in order to treat one's panic attacks. According to expert 2, a panic attack can start with worries and anxiety that in turn affects the breathing. The person starts to hyperventilate and as a reaction to this, the person gets dizzy and can experience tingling sensations in the body. The person can also feel like they are being trapped in a bubble, not able to communicate with the outside world. Expert 2 stated that in order to break this vicious cycle, the person must refocus and stop thinking about what makes them anxious. Moreover, expert 2 stated that panic attacks often occur due to an elevation of the base-tension in the body from stress. As we by nature are reactive prey animals, stress enhances our reactiveness, making panic a natural reaction to a high level of stress and bodily tension. The problem is that many people do not understand why they get panic attacks, to them they occur out of the blue and they might, consciously or unconsciously, try to explain them with being in a certain situation or environment and thus condition the panic reaction to the location. The conditioning of fear is often bodily, meaning that the body itself learns that a situation, for example going on the tram, is dangerous and the body starts to panic. To avoid panic attacks from occurring many people then avoid the situation they perceive as dangerous and the fear

is never dealt with, but is maintained. Since the autonomic nervous system is not affected by intellectual reasoning, these bodily reactions cannot be removed by thinking. Instead, expert 2 suggested that patients should practice on experiencing the symptoms that scare them in a calm environment and teach the body that the symptoms are not dangerous. Furthermore, she suggested that the patients should challenge themselves step by step and do what they feel is dangerous and stay even though panic is starting to hit. Also, the patient should not try to do things that make the situation less scary, as for example sitting close to the door at the cinema, since this is a safety behaviour that also maintains the fear. In conclusion, people having panic attacks usually overestimate the perceived threat but underestimate their capacity to solve it, giving in to a life filled with limitations.

Due to a lack of knowledge of the cause of their panic attacks, many people think *"it must be something wrong with me"* rather than dealing with the root cause and decreasing the general stress level. Furthermore, the thought of panic attacks being something weird and abnormal can be a bigger problem than the panic attack itself since this makes the person feel like there is something seriously wrong with them. By identifying themselves with the panic attacks and that there is something wrong with them; they can get stuck in this identity. Thus, expert 2 mentioned that it is very important to normalise the concept of panic attacks rather than to consider it as a disease. According to expert 2, it is impossible to go through life without concerns, anxiety and fear. Furthermore, she stated that life is filled with more unpleasant feelings that joyous ones and that one has to normalise the fact that a good life is not synonymous with a life free of unpleasantness.

KEEPING AN EYE ON THE THREAT

According to expert 2, many of the things we do, we do to avoid discomfort, like eating to avoid getting hungry. Panic attacks are very uncomfortable and therefore we try our very best to avoid them, by for example avoiding going by tram or stop going to the movies. However, this behaviour keeps our attention on the threat and makes us even more afraid of the panic attacks themselves and the situations that we think induce them. Thus, the fear becomes sustained rather than eliminated. People suffering from panic attacks have a hard time distinguishing real threats and alarms from imaginary ones, which can result in many situations being fearful. Many people then try to increase their control over a situation when they feel unsafe or insecure and anxious, making them caught in a spiral of feeling unsafe and insecure, becoming anxious, and painstakingly trying to control a situation to avoid the insecurity. However, as previously stated, controlling a situation by for example avoiding it, only makes one focus more on the threat which sustains the fear. Expert 2 instead suggested that persons suffering from panic attacks should let the body react to the panic and accept the reaction and then try to turn their focus on something else.

When asked on her thoughts of product solutions focusing on measuring the symptom that the individual fears in order to prove to them that the fear is unnecessary, e.g. measuring the heart rate to show that the person is not risking a heart attack or being able to prove to the person that they are not on the verge of peeing their pants, expert 2 meant that it is counterproductive to their panic as it makes the person focus on the perceived threat.

THE ROLE OF EMOTIONS

Expert 2 stated that our emotions have nothing to do with logical thinking and that the panic reaction in the body during a panic attack shuts down the intellect. However, many of us try to handle our emotions and anxiety with an intellectual approach. Instead, expert 2 suggested that one should focus on how to affect the thoughts rather than how we can affect our emotions. The emotions are uncontrollable, we cannot choose what we feel, but

we can work with the thoughts and interpretations of the emotions.

Expert 2 also stressed that it is important to accept the emotion as it is. By fleeing from an emotion, the emotion and the fear are sustained. The same is true for panic attacks; the panic attack "must happen" and if one tries to hold it back, it only gets worse. Instead, while accepting what is happening in the body, the person should try to refocus from the perceived threat from within, e.g. a pounding heart or a feeling of going crazy, and change their behaviour by opening their eyes to the outside world. The product that is developed in this project could, according to expert 2, be a helping hand in the process of turning the focus from the body and thoughts to what is happening outside of the body.

SAFETY BEHAVIOURS

All of us have safety behaviours and fool ourselves, when we for example say to ourselves that we did not really want the job that we applied for to avoid getting hurt. If the safety behaviour does not cause us problems, it is OK to keep it, but if the safety behaviour is keeping us trapped in anxiety and fear we need to get rid of it. It is important to make sure that a future product does not become a safety behaviour. This can, according to expert 2, be done by giving the person time and space to accept and normalise the reaction before trying to remove or alleviate the symptoms and refocus the attention.

HOW TO TREAT PANIC ATTACKS ACCORDING TO EXPERT 2

According to expert 2, panic attacks should be handled by accepting the emotions and symptoms and then refocusing the attention, as well as working with challenging oneself to expose oneself to situations that one finds frightening. This can be hard since people often trust their catastrophic thoughts rather than the non-catastrophic experiences they have of a certain situation, but without acting against the thoughts of fear there is no way of re-learning how to interpret the situation. A strategy for accepting the emotions and reactions is, according to expert 2, to have a more scientific approach to them and just acknowledge them rather than assigning value to them. The goal is not to remove the panic reaction but to see it and accept it. Furthermore, expert 2 suggested that a product could be handy for refocusing the attention, working as an assistant for mindfulness.

Expert 2 also works a lot with autogenic training. Which means that one practises on conditioning positive bodily reactions rather than negative. One exercise is about teaching the body to enter a calm state by mimicking the body's natural response to calmness, conditioning among other things *"my right arm is heavy"*, *"my stomach is warm"* and *"my forehead is cold"*. Eventually after practicing it will be enough to think, *"my right arm is heavy"* to get the full calming effect. Another way of re-learning is to expose oneself to the perceived threat and teach one's body that one will not die from the bodily reactions.

Preventing anxious thoughts to develop into panic attacks is also a strategy to treat the issue. Expert 2 stated that it is vital to distinguish problem-solving thoughts from purely anxious thoughts, saying that problem-solving thoughts can be of anxious nature but that thinking about the issue makes one progress in the processes of solving the problem. Anxious thoughts, on the other hand, does not bring one closer to a solution but only leave one feeling bad. Problems of a more practical kind can be solved by thinking about them, whereas emotional problems cannot be solved by thinking about them even though we would like that to be the case. Expert 2's strategy for identifying anxious thoughts is an exercise where one allows oneself to have the thought for two minutes, and if one has not gotten any further on the way of solving the problem or if one does not feel better after thinking about the issue, it is an anxious thought. If the two-minute contemplation session resulted in the conclusion that the thought was purely anxious, one should try to refocus and think about something else. This can be hard to do,

but again, this can be something that a product could assist with.

8.3 EXPERT 3 - PSYCHOLOGIST

Expert 3 is a psychologist and a psychotherapist. He has been a part of starting up a sex and relationship clinic with a CBT focus. Furthermore, he is working as an expert advisor at a crisis organization dealing with accidents and disasters. For example, he was responsible for the work during the catastrophic discotheque fire on Hisingen in Gothenburg, in October of 1998. Expert 3 works with different approaches depending on his patients' needs, thus he works both with cognitive therapy as well as an analytical and dynamic perspective. He stated that he always aims to find the cause of the problem when performing therapy with his patients. We were referred to expert 3 via expert 1 since expert 3 is a highly appreciated lecturer, full of insights, at ÅSS.

THE DOWNSIDE OF CBT

Expert 3 is in general very sceptical towards CBT, stating that there are a lot of monetary and political interests in promoting CBT. According to expert 3, societies with a strong foundation in the natural sciences do not like the idea of a human affecting their own life and health, but instead want them to be affected by the system. Thus, such societies prefer CBT and Pavlov's theories of conditioning rather than psychodynamics. He also stated that these societies assume that if a person is taught a logical way of thinking, they become healthy, and that they see it as a benefit that such therapies enables the doctor to avoid getting emotionally involved. Furthermore, expert 3 said that Socialstyrelsen, the Swedish health authority, has caused trauma patients a lot of harm by only providing them with CBT.

THE INFLUENCE OF BRAIN STRUCTURE

According to expert 3, the amygdala is the alarm centre of the brain, and a structure that can block out the hippocampus. The hippocampus is a structure searching for danger and if there is no danger to be found in the outside world, the brain starts to search for internal dangers. This process is, according to expert 3, a melancholic process that is based on the assumption that *"there is something wrong with me"*. He also said that there are other processes such as paranoia where the threat is located outside of the body, and hypochondria when the threat is bodily reactions.

To divert the attention of the brain, expert 3 said that there has to be an explanatory model on the outside, and when faced with the idea of making a product that helps the person suffering from panic attacks turn the focus of the body to a focus on the outside world, he was very positive. He also stressed that the person needs to have a motivation to get distracted. He mentioned that when working with mountain rescue service, the medics in the slope takes on a child's perspective; diverting the attention of the injured patient from the pain to something else. This is done by making eye contact with the patient, and asking about what happened during the accident, making it clear that this information is important to the medics and thus giving the patient an incentive to remember. However, expert 3 stressed that this manoeuvre must be done with a lot of emotional investment by the medic, *"if you just use a method, there is no relationship with the patient, and the patient does not feel connected"*. Expert 3 furthered that memories are effective ways of blocking out pain since activation of the memory shuts down the pain centre and that patients feel 50% less by doing so. Thus, by communicating with the left hemisphere of the brain and the memory centre, one can block out pain.

HOW TO END PANIC ATTACKS ACCORDING TO EXPERT 3

Expert 3 advises his patients to create a playlist with songs to which they have pleasant memories. This should, according to expert 3, distract the amygdala through the memory activation and create a positive effect in

the right hemisphere. Furthermore, expert 3 stressed that it can be hard for persons that are exhausted to process new music, or new things in general. Thus, old music or other familiar things such as a hot cup of tea can be therapeutic. Also, thinking about overall good things causes good reactions according to expert 3, and he stated that if a product against panic attacks is to be made, he thought that it should divert the attention of the person from the panic to something good. To do this, he believed that the product must be personalised to suit the individual, reminding them about pleasant memories or things that they like.

Expert 3 also explained the difference between how to treat patients with panic disorder with a trauma-based approach versus a cognitive and behavioural approach. With a trauma approach, expert 3 stated that the focus is on finding the trauma that has triggered the fight or flight reaction, i.e. finding the cause of the panic attack. He also stated that people suffering from psychological disorders do not have a cognitive language, [but rather experience panic as a feeling that just takes over]. To treat such a person, the psychotherapist has to explain the cause and effect relations and help the patient to build a language and recognize their [triggers and emotions]. On the other hand, CBT is about desensitizing the patient, making them used to, [and in the end comfortable with], situations that [feel stressful or frightening and the feelings and experiences they get during a panic attack]. However, expert 3 was critical to the "quick fix" style of CBT and said that he ends up with the patients that have not been helped by the CBT treatment. Expert 3 is also very critical towards the ten visits policy applied to patients with [psychiatric non-acute conditions] in the Swedish healthcare system and said that visits to hospitals or healthcare centres due to physical conditions do not have this restriction, and [that most people would think it was absurd if there was such a restrictions to visits of this kind].

In a discussion about how to divert the attention of the patient from the anxiety and panic to the outside world with the help of sensory stimuli, expert 3 explained how different senses could help. According to expert 3, affecting the olfactory sense [smell] is very complicated but one of the most powerful ways of triggering memories. For example, patients with posttraumatic stress disorder can get attacks triggered by smells that are associated with a traumatic memory. The sense of [gustation, taste] is also exciting according to expert 3, and he referred to a project in the town of Skövde where people with anxiety were sent ice fishing and barbecuing. The patients did not know that it was a part of the treatment, but the meditative activities combined with the pleasant smells and tastes of the nature and the barbecue, [maybe reminiscing of pleasant childhood memories], lowered the patient's anxiety levels. The visual sense can also be used to divert the attention of people with anxiety according to expert 3, but he stated that one has to exercise the visual sense and practice on actually seeing. He sometimes sends his patients downtown to take a walk and look at the stucco at the top of the buildings. This because expert 3 said that we are not raising our gaze as much as we need to, and that we are not looking at three-dimensional surfaces enough. According to expert 3, we are spending too much time on looking at two-dimensional surfaces, [such as our phones and computers], which bores our brains [giving room for anxious thoughts]. Visual training is also effective for treating PTSD patients according to expert 3, and in this application, eye movement desensitization and reprocessing (EMDR) is used. With EMDR treatment, the patient is helped to process the traumatic memories through moving their eyes in a certain pattern. Furthermore, expert 3 stated that bird gazing is a good activity since this [includes focusing on three dimensional objects far away], and also makes the patient more active, which releases the "feel-good" hormones endomorphine, serotonin and dopamine. Expert 3 stressed that many patients do not know how to refuel their serotonin supply and that they have to be assisted in doing activities that release the good hormones. In addition, expert 3 talks about the hormone oxytocin that

is released by physical contact, stating that it can be hard for people that, for example, are exhausted, to engage in physical contact with others and therefore they suffer from a lack of this hormone. These people can have a desire for displeasure rather than a desire for pleasure, since the feeling of displeasure is in their comfort zone. When expert 3 meets such patients he gives them the advice to go swimming since the flow of water can release oxytocin without making the patient having to interact with another person. He also stated that putting something warm and heavy on the chest can calm patients down and release oxytocin.

A PRODUCT TO HELP PEOPLE WITH PANIC ATTACKS

First of all, if a product is to be made, expert 3 stated that the cell phone might be a bad media to work with [expert 3 first thought that this project was about making an app for a smartphone] since the phone can be associated with anxiety. Persons suffering from emotional exhaustion can even have PTSD triggered by the cell phone.

Expert 3 is positive towards making a product using memory as a strategy for diverting the attention from the panic to something more pleasant. If this is to be done, expert 3 stressed that it is important to make the product custom-made to the individual by programming, or in other ways adapting, the functions according to the specific memories of the patient. Expert 3 said that this can be done by giving sensory input via haptic input, smells, vision, audition or by letting the patient engage in an activity, but the key to success, according to expert 3, is to open the sense that is right for the particular patient. Otherwise the person will not change their state of mind.

Expert 3 also comes back to the influence of music. He has helped a patient suffering from panic attacks occurring while driving in his car by encouraging him to listen to music on the car stereo from a time when he was happy and felt good at the moment the panic started to get to him. According to expert 3, this treatment has had a good effect. He also mentioned putting pressure, heat or vibrations on the chest, and explained that there is a complexity in stimulating the chest area again. On the one hand, the chest is a centre for nerves [which gives it great possibilities for stimuli], but on the other hand, anxiety is centred to the chest, which can make stimuli there uncomfortable or causing anxiety.

Expert 3 thought that we should look deeper into the trauma aspect of panic attacks, since the anxiety always has a root cause, [and try to divert the attention of the patients on the basis of trauma and PTSD].

8.4 EXPERT 4 - PSYCHIATRIST

Expert 4 is a chief physician at the Department of Clinical Neuroscience at the Karolinska Institute in Stockholm, Sweden. We came in contact with expert 4 in the pursuit of a person with more extensive knowledge of the neurological aspects of panic attacks.

Expert 4 stated that panic attacks are a reaction of fear and that the amygdala in this state triggers parts of the autonomous nervous system. A panic reaction also activates the sympathetic nervous system, and he stated that it might be effective to find a way to activate the parasympathetic nervous system instead in order to fight off the panic attacks. Furthermore, expert 4 contradicted expert 3's statement that there is a panic centre in the brain and refers to the processes described previously. Moreover, expert 4 doubted that memories could block out panic in the way expert 3 described it.

Overall, expert 4 was rather hesitant to introducing a product altogether due to the risks of creating a safety behaviour.

8.5 ÅSA NILSONNE

Åsa Nilsonne is a psychiatrist and senior professor of medical psychology at the Karolinska Institute in Stockholm, Sweden (nilsonne.se, 2016). Nilsonne has recorded an episode

of the Swedish radio programme, *Sommar & Vinter i P1* in 2008 where she talks about her life and professional discoveries (Nilsonne, 2008).

In the programme, Nilsonne (2008) stated that anxiety, panic and worry are the most common issues that a psychiatrist meets. According to her, a strength of the human brain is the ability to imagine things that have not yet happened but that there is a downside to this ability, which is that the brain cannot differentiate between what has really happened and what one thinks will happen. For the brain, thinking about a future bad outcome triggers the same emotions as if the bad outcome really has happened. Furthermore, the brain focuses a lot on the future and how to deal with possible future outcomes. In this people can have two different attitudes: one can either be hopeful and think that one will be able to manage what will happen in the future or one can have a hopeless attitude and think that one cannot influence the future. According to Nilsonne, when a person loses hope, suicide is not far away as an option. At this point, intensive treatment is needed to make the person regain hope.

Nilsonne also mentioned that one has to learn where to focus one's attention and to practice steering one's attention. A depressive person focuses their attention on what is in accordance with their "dark" view of the world (Nilsonne, 2008).

8.6 REFLECTIONS

The experts offer different views on the issue of panic attacks as well as different thoughts on the solution. Expert 1, behaviourist at ÅSS, has a human focus from her own experiences of anxiety and from meeting people suffering from panic attacks and other anxiety disorders at ÅSS whereas expert 2, psychotherapist and physiotherapist, expert 3, psychologist, and expert 4, psychiatrist, have a more academic approach in treating their patients. They might encounter people suffering from panic attacks in different ways as one can imagine it being a higher threshold to go to a therapist compared to calling the helpline of an organisation such as ÅSS.

Expert 4 (psychiatrist) contradicts expert 3's statements (psychologist) about focusing on different centres in the brain to refocus from panic attacks as, according to expert 4, the brain is too complicated to make that in a simple way.

TIMELINE OF THINKING

Expert 3, psychologist, also suggested using memories to refocus, which is an interesting distraction but it is problematic and risky as memories are focused in the mind and an excessive internal focus is associated with anxiety and panic attacks. The difference between the internal focus of anxiety and of memories is that anxiety is focused to the future, whereas memories are from the past. Focusing on the past is associated with depressive thoughts and anxious thoughts are associated with the experience of a hopeless or difficult future over which the person has a difficulty to influence. Nilsonne mentioned that the brain cannot differentiate between an imagined bad future outcome and things that have really happened; so thinking nervously about the future gives rise to nervous feelings in the present. This gives an interesting timeline perspective where it is clear that the only time that really exists emotionally is the present. It might be risky to create a thinking tool against panic attacks as it uses the same method, thinking, to get out of the anxiety as what has gotten the person into it. Expert 2 mentioned that one cannot rationalise emotions

by thinking, the only thing one can change by thinking are the thoughts. Viewing a future solution on a timeline, it is preferable to neither focus it in the past nor future, but to use the present as a way of breaking the thought patterns the person can get stuck in, similar to the idea of mindfulness.

SAFETY BEHAVIOURS

Concerning safety behaviours, both expert 2, physiotherapist and psychotherapist, and expert 4, psychiatrist, focus on the risk of a product becoming a safety behaviour, but expert 2 mentioned that there is no clear-cut line on what is a safety behaviour and what a normal behaviour. Expert 1, behaviourist at ÅSS, further said that creating something that can help someone, even if it functions as a safety behaviour, might be better for some individuals that are very crippled by their panic and anxieties. A life with safety behaviours can be better than having no life.

PRODUCTIFICATION

Expert 2 stressed the importance of normalising one's panic reactions in order to not develop a fear for the panic and mentioned a two-minute rule for anxious thoughts. It could be very difficult to find the strength to distance oneself from one's panic for two minutes without assistance, but the strategies in ACT, mentioned in *Chapter 7: Existing methods for dealing with panic attacks* seem interesting. ACT focuses on finding a way to accept what one cannot change and relate to one's suffering in a different manner. Maybe there is a way of using ACT to relate to one's panic so one can normalise what is happening without being scared?

… But is it enough?

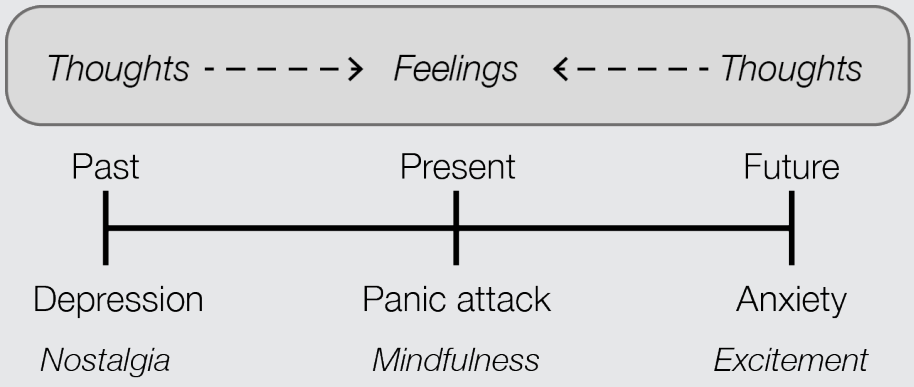


Figure 8.1: Depressive thoughts are oriented in the past and anxious thoughts are future-oriented but give rise to emotions in the present. A positive variant of thinking of the past would be nostalgia and for the future is excitement.

9. SHAME AND VULNERABILITY

Being ashamed of one's panic attacks is a recurring theme in the project and a researcher who has done progress on the subject is Brené Brown. She has done popular TED talks on the subject where she addresses shame and vulnerability. These themes are both informational and inspirational for this project. The following chapters address the themes and insights presented by Brown.

9.1 BRENÉ BROWN

Brené Brown is a sociologist researcher and professor who spent thirteen years studying topics such as vulnerability, courage, worthiness, and shame. Brown has done one of the top five most viewed TED talks in the world, with nearly 25 million views called *The Power of Vulnerability*, during TEDx in Houston 2010. The eye-opening TED talk is relevant to this project as it touches on the subjects of shame, vulnerability and how to live "wholeheartedly" since so many sufferers from panic attacks feel constricted and are ashamed of their condition. Following the success of her 2010 TED talk, Brown did another one called *Listening to Shame* in 2012, in which she dug deeper into her shame research.

Brown mentions in her Vulnerability-TED talk that she started off her research on connection as her experience from being a social worker for 10 years had made her realise that connection is the reason for why we are here, it is what gives purpose and meaning to our lives (Brown, 2010). In her book, *Våga vara operfekt*, with the English title *The gifts of imperfection - let go of who you think you're supposed to be and embrace who you are*, Brown defines connection as:

"The energy that exists between people when they feel seen, heard, and valued; when they can give and receive without judgment; and when they derive sustenance and strength from the relationship."
(Brown, 2015: 43).

Brown states that during her interviews when she asked the interviewees questions on connection, they talked about disconnection. As she asked them about love, they talked about heartbreak, when she asked about belonging they talked about being excluded. This led her into researching shame as, according to Brown, shame is easily understood as the fear of disconnection. This means that if a person is ashamed of an aspect of themselves, it comes down to them being afraid that this is something that makes them not worthy of connection with others (Brown, 2010). There is a difference between shame and guilt where guilt focuses on behaviour, *"I did something bad"*. Shame, on the other hand has a focus on the self, *"I am bad"* and to not be good enough. The difference between shame and guilt is that for guilt one can say, *"I'm sorry, I made a mistake"* whereas shame is *"I'm sorry. I am a mistake"*. According to Brown (2012), shame is highly correlated with addiction, depression, violence, aggression, bullying, suicide and eating disorders, which, interestingly, guilt is inversely correlated to. The difference between shame and guilt is that since guilt is caused by behaviour, it is possible to hold what one has done or failed to do against whom one wants to be and change one's behaviour. Furthermore, Brown states that there are gender differences connected to shame, it feels the same for men and women but the reason for why men and women feel shame are organised by their gender. Brown states:

"Shame, for women, is this web of unobtainable, conflicting, competing expectations about who we're supposed to be. And it's a straightjacket.
For men, shame is not a bunch of competing, conflicting expectations. Shame is one, do not be perceived as what? Weak."
(Brown, 2012, time: 16:10)

Brown furthers her argument by talking about the different norms for men and women. According to research by Mahalik at Boston College, the top answer for what women need to do to conform to female norms for the USA was to be *"nice, thin, modest and use all available resources for appearance"*. Men, on the other hand, were to *"always show emotional control, work is first, pursue status and violence"*. Shame grows from secrecy, silence and judgement and the antidote to shame is empathy according to Brown (2012, time: 18:03).

Empathy fuels connection and it entails feeling *with* another person. In Brown's RSA talk published in 2013, she mentions how to in order to feel empathy for someone one has to connect with something in oneself, making an empathetic response a vulnerable choice. Brown compares empathy and sympathy and states that empathy drives connection and sympathy drives disconnection. An empathetic response is *"me too"* whereas a sympathetic response oftentimes starts with *"at least"*. If a person is struggling and one cannot fix the person's problems, an empathetic response may be *"I don't know what to say, but I am really glad you told me"* whereas a sympathetic response to *"I had miscarriage"* can be *"at least you know you can get pregnant"* (Brown, 2013). Brown mentions four important attributes of empathy from nursing scholar Theresa Wiseman:

- Perspective taking - being able to see the situation from the loved one's eyes.
- Non judgemental - being non judgemental to the person's situation.
- Recognising emotions in others - being in touch with one's own emotions to understand someone else's.
- Communicating the emotions - lastly, one has to be able to communicate the understanding of the emotions.

(Brown, 2013)

As a contrast to the people who live with a lot of shame, Brown found the people who seemed to live what she called *wholeheartedly*, meaning living with a sense of worthiness and with a strong sense of love and belonging. As Brown interviewed these individuals, she saw that the difference between the ones who lived wholeheartedly and those who struggled was that the people who had a strong sense of love and belonging believed they were worthy of love and belonging. This in turn led her into courage and to the original definition being to tell the story of who you are with your whole heart. The people who lived wholeheartedly had the courage to be imperfect.

"They had the compassion to be kind to themselves first and then to others, because, as it turns out, we can't practice compassion with other people if we can't treat ourselves kindly"
(Brown, 2010, time: 8:39)

These people were authentic as they were willing to let go of who they thought they should be in order to be who they were and this was necessary for connection. Further, they believed that what made them beautiful also made them vulnerable. They did not consider vulnerability to be comfortable or excruciating, but necessary.

"They talked about the willingness to say, "I love you" first ... the willingness to do something where there are no guarantees ... the willingness to breathe through waiting for the doctor to call after your mammogram. They're willing to invest in a relationship that may or may not work out. They thought this was fundamental."
(Brown, 2010, time: 9:39)

Vulnerability is the core of fear, shame and our struggle for worthiness, but also where joy, creativity, belonging and love come from.

"To let ourselves be seen, deeply seen, vulnerably seen ... to love with our whole hearts, even though there's no guarantee -- and that's really hard, and I can tell you as a parent, that's excruciatingly difficult -- to practice gratitude and joy in those moments of terror, when we're wondering, 'Can I love you this much? Can I believe in this this passionately? Can I be this fierce about this?' just to be able to stop and, instead of catastrophizing what might happen, to say, 'I'm just so grateful, because to feel this vulnerable means I'm alive.' And the last, which I think is probably the most important, is to believe that we're enough. Because when we work from a place, I believe, that said, 'I'm enough' ... then we stop screaming and start listening, we're kinder and gentler to the people around us, and we're kinder and gentler to ourselves."
(Brown, 2010, time: 19:01)

In conclusion, Brown (2010) states that it is necessary to be vulnerable in order to live wholeheartedly and that it takes courage and compassion to do so, it means being able to live with uncertainty and we have to treat ourselves kindly in order to show compassion to others.

9.2 REFLECTIONS

Brown's research is informative and inspirational for this project as she investigates the subject of shame and many individuals interviewed during the project talked about being ashamed of their panic attacks. Mental health issues in general are something people are ashamed of in the present culture of striving for perfection. In addition, Brown states that there is a gender difference in norms, resulting in gender differences of shame. Men are ashamed of being perceived as weak, which complicates the situation for men who experience mental health problems and panic attacks as they may view this as weakness. For women, on the other hand, the norm is about living up to a large number of standards, and this in turn can be seen in having high demands on oneself which is a contributing factor to getting panic attacks.

PRODUCTIFICATION

Brown's research is inspirational in her discovery of vulnerability being a factor for living wholeheartedly and that empathy drives connection. According to Brown, one has to be compassionate with oneself in order to be compassionate with others. Brown paints a picture of living wholeheartedly that seems to be a dream for many of the individuals from the user study as they talk about being constricted and feeling limited. An interesting aspect would be to use the ideas of Brown and create a product that encourages empathy in order to let the person feel vulnerability and in that way dare to live.

10. THE FACES AND PHASES OF PANIC ATTACKS

To give a more complete image of the persons behind the panic attacks without disclosing any individual participating in this study, five personas were created; they are presented in this chapter. This chapter also summarises the phases of a panic attacks to provide as a conclusion of the previous chapters.

10.1 THE FACES OF PANIC ATTACKS

The personas are called *Losing control Lisa, Exhausted Emilia, Heart attack Henry, Ashamed Ashley* and *Detached Daniela* and they manifest a wide range of problems and background stories. None of the personas are based on one individual alone, but are rather a collection of the stories we have heard. Each persona also has an illustration of how they can feel in the moment of a panic attack. Thus, the illustration does not aim to show what the person looks like during a panic attack but rather how they feel inside. A panic attack is not necessarily visible from the outside, even though there is chaos within.

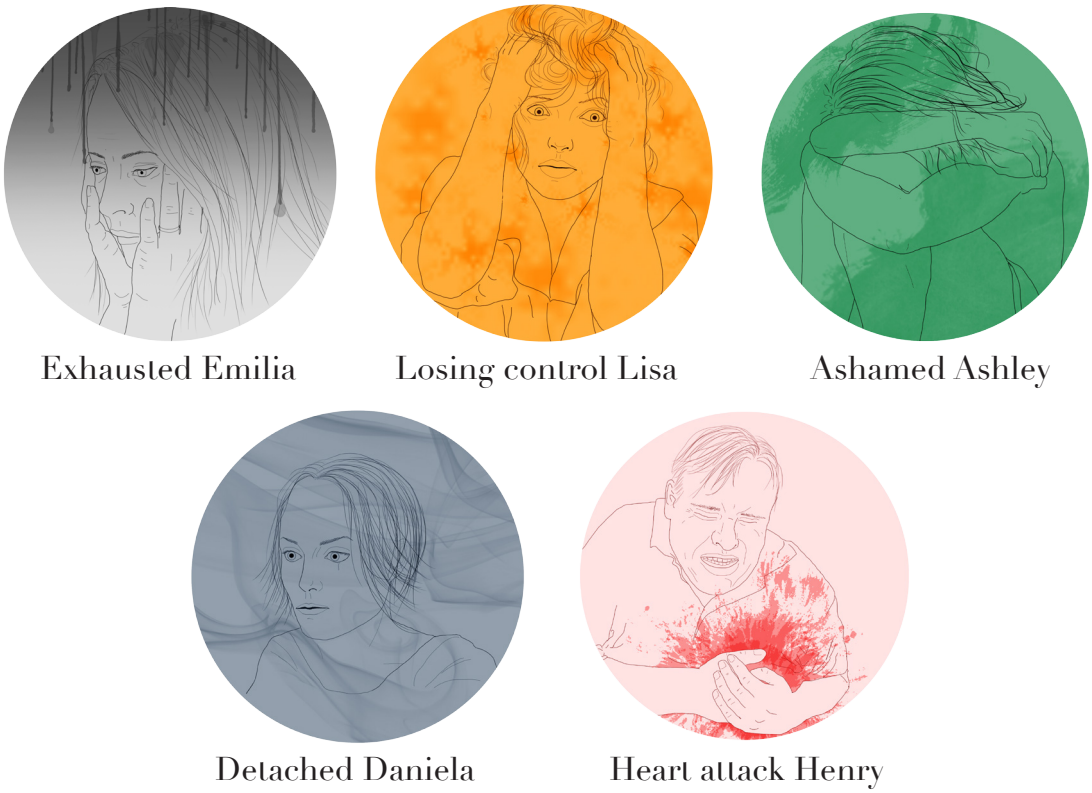


Figure 10.1: The faces of panic attacks including Exhausted Emilia, Losing control Lisa, Ashamed Ashley, Detached Daniela and Heart attack Henry.

ASHAMED ASHLEY

Why can't I just be normal? Everyone else is normal and I am a freak. It's just a matter of time until they'll find out that I am just faking it all the time. If this happens again, I might as well just die.

Ashley is an ambitious young woman, 21 years old. She has always been an overachiever and takes pride in being able to work hard under pressure. Ever since she started at university she has questioned herself and she feels mediocre and inadequate. It has taken a toll on her self-esteem. Ashley constantly fears making a fool of herself and waits for people to find out what a fraud she is as she is not as all as good as everyone thinks.

Ashley was very excited when she got into university two years ago as she had worked really hard for it and thought that she had finally found her place. Moving to a new town and starting university was tougher than she thought and the pressure to live up to the expectations from everyone back home increased. At the same time Ashley started experiencing physical problems. One time when she was on the crowded bus to school, her heart started racing, she got sweaty and instantly and intensely felt that she needed to pee. She felt trapped and got more and more scared that she would pee her pants in front of everyone. She ran out of the bus at the next stop and ran to a restroom, but almost nothing came out. The same thing started happening increasingly often and sometimes she felt like

she was going to throw up, other times pee her pants. One time during a lecture she suddenly felt like she would lose control and pee her pants or throw up and as she was sitting in the middle of the row, she had to force herself to wait and tried to calm herself down until the break when she could run to the bathroom. Ever since she has chosen the last seat in the row and most of the times she does not have to leave the room during lecture. When the feeling is too intense she has left the room but afterwards she worries others will realise what a freak she is that has problems with holding it in.

Ashley started seeing doctors for her symptoms but the tests came back negative; there was nothing wrong with her bladder. She saw several different doctors and they were considering her physical symptoms and she got increasingly desperate to find out what was wrong with her body until finally, a doctor asked her how she was feeling. Ashley burst into tears and explained how stressful everything was and that she was so scared to not be able to live up the expectations everyone had of her. The doctor explained that her needing to pee could have to do with anxiety and that what she was experiencing were panic attacks. It gave her a sense of relief but at the same time she felt increasingly ashamed that there was nothing wrong with her physically but mentally.

Ashley finds it hard going to places with a lot of people and where she would feel caged in and avoids social events with a lot of people. She has convinced herself that it is not important to her to go the cinema, even though she can be surprised by a fierce sting of pain for not being normal and being able to do what normal people do if she thinks about it. She tries to find ways to work around her discomfort by sitting at the last seat in the row at the cinema but she is not comfortable and is constantly keeping an eye on the exit door. She wants to feel calm and secure but instead her body signals panic. Ashley has chosen to live close to the campus so that she can avoid taking the bus to school as she get panic attacks if she is stuck on the bus. It has become increasingly difficult for her to keep her school work up and during particularly bad periods she tries to hide in a hooded sweater or behind her hair, but those days she just feels more watched.

DETACHED DANIELA

It's like I am going fast and everything is going slow. My heart speeds up and I shake but I am not in touch with what goes on around me. I can see people's mouth moving but I can't hear what they are saying or make sense of their words. It's like a dream where I can't trust my sensory impressions.

Daniela has suffered from her panic attacks off and on for 10 years. She is 25 years old and is sick and tired of her panic attacks. She thinks it's difficult to see a pattern for the periods of when the attacks come, but it seems to be worse when she is under stress. The destructive stress is not stress coming from being busy at work, on the contrary, Daniela likes staying busy. The stress that breaks her down is the psychological stress of having many things unknown in the future or a needing to rely on many things to go well in order for something to work. She is worried about her future, as she has had problems getting her adult life started after suffering from mental problems. Daniela was hospitalised for some time in her youth as she had issues with self-destructive behaviour.

During periods when Daniela feels worse, she can wake up and feel that it is a bad day and she knows that a panic attack will come. She tries to distract herself and avoid the attack but eventually it comes. She hates getting panic attacks in public as she feels like she is not in the present; she is there but not there.

Daniela is detached from reality, feel disoriented and it is as if it is all a dream. It

is like she is in a bubble and distanced from everyone else. Her sensory impressions are confused and things do not feel as they should. Daniela hates this feeling, as it is excruciatingly uncomfortable and after an attack, she is worried about how other people perceived her; maybe she looked strange or did something weird.

Daniela used to value symptoms differently as some symptoms are more visible than others. Feeling detached does not show whereas when she is hyperventilating, the people around her can see that she is going through an emotional hell. She used this to prove to people around her that she deserved her place in the hospital in her youth. She dislikes how the panic attack storms in and takes absolute control over her body and the feeling of derealisation and depersonalisation (not being a part of her body) made her use self-destructive methods to regain control of her body. She would cut herself so that the pain would be transferred from an invisible pain on the inside to a palpable pain on her body. This efficiently stopped the panic attack, but she knew that it was not a sustainable solution. During the years of chaos, she would also throw up to stop a panic attack.

"Sometimes I would throw up on purpose or by the sheer amount of anxiety and tension in my body, but I don't anymore."

Afterwards she would be exhausted but the panic went away. Nowadays, Daniela does what she can to not follow the self-destructive impulses during her panic attacks. She wants the panic attacks to stop taking control over her body and even though she avoids being self-destructive, she would want something to help her keep control of her body.

EXHAUSTED EMILIA

Emilia used to do it all. She was busy at work, she was busy with the new house and she was busy with her kids. Sure, she was tired before it happened, but it was just a matter of keeping busy and getting everything done. She did experience some stress, especially balancing her young children with the new responsibilities at work, but not so much that she knew what was about to happen. She has gone over it a million times in her head, did she see the symptoms? Could she have stopped it? She liked being busy, that was who she was. And then one day she had an attack at work. It was not the first time in her life she had experienced anxiety, but it was intense. It was so frightening. Her pulse went wild and she had trouble breathing and she started hyperventilating, she got dizzy, started trembling and sweating and her hands went numb. She tried to hold it together long enough to get home. The next day she could not get out of bed. Not that she did not want to, it was just impossible to physically sit up and get out of bed. And then there were three months when she could not get up. Her husband took care of the children and Emilia did manage to get to the doctor's office in order to get sick leave from work. The doctor said she was exhausted. They used to call it being burned out, but that was an old fashioned word, Emilia would get her energy back, that was a promise from the doctor. Maybe not the same amount of energy, but she would get better. The doctor also explained that the attack Emilia experienced was a panic attack. Emilia recognised the symptoms of the attack from a couple of times when she was younger and under a lot of pressure, but she had never realised that they were panic attacks. During her time recovering, Emilia was truly exhausted and the attacks kept coming. She could have several attacks per day. It was as though her whole system was so exhausted; the smallest amount of effort brought her over the edge and into a panic attack. Some days were like one long panic attack cycling between panic and exhaustion, as soon as her body had a small chance to recover some energy, a new attack started.

At first Emilia had trouble accepting that she was sick, but as she kept resting, she got better. The panic attacks became less frequent, but they did become a part of her life. She had to make a lot of lifestyle changes; she stopped working at the stressful job and started working a job where they know of her condition so she could work as much as her energy permitted. It was a process of getting to know herself.

It's like I've become allergic to stress. If I stress too much and if I don't take care of myself, I get a panic attack. Sometimes it's difficult to know what I should and shouldn't do, one day I need exercise to wind down and relax and the other the exercise is too exhausting and I get a panic attack.

Now it's been ten years since her breakdown and she has worked out a lot of strategies to try to live with her panic attacks, trying her best to not push them away or avoid them. She practices ACT therapy, a way of observing and accepting thoughts and feelings, without being swept away by them.

"Nowadays I try to listen to what people are saying, listen to the outside and not the inside. I am in the present instead of focusing on my thoughts and feelings. I still have the anxiety, but I choose not to focus on it."

She also eats well and exercises. She makes sure to have alone time regularly. When an attack sweeps over her, she does not fight the feeling, she tries to breathe slowly and think that this too shall pass. The last few years she got sick and tired of the silence around problems with mental health and she started being open about her problems and background to people in her surroundings.

"Take me as I am. If the person is bothered with what I talk about, I always think that they are not in touch with their emotions. A lot of people are afraid of it being contagious and they are afraid of their own thoughts. They find it uncomfortable that I have met my demons and they are afraid that if they start talking about it, they will start feeling the same way."

HEART ATTACK HENRY

People are too weak nowadays. They complain and they can't work hard. I have always believed that there are no shortcuts in life, you have to work hard and not give in to laziness.

Henry is a 53-year-old man working as a middle manager at a large company. He has always believed in not being weak, or at least not showing weakness, and working hard. One day, during a meeting, he thought he was having a heart attack. He was just about to present the quarterly report, a presentation he had dreaded as he prefers to not have everyone's eyes on him, when he felt a sharp pain in his chest, his heart started racing, he started trembling and it was almost impossible to take a breath and he got a tingling sensation in his hands.

"My heart was racing and there was this intense pain in my chest. I thought the stress and high cholesterol finally resulted in a heart attack."

Henry made quite a scene in the meeting and was rushed to the hospital in an ambulance. He had to stay there for some time and they took one test after another.

After a while the doctor came to his room and showed him a list of symptoms and asked if he recognised them.

- *Palpitations, pounding heart, or accelerated heart rate.*
- *Sweating.*
- *Trembling or shaking.*
- *Sense of shortness of breath or smothering.*
- *Feeling of choking or difficulties swallowing.*
- *Chest pain or discomfort*
- *Nausea or abdominal distress*
- *Feeling dizzy, unsteady, lightheaded, or faint.*
- *Derealisation or depersonalisation (feeling detached from oneself or one's surroundings).*
- *Fear of losing control or going crazy.*
- *Fear of dying.*
- *Numbness or tingling sensations.*
- *Chills or hot flashes.*

He recognised the first 6 lines, but not the nonsense ones about feeling like he was going crazy. He could agree that this list corresponded to his experience, and the doctor explained that he thought that Henry was in fact experiencing a panic attack. Henry was baffled. Was it not a heart attack? Were they sure? Apparently the tests came back negative for heart attack, and the doctor said that that was a good thing. There was nothing wrong with Henry's heart. Henry went home, a bit confused and a bit embarrassed - what would he say to everyone at work? And the big scene with him grabbing his chest and going away in an ambulance. A heart attack would have been easier to explain. People understand physical problems. The panic attack nonsense is not something Henry can identify with. He stayed home from work the next day, as he was dead tired and had to stomach his experience. His wife Suzy was a lovely, accepting person, but Henry prefers being the strong one and not complaining.

When Henry finally went back to work, he shook off the few questions about his health that he met. Most people knew not to approach him about anything personal, and he managed to avoid questions. Henry was afraid the symptoms would to come back. Sometimes when he went up a flight of stairs, he felt his heart beating faster, and he got scared that a panic attack would come. Sometimes it did. He started avoiding taking the stairs and he preferred to not having to hold the presentation at the next meeting.

"What if someone would see me being weak like that at work, I won't have it."

At home, his wife had been better at talking about emotional things with their children, Henry had always been good at work. He is confident at work and he knows he is an important part of the company. The period before the first panic attack had been more stressful, with the kids leaving home and him and his wife being alone again. Suzy had mentioned that she felt like she did not know him anymore, and when the thought hit him that maybe she hesitated on spending the rest of her life with him, he got worried. He had had some nights where it was difficult to sleep, and of course this coincided with their quarterly meeting with the directing board, but he had experienced worse stress before, so he did not understand why he got a panic attack.

The second panic attack was also a terrifying experience, but this time he managed to have it so that nobody noticed by taking a break and going into the restroom. He kept feeling like his heart would explode and even though he knew that it was not a heart attack the last time, he kept thinking that maybe this one is a real heart attack?

LOSING CONTROL LISA

Lisa is a 27 years old woman whose panic attacks became a serious problem when she was about 15 years old. In retrospect she has realised that she probably experienced anxiety from an early age, which she remembers as stomach vaches when separated from her parents. Being with people she feels safe with is still important for her in order to feel well and to keep her anxieties low. Nowadays, the number of people she feels safe with includes her husband with whom she has been married recently, her family members and a small amount of friends. She calls her husband and her parents for her "safety persons" and she needs to stay in contact with them regularly in order for her anxieties not to take over. She finds it difficult to be alone, but when she is not feeling well, any person does not do. She prefers being by herself if she cannot have one of her safety persons be with her.

Feeling safe and secure influences Lisa's entire life and keeps a tight hold on the choices she makes. Ever since a massive panic attack in the city centre, she has avoided travelling to that city and goes to a town with a smaller amount of stores where she feels as though she can maintain control even though they do not have everything she wants. Lisa usually prepares well before outings in order to feel that she can handle going away; sometimes she can do a test drive with a safety person with her before she drives to the place alone.

When Lisa is having a panic attack she usually calls one of her safety persons and if she gets into contact with the person, the panic attack usually ends quicker. Getting into contact with her safety persons is important to her as it makes her feel like she will be alright. If she does not or, even worse, if the person is not located where she thinks or doing what she expects, the panic escalates as it increases the feeling of being detached from reality. In addition to preparing before she does something she is not comfortable with, Lisa also constantly mentally prepare with escape strategies, so she knows that she can leave whenever she wants to.

As long as the safety person is with me, I know it will be alright.

Lisa's greatest fear and pain concerning her panic attacks is the feeling of losing control and going insane. She is constantly scared of losing control and she tries to stay in control all she can. When she is in control, she feels better but if she feels that her safety behaviours does not work, everything feels worse, as if she has already lost control. Lisa has a hard time trusting herself and that she can handle her panic attacks after experiencing how the panic attacks comes without notice and completely takes over her. A typical panic attack starts with her heart racing and a feeling of suffocation. Sometimes she can distract herself so that the panic attack does not get worse, but if a doubtful thought comes and she thinks that she might not be able to handle it, the panic accelerates into a stage signified by a feeling of not be in contact with reality and like she is losing control, which is the worst.

Lisa has been frightened by the impulsive negative thoughts she has had during bad attacks and she is afraid she might lose control and do something irrevocable. She has a tremendous fear of going crazy, accidentally committing suicide or losing control and hurting someone. Sometimes Lisa is afraid of falling asleep, as she fears that she might kill her husband. One time during a particularly bad panic attack, Lisa wanted to die, just to make the panic attack stop and ever since she is afraid of herself and what she might do if she lost control.

"I've had a hard time to admit some of my more difficult impulsive thoughts about doing something bad, such as on impulse jump in front of a train and kill myself during a panic attack"

Lisa fears going crazy during panic attacks, even though she has read that she will not be schizophrenic or get a psychosis from a panic attack, it still feels like she is losing her mind during an intense panic attack.

Lisa has tried different kinds of therapies throughout the years but has not found a therapy that has really helped. Her doctor has prescribed SSRI medication, which she does not feel, helps so much against the anxiety, but she feels less depressed now that she is on them.

Lisa just wants to feel free from the panic attacks. She wants to be able to travel and do what she wants and not having to work around her panic attacks. Sometimes Lisa can grieve not being able to do things she is not even interested in, she just want to feel free and able to do what she wants. Lisa wants to start a family but does not feel able to take care of children in the state she is in.

10.2 THE PHASES OF PANIC ATTACKS

This chapter summarises the general findings on the phases of a panic attack. In the graph (figure 10.2), a line above the mid-line shows that the person feels good and calm, while a line below the mid-line shows that a person is feeling bad and in panic. Thus, the higher above the mid-line, the better the person feels, and the lower below the mid-line, the more in panic the person feel.

BEFORE

The reasons or triggers for a panic attack are different for different people, but common ones are stress, having high demands on yourself, situations one feels like one cannot control, being trapped or being somewhere you have gotten a panic attack before.

Before an attack, the person can feel normal, or slightly more anxious and the first symptom can come from out of the blue.

At the first, smaller, dip in the graph the first sign of a panic attack starts to appear, it can be physical symptoms such as trouble breathing or heart palpitations, or psychological symptoms such as thoughts that things could go wrong in the situation like:

"what if I get trapped in this bus?"
"what if I do something wrong in this situation, what will people think of me?"
"what if I can't handle the situation?"

DURING

The persons can manage to calm themselves down, but just as they thought they could handle it, the panic can strike with full force.

Some people understand what is about to happen when the first symptoms starts to appear, but many others do not know what is happening until after they have hit rock bottom.

The symptoms can be heart racing, difficulty breathing, numbness in hands and feeling dizzy. These symptoms can shift into feelings of not being in the present, being out of touch with the surroundings and feeling like you're going crazy.

AFTER

Eventually the panic subsides and the person often feels drained of energy, empty and ashamed of having yet another panic attack. Recurring panic attacks can affect the person's entire life and what most people want is to just feel free.

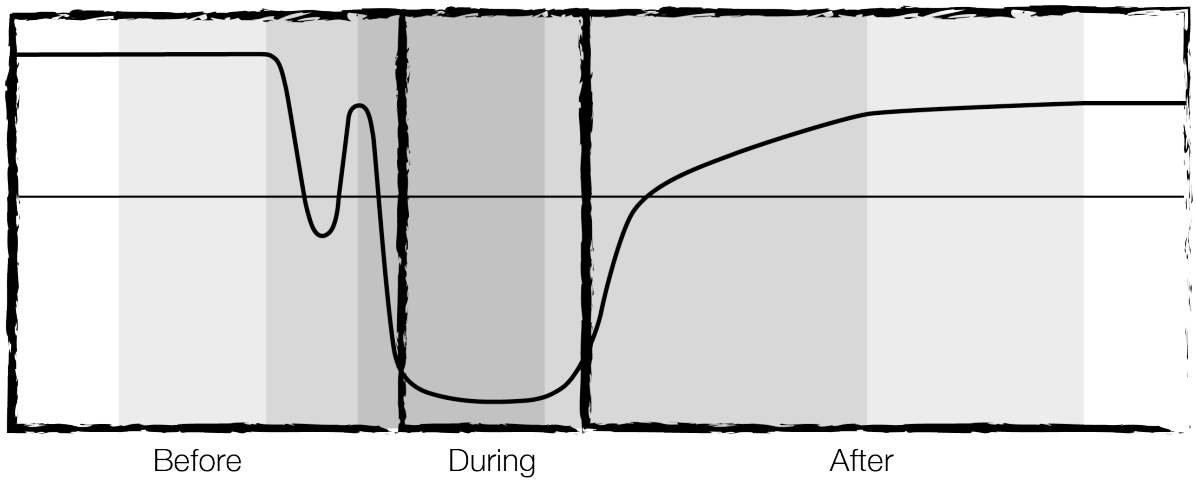


Figure 10.2: The phases of a panic attack.

10.3 CONCLUSION

The personas illustrate that there is a range of persons with different background issues, triggers and experiences of panic attacks. This shows the importance of taking a wide perspective on future product solutions as different individuals with panic attacks have different needs.

Furthermore, a panic attack is experienced very differently depending on which phase you are in. Therefore the needs on a product might vary during the course of a panic attack.

11. EARLY PRODUCT IDEAS

Throughout the project, ideas of products and design approaches were ideated based on discoveries made. This chapter summarises and gives a short evaluation of the ideas.

11.1 APPROACHES

In the process of framing the problem, different approaches were ideated and considered concerning how to design a product against panic attacks. The approaches focus on the attitude the future product can have towards panic attacks and instil in the person using it, such as *Don't panic* or it's *OK to panic* and categorised according to the way they relate to panic attacks, such as refusing panic attacks or accepting them.

The process of ideating the approaches was important as it gave realisations that there are many ways a future product can attack panic attacks. As an understanding of things such as safety behaviours has developed, solutions that refuse panic attacks have been deemed less successful from that perspective.

11.2 EARLY PRODUCT IDEAS

In addition to approaches, several product ideas were ideated during the early phases of the project. Some were discarded as their likelihood of fuelling a safety behaviour were high and others remerged in the concept development phase, but with slightly different focuses.

MEASURE

The basic idea of *measuring* was to provide the person with a measurement of what the person is scared of in order to prove to them that nothing is wrong and this should calm them. For example, a person who is scared of having a heart attack could be calmed if they received

TABLE 11.1: APPROACHES ON DESIGNING AGAINST PANIC ATTACKS

Category	Approach	Solution
Refuse	Don't panic	Prevent/interrupt/stop
Accept	Give in to panic	Guide
Accept	It's OK to panic	
Accept	Don't be ashamed to panic	Help after PA
Accept	Be proud to panic	Loudly announce PA
De-dramatize	It's no disaster to panic	
De-dramatize	It's just panic	
Refuse	There is no inner disaster to panic	
Refuse	There is no outer disaster to panic	

data on their heart rate and could see that it was in fact not a heart attack.

The risk with providing the person with a measurement to calm them is that the means of calming themselves down is in the external world, creating a dependency on an object and a safety behaviour that is not dealing with the core issue of fearing a heart attack, but offer a symptomatic solution that maintain the threat of a heart attack. In addition, being dependent on a measurement raised questions such as what would happen if the heart rate actually was high? Would the person get even more scared? Depending on good measurements is hazardous for if the measurements are bad.

Below are two variants of the *measuring* idea:
- Is there really pee in the bladder?
- Is the heart really beating fast?

WEARABLE

The idea of creating a wearable product lived with us for a while as a positive aspect of wearing the product is especially prominent for the individuals suffering from intense feelings of derealisation and depersonalisation. They reported an inability to remember their medicine and an issue for them could be to remember that a product existed. The downside of wearable products is that the panic attacks can come seemingly from out of the blue and in order to have them during panic attacks, the person would need to wear them all of the time. In addition, wearing a product close on the body is very intimate and might be uncomfortable. We want to provide the user with the power, as many mentioned that they feel out of control, and maybe a product that is on their skin is too intimate?

A few ideas of wearable products:
- Bracelet giving sensory input
- Hiding kimono with the following features:
  - Sound isolation
  - Vibrations
  - Warmth
  - Hugging sensation
- Ring with balls to fiddle with
- Oxytocin stimulating shirt
- Shirt helping one to adapt to appropriate heart rate and breathing pattern
- Glasses augmenting reality - focus on visual input
- Shirt with pressure zones
- Hand held thing attached to a bracelet - accessible at all times

SNAP OUT

To provide a product helping the person to *snap out* from a panic attack, especially from feelings of derealisation and depersonalisation was a favourite that survived and evolved. The early ideas of *snap out* were quite intense and overpowering, including holding something cold or tasting something strong. The *snap out* ideas were tested in development phase, see *Chapter 13: Exploration of the senses*.

Examples on *snap out* ideas:
- Cold thing
- Candy with strong taste
- Nasal spray with smell

JOURNEY

Helping the user go through the panic attack by providing them with something along their journey lived and developed in later concepts. The *journey* approach has variations where the user can be preoccupied by simpler, physical tasks that also represent that the panic will pass. Some have a clear start and finish such as making origami (maybe the user burns the paper afterwards to symbolise that the attack is over?), other products can symbolise the journey and be reused, like a rosary. A product combining sensory inputs and guidance could give a haptic input and then guide the person through the attack by ACT.

A few ideas of the concept:
- Handcrafting
- Painting/drawing
- Origami
  - Fold the paper and then burn it when the attack is over

- Autogenous training while fiddling with thing
  - Massage thing - something happens - mantra
- Rosary representing the process of getting through a panic attack
- Product is telling the user that they have two minutes to think about if there is a solution to a problem and then helps the user to refocus
- Haptic input + voice guiding the user to accept and refocus

ACTIVITY

Similarly to the *journey* ideas were the idea to provide activities that the user can focus on. This idea resurfaces later in the project.

Two ideas on the approach are as follow:
- Pendulum
- Massage blob

APPS

An app could be a good format to provide the user of guidance and information on panic attacks. If information about the user and the user's panic attacks are put into an app, aggregated information of the person's panic attack could provide them with knowledge of themselves as a way of de-dramatizing the panic and getting to know themselves. Apps are accessible and can store data, which is good, but the investigation showed that despite the fact that there are apps on the market, not many persons suffering from panic attacks use them. A technological solution can feel distant and the impact of an app is not big enough. Our gut feeling told us that an app is not enough and that there are other ways of creating a product that can leave a more personal and greater impact.

However, we still had some ideas on products:
- App guiding one + acceptance and information
- App measuring one's panic attacks and show aggregated data so one get to know one's panic

11.3 CONCLUSION

In conclusion, some product ideas died early on as negative aspects of them were realised, mostly concerning creating dependency and safety behaviours. Solutions focusing on symptoms were quickly discarded as they are limited to specific symptoms, and often can create a safety behaviour. Other ideas survived and evolved into concepts throughout the project. These ideas were promising as they offer the possibility to work what we see as the main problem that will be stated in the next chapter.

12. THE DESIRED EFFECT OF A FUTURE PRODUCT

On the basis of the stories told by the ones suffering from panic attacks and the therapists helping them as well as the information featured in literature, the effect of a future product could be determined. This includes identifying the main problem that the product should solve, as well as identifying the target group and determining the needs the product should fulfil. *Chapter 12: The desired effect of a future product* ***can be seen as a conclusion of the previous chapters, providing a stepping stone into the development phase, called*** *Part 2: Concept development* ***in this report.***

12.1 THE MAIN PROBLEM: THE INTERNAL FOCUSING ON THOUGHTS AND BODILY REACTIONS

Making one of the symptoms experienced during a panic attack less painful would probably make the panic attack less uncomfortable and scary. However, the symptoms that are experienced vary a lot from person to person, and a relief from one of the symptoms does not necessarily make the other symptoms easier to manage. Furthermore, a symptomatic treatment would not get to the root of the problem, but only making a panic attack little less uncomfortable.

Instead, a common denominator that is closer to the core issue is internal focus. During a panic attack the person suffering from it becomes self-centred. They over-focus on and over-react to bodily reactions and thoughts, thus making the spiral of anxiety worse. For example, anxiety is elevated and the heart beats faster, so the person focuses on the heart rate and thinks: *"Is something wrong with me? Am I having an panic attack? Or, am I having a heart attack?"* The thoughts elevate the anxiety and the heart beats even faster and the panic attack takes over. This vicious cycle is illustrated in figure 12.1.

The internal focusing does not only contribute to starting a panic attack, but can also maintain an on-going panic attack, making it last longer. If the focus on the bodily reactions and the own thoughts could be turned to a focus on the world outside, the bad spiral might be broken and possibly prevent a panic attack from occurring or help alleviate an on-going panic attack.

Furthermore, when examining the data from the interviews with therapists and persons suffering from panic attacks, as well as the literature, two main strategies for dealing with panic attacks emerged. One strategy had an "*inside out*" approach and involves the sufferer gaining control over the symptoms by breathing in a calm way and reassuring themselves that everything is going to be OK. This strategy also involves tools such as breathing in a square and other breathing techniques designed to help the person focus on their breathing pattern. The other strategy have more of an "*outside in*" approach. By including the world around oneself as described in both mindfulness and ACT, acceptance and commitment therapy, one can refocus from the anxious thoughts and painful symptoms. One of the interviewees stated that biting in lemons and holding ice are used in the emergency care of patients with panic attacks as a tool for breaking the feelings of derealisation and depersonalisation by giving an input from

the world outside of the body, strong enough to make it impossible to ignore.

Put together, the focus on anxious thoughts and symptoms is a core problem, and as of today there are therapy methods focused on attacking it. The character of the problem as well as the therapy method designed to defeat it also shows promise for productification since it is based on putting focus on something in the external world, rather than affecting a person's thoughts.

The main problem is therefore identified as *the internal focusing on thoughts and bodily reactions* which implies that the product should help turn the focus from oneself to the world around them.

12.2 USERS AND CONTEXT

The needs of the users in the target group, in general, and with regards to the context specifically put demands on the effect a future product should achieve.

USERS

As previously stated, many people have experienced a panic attack. However, all those people are not considered to be the target group of a product against panic attacks. Instead, those who experience panic attacks on a regular basis, e.g. those with panic disorder, and those who feel limited in their lives are the ones we have decided to aim the product towards. Thus, the product is not directly aimed at the ones given the diagnosis of panic disorder, but to all persons struggling with recurring panic attacks or attacks similar to panic attacks, independent on what primary diagnosis they may or may not have. These persons have problems that are large enough for them to have the incentive to seek a solution to their problem and that are more likely to be invested in trying something new. Thus, the personas introduced in the previous chapter illustrate the target group for the product.

CONTEXT

The persons responding to the survey as well as the persons participating in the interviews demonstrate a wide range of places where panic attacks can occur. Some people think it is more painful to have a panic attack when they are alone, but others think it is worse having it in public where others can see them. However, the most challenging context from a product development and productification perspective is the public space since this demands the product being discrete and easy to bring with

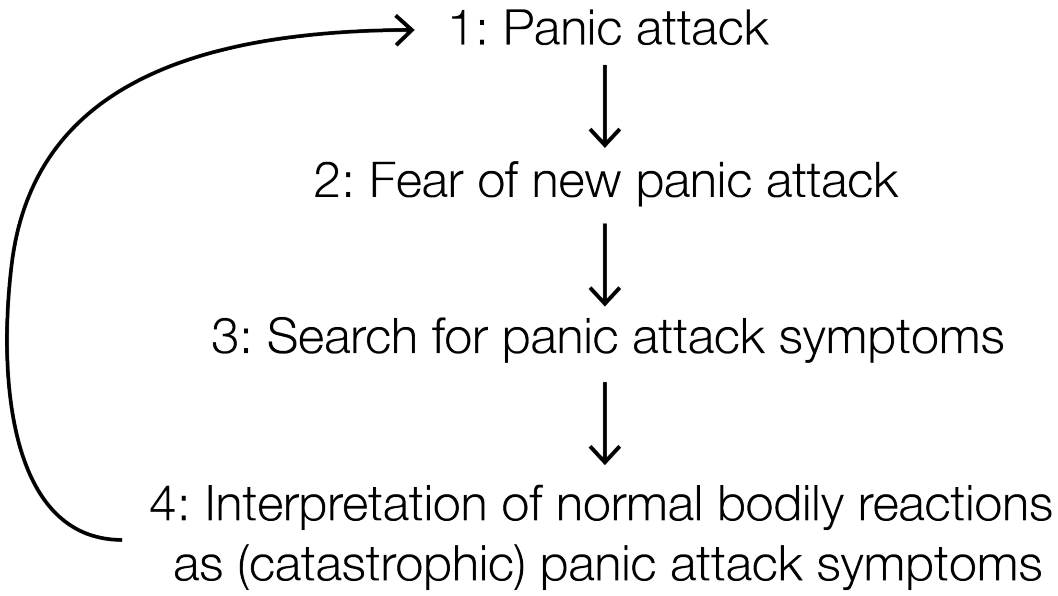


Figure 12.1: The vicious cycle of panic attacks.

oneself. Therefore, the public space is the critical context for this kind of product and thus, a product efficient in the public space is probably also efficient in a private setting.

12.3 VALUES AND ABILITIES

In order for a product to actually help against panic attacks, it has to possess certain values and abilities, which are featured in this chapter.

BEING OF HELP IN A PANIC ATTACK

The product must have the ability to break the internal focus on thoughts and bodily reactions in order for it to address the main problem. Furthermore, we believe that the product should facilitate both a *snap out* effect, and a *calm down* effect in order to help the user in different stages of the panic attack.

AVOIDING SAFETY BEHAVIOURS

Aside from attending to the main problem, the product must also take safety behaviours into account. One of the ways we have dealt with this issue is to make sure that the product does not exchange the panic attack with something else, which would refuse the user the room for reflections. Thus, the product should help the user *include* the world around them in order to break the internal focus, but not *exclude* the panic attack and the reflections on it. If the inner dialogue and the reflections upon what is happening in the panic attack are extinguished by the product, the person does not have a chance to accept and normalise the panic attack. Moreover, a product that just shuts down the panic attack does not help the person take control over the panic attack themselves, but rather encourage the person to fight a war with the panic attacks. This can be compared to it helping them to ride out the wave of the panic in a peaceful way without judgement and fear.

In relation to the therapy methods mindfulness and ACT, one can imagine that a product that amplifies mindfulness could risk becoming a safety behaviour. If a product could help the user focus solely on something else but the panic attack, similar to biting into a lemon that was described previously, the product could become like a magic switch shutting down the panic attack without giving room for reflections and acceptance.

ACT on the other hand is a method working with acceptance. If a product were to be based on the philosophy of ACT, the internal focus could be broken, not by completely taking away the focus on thoughts and bodily reactions, but by reminding the user of the external world, giving the user some relief but maintain the possibility to reflect upon and accept what is going on.

Please see figure 12.2 for an illustration of the difference between a product that can create a safety behaviour and a successful product.

In order to further reduce the risk of becoming a safety behaviour and creating a dependency, the product should become redundant when the user have learned enough from it to be able to manage their panic attacks on their own. This implies that the product should have the value of teaching the user how to manage a panic attack. We think that this temporary and educational view of the product can help the person not attach too much value and power in the product itself in a long term perspective, but rather make them feel that the product is empowering them to become more valuable and powerful. Thus, the idea of the product is that the value will be transferred from the product to the user in a long-term perspective.

A final measure to reduce the risk of creating a safety behaviour is to put the power of the product in the hands of the user. In other words we believe that it is important to let the user be active during the use. However, the state of the user is a complicating factor since some feel very distant from the world around them and some has an impaired ability to hear and see.

USABILITY AND USER EXPERIENCE ASPECTS

A more practical value that is important for the product, is the ability to bring it to a location outside the home in order for the person to have it with them in the situations the they find the most difficult. In addition, it is important that the product is discrete in order for the persons to decide for themselves if they want to show others that they own a product aimed to help against panic attacks.

Lastly, the product should have the ability to influence the user on many levels. Donald Norman (2004) explains emotional design being divided into three categories: visceral (the immediate, universal and biologically attractive or unattractive), behavioural (the subconscious pleasure or displeasure of using a product and the emotions elicited from its physical properties), and reflective (the conscious reflection of meaning, self-image and personal satisfaction in a product). With Norman's theories as an inspiration, we determined three abilities that we believe the product should possess. First of all we want the product to influence the user in an visceral and immediate way, making them refocus. Secondly, we want the user to reflect upon the emotions and feelings they have, and thirdly, we want this reflection to encourage a change in behaviour of the person (note that we here refer to the behaviour of the person in opposite to Norman's behavioural level that refers to the behaviour of the product).

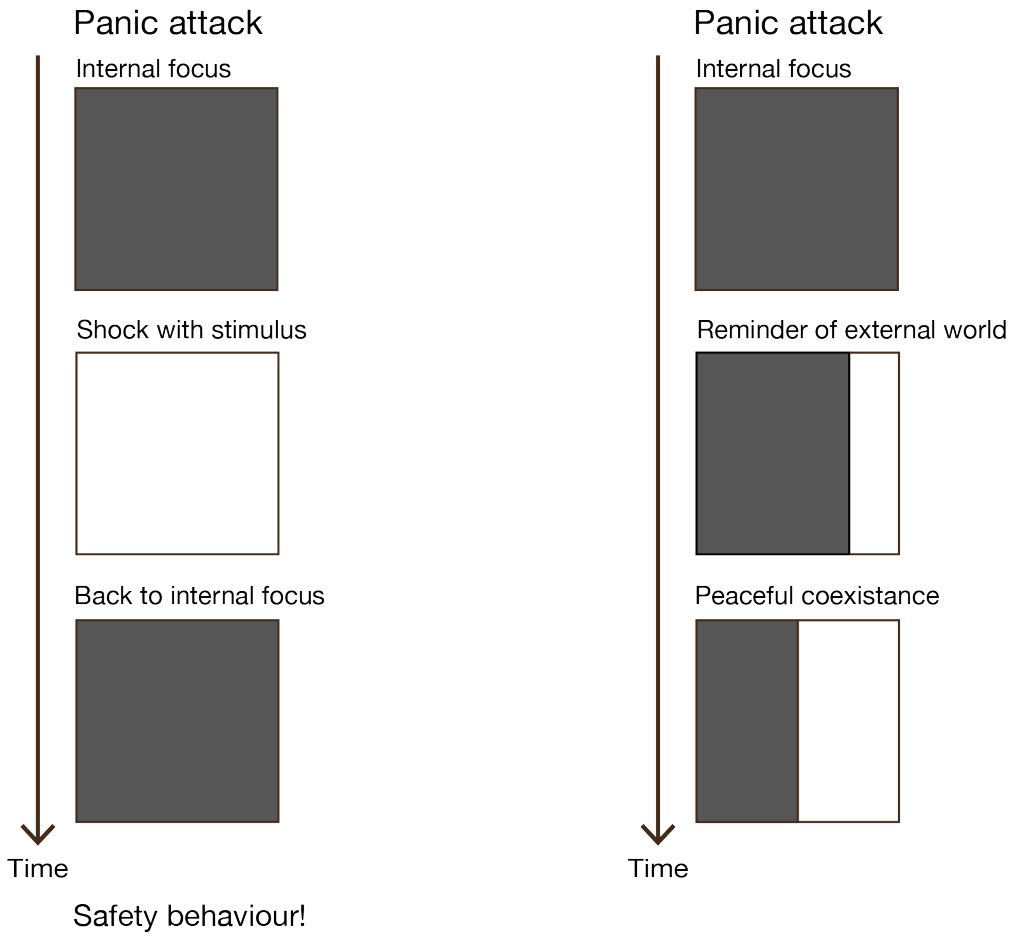


Figure 12.2: An illustration of our interpretation of how to not design a product that becomes a safety behaviour by establishing an acceptance for the panic attack and create a peaceful coexistence between the panic attack and an external stimulus.

12.4 INTENDED USE AND LIFECYCLE

As previously stated, our aim is to make a product that at last makes itself redundant. Thus, the idea is that the user gets the product, use it to help deal with their panic attacks and then learn something from it, making it possible to let go of the product. Therefore, during the intended life cycle of the product there is a shift in power, from the product helping them in their difficult situation, to them to helping themselves. Furthermore, since panic attacks and panic disorder are complicated conditions, we think that it would be positive to use the product together with a therapist that can guide the person in the use of the product.

12.5 POSSIBILITIES AND LIMITATIONS

With a basis in investigation done, both possibilities and limitations for a future product can be stated. Possibilities are the existing therapies that can serve as inspiration for the development of a product, whereas limitations are the risk of creating a safety behaviour as well as being able to create a product that is helpful.

POSSIBILITIES

- Many people do not experience that they get sufficient help from the healthcare system to deal with their panic attacks. Thus, there is room for a product helping them as a compliment to therapy and medication.

- Acceptance and commitment therapy and mindfulness is used to help people be present in the moment without letting their thoughts take over. Thus, this implies that it is possible shifting focus from thoughts to something else. Furthermore, learning how to be totally "*mindful*" is hard and a product helping the user do this would probably be beneficial.

LIMITATIONS

- People suffering from panic attacks often use safety behaviours, safety objects and safety persons. According to expert 2, physiotherapist and psychotherapist, these safety behaviours can maintain anxiety and fear. She stated that one must instead accept what is going on and understand that the threat is not real in order to alleviate panic attacks. Furthermore, Carlbring and Hanell (2011) state that safety behaviours keep the persons suffering from panic attacks from discovering and meeting their negative thoughts, thus maintaining and amplifying fear. Thus, the solution that is developed must not become a safety object or encourage a safety behaviour.

- During a panic attack, some persons become very distant and have a hard time connecting with reality. Some also report experience of impairment of their visual and audial senses. Thus, the product must take into consideration that the person using the product can have a hard time using it if this is too demanding.

- There are several apps on the market aiming to help people suffering from panic attacks. However, only one person stated that they have used an app to deal with panic attacks. Thus, this raises questions on the efficiency and desirability of an app solution. Apps may be based on good theory on how to deal with panic attacks and include good exercises, but as the user study shows that people are not inclined to use them, there seems to be something missing from an app solution. Expert 3, psychologist, stated that the brain gets easily bored with two-dimensional images, suggesting that this media might not be suitable for turning the focus on oneself to a focus of the outside world.

12.6 GENERAL NEEDS

In summary of what has been stated in the investigation above, the general needs of the users that future product should fulfil are:

- The product should help the user to let in the present, being consciously aware of what is happening in this very moment. That is, the product should assist the user in being mindful, thus, focusing on what is happening in the moment rather than on the bodily reactions and catastrophic thoughts.

- The product must not extinguish the inner dialogue and exclude the panic attack, but coexist with it, giving space for reality but also reflection upon thoughts and symptoms. This is to make the person normalise their panic attack and to not create a safety behaviour or object.

- The product should not create a dependency on it for the user in a long-term perspective, but instead teach the user how to handle their panic attacks without the product.

- The product should offer a *snap out* effect, helping the user connect with the reality and refocus, as well as offering a calm down effect and a sense of not being alone, helping the user to calm down and feel better about themselves.

- The product should have a shape, size and weight that facilitate the device being carried in a pocket, purse or briefcase.

TABLE 12.1: THE NEEDS OF THE PERSONAS

	Attribute of persona	Context	Need
Heart Attack Henry	Thought he was having a heart attack the first time, still fears it and over interprets fast heartbeats.	At work.	Something that makes him dare facing his fears and avoids avoidant behaviour. Concretise therapy.
Ashamed Ashley	Afraid of making a fool of herself. Panic attacks manifested by a strong urgency of needing to go to the bathroom.	In school.	Support, compassion, helping hand to get through a panic attack, to dare going to school, information that her symptoms are not weird.
Exhausted Emilia	History of exhaustion disorder and started getting panic attacks. Accepts herself as she is now.	Anywhere	Support her in doing exercises to maintain her mental health such as ACT and mindfulness.
Losing Control Lisa	Feels unsafe and insecure and does not believe she can handle situations. Large need for safety persons. Thinking she will lose her mind is the worst.	At home.	Break the feeling of derealisation and depersonalisation, information on that she will not lose her mind. Help in getting free from safety persons.
Detached Daniela	Feels detached, disoriented during an attack, hates the feeling.	Anywhere.	Break the feeling of derealisation and depersonalisation, a healthy alternative to being self-destructive to get back control over her body.

- The product should empower the user in order for them to feel that they regain control in the panic attack.

- The product should be able to withstand the handling of a person in a panic attack state of mind. This could include not being able to see properly and dropping the product, or not being fully aware of how hard one is squeezing with their hands.

12.7 THE NEEDS OF THE PERSONAS

Asides from the general needs, each persona has their own set of specific needs due to the different characters of their problems. In table 12:1, the specific needs of the personas are presented.

POSSIBLE CONFLICTS OF NEEDS

- Heart attack Henry and Ashamed Ashley want a product that is not visible to the people around them whereas Exhausted Emilia would like a product to function as a platform for a discussion on mental health in today's society.

- Losing control Lisa and Detached Daniela needs a product to snap them out of feeling of derealisation, depersonalisation and feeling of going crazy whereas Heart Attack Henry and Ashamed Ashley needs support to face situations they fear and Exhausted Emilia wants a support in her work to maintain her mental health.

- Ashamed Ashley wants a companion, as she is lonely whereas Heart Attack Henry is scared of being perceived as weak.

TABLE 12.1: THE NEEDS OF THE PERSONAS

	Expression	Product's function	Keep and use
Heart Attack Henry	Discrete or expression from other category of products such as sport or medical equipment.	Guide through, concretise his mental problem, and remove focus from the heart symptoms.	Hideable in briefcase/pants pocket.
Ashamed Ashley	Discrete or expression from other category of products such as office supply/device for study techniques.	Companion and guide through.	Hideable in school backpack/pocket.
Exhausted Emilia	Can signal that it is a product against panic attacks, can function as a conversation starter.	Help with staying in the present.	Visible.
Losing Control Lisa	Neutral, prefers if it is not obvious that it is a device associated with panic attacks.	Snap out, give consistent feedback to action.	At home, in bedside table or drawer.
Detached Daniela	No opinion.	Snap out.	Wearable (forgets about medicine) but not too obvious.

12.8 MOVING FROM PROBLEM TO SOLUTION

As previously stated, the main problem is the internal focus on thoughts and bodily reactions in relation to a panic attack. So far, so good, but how should this problem be tackled? One can imagine many different approaches to solving this problem, and the three ways that we were considering were a cognitive approach, a biological approach and a sensory approach.

THE COGNITIVE APPROACH

One can imagine having a product that helps one get through a panic attack by using one's thoughts as an instrument. Maybe there could be an app or a book presenting information on how one can think in a certain situation or what actions that would be preferable to take. This could help the person think in new thought patterns and in the long run battle the panic attacks. However, there are already apps on the market aimed for persons with panic attacks, and they do not seem to be used by the persons responding to our survey or those we have interviewed. Furthermore, we are not psychologists or therapists and therefore we are not equipped with the expert knowledge that might be needed to develop a product aimed to change the thought patterns of a person.

THE BIOLOGICAL APPROACH

Since the panic attacks are ultimately about a reaction in the brain, one might be able to prevent or inhibit an attack by changing the focus in the brain by a method based on the biology of the brain. For example, expert 3 (psychologist) stated that memories have a special power to inhibit a panic reaction, and thus, there seem to be a possibility to affect specific centres in the brain as a means to fight off panic attacks. However, expert 4 (psychiatrist) stated that the brain more complicated than that, and since psychiatry and neurology is not our forte, this road could be very complicated, if not impossible, for us to walk down.

THE SENSORY APPROACH

The interface between our mind and the world around us is our senses and sensory impressions happen in the present. Thus, a way of turning the focus from thoughts and bodily reactions to the present world around us could be to give input to the senses. In addition, the sensory impressions happen in present so in order to create a tool one could for example use a smell, haptic inputs, or sounds as a way of diverting the attention. In opposite to the cognitive approach and the biological approach, the sensory approach is right up our alley with respect to the knowledge base we have. Thus, we have the tools to make a product based on sensory inputs as a way of helping people suffering from panic attacks.

12.9 CONCLUSION OF PART 1: FRAMING THE PROBLEM

The effect of the product should be to break the internal focus on thoughts and bodily reactions by including the external world around the user in the present. This should be done by giving the user a sensory input.

END OF PART 1

Framing the problem

PART 2

Concept development

So, the effect of a product against panic attacks should be to break the internal focus on thoughts and bodily reactions by including the external world around the user in the present. In addition, it is to achieve this by giving the user a sensory input. Sensory inputs are however a very wide concept, ranging from listening to music to feeling the touch of another person. Thus, a more precise definition of what the product should do must be developed. Below, the overall aim and method of *Part 2: Concept development* is featured. In this section, every chapter also has its own more detailed aim and method.

The chapters included in *Part 2: Concept development* are:

Chapter 13: Exploration of the senses
Chapter 14: Ideation of haptics
Chapter 15: Exploration of haptics test
Chapter 16: Filling the void
Chapter 17: Haptic evaluation tests
Chapter 18: The final concepts - Fighting panic with haptics!

AIM OF PART 2: CONCEPT DEVELOPMENT

The aim of *Part 2: Concept development* was to explore how sensory inputs can be of use during a panic attack, as well as develop and evaluate concepts that fulfill the effect defined in *Part 1: Framing the problem.*

METHOD OF PART 2: CONCEPT DEVELOPMENT

By doing ideation and conducting explorative tests, product concepts could be created. These concepts were then evaluated by users to verify their effect.

13. EXPLORATION OF THE SENSES

The development phase started where the investigation phase ended: the investigation of possible solutions from sensory input. In order to see what direction to go, exploration of how to create snap out effects with different senses or activities was investigated.

13.1 AIM

The aim of this study was to investigate if a sensory stimulus could help the users include the world around them, leaving less room to focus on anxious thoughts and symptoms, as well as investigating the possibilities of helping a person *snap out* of a panic situation and calm down. Furthermore we wanted to explore what types of sensory inputs that can be effective in helping the person refocus their attention without creating a safety behaviour, i.e. without completely extinguishing the panic attack and without taking away the ability to reflect upon the feelings and emotions they have. Our hypothesis was that a sensory stimulus could be used to turn the focus of the person in a panic attack, from the inner pain to the sensory stimuli.

13.2 METHOD

Since provoking panic attacks without a permit is both illegal and unethical, we had to find another way of act out the conditions of a panic attack in order to test whether or not a sensory input could deflect the attention from the panic attack. We decided to focus on recreating a strong bodily sensation drawing the attention in a similar way as a fast pounding heart or a sensation of shortness of breath. The bodily sensation chosen was pain, since this draws a lot of the participants' attention and is simple to create. The pain-giver was decided to be a paperclip since this creates a strong pinch without inflicting damage. The area subjected to the pain was decided to be the earlobe since this is an area sensitive to pain, yet not too fragile.

When choosing the inputs used in the test, we wanted to have a broad range of experiences involving both sensations that was likely to have a *snap out* effect as well as sensations that we thought was going to be more calming. Since we had heard that lemons and ice are used in healthcare to help patients *snap out* and refocus, those were granted a spot in the test. We also wanted to explore additional taste and haptic experiences to compare to the lemon and the ice. We decided to use chilli as one of the taste sensations and very bitter tea as the other to test different strong tastes with the potential to help a person *snap out*. For the haptic inputs we wanted to test the opposite of cold, i.e., warmth, which we believed would have a more calming effect, as well as an input not relying on temperature. For this purpose, we decided to use vibrations since we believed this to be a relatively strong haptic sensation with the potential to draw the user's attention. As an ultimate *snap out* trigger we wanted to test if a dramatic and involuntary bodily reaction could help end a panic attack. Thus we tested sneezing as one of the inputs. With inspiration from expert 3, the psychologist, we also wanted to try the effect of recalling a memory as a means for calming down and refocus. To further explore the cognitive aspects of refocusing from a panic attack another input was performing a task. Finally, we wanted to test if motoric exercise could have a calming effect on the participants.

We consciously avoided visual input since expert 3, the psychologist, stated that you easily get tired and bored of visual input presented on a two-dimensional surface, thus making this unsuitable to use for making people focus on the input. Furthermore, we avoided auditory input since we believed that there is a great risk of extinguishing the inner dialogue if the person is listening to something. Moreover, both visual and auditory inputs rely on senses that can be weakened during a panic attack, i.e. the vision and the hearing.

PARTICIPANTS

Although we considered the test safe, we did not want to risk any discomfort in participants and thus decided to make the test only on ourselves, the authors of this report. This also enabled us to have an explorative and experimental test setup and see where the sensory inputs led us. We could quickly evaluate the potential of the inputs to see what we could keep working with.

SENSORY INPUTS

The warm input was created by filling an aluminium can with hot water and having the participant hold their hands around it. The cold input was created by a damp paper tissue, held against the chest or neck. The vibration input was created by calling an IPhone 4 and the phone was held in the participant's hands. The lemon and chilli inputs were created by having the participants eating a wedge of lemon and a slice of red chilli respectively. The bitter tea input was made by brewing very concentrated Lipton earl grey tea and giving it to the participants to drink. The two activation tasks involved the participant going to another room to retrieve an item and searching the web for an image respectively. The recollection of a memory task was done by having the participant recollect and recite a memory. The sneezing was induced by having the participant inhale finely ground white pepper, and the moving of the foot was done by instructions from the test leader.

PROCEDURE

The test setup was as follows:

- A paper clip was applied to the earlobe of the participant, inflicting pain.
- The participant rated the pain from the paperclip on a scale from 1-10, where one represented no pain and ten represented the worst pain ever felt by the person, and the result was noted.
- The participant was subjected to the input.
- The participant rated the pain while subjected to the input, and the result was noted.
- The participant was also asked for how long the effect of the input lasted, and if she experienced that the input extinguished the pain rather than coexisted with it, or vice versa.

The result was then analysed by plotting the inputs on a graph with long/short duration time on the y-axis and extinguishing of pain/coexisting with pain on the x-axis.

13.3 RESULT AND ANALYSIS

The results from the tests of the different senses and activities on how effective they were on blocking out the pain, as well as implications for a future product against panic attacks are presented below.

HAPTIC INPUTS

When heat was applied while having the clip causing pain, the experienced pain went down from a nine to a seven for both of us. Furthermore, the change in experienced pain was not instant, but rather gradual, and the input was experienced as pleasant. The cold input was also experienced as rather pleasant, but had a larger effect on the pain. For one of us, the pain went down from a seven to a two, and for the other the pain went down from a nine to a tree. However, the pain relief was more temporary with the cold input than the warm input, maybe because the damp tissue lost its cold temperature fairly fast. The vibration input made the pain go down from a nine to a six or seven dependent on where in the vibration pattern the participant rated the pain, stating that the vibrations indeed made her focus less on the pain, without extinguishing it completely.

The two haptic inputs warmth and vibrations had a long lasting effect, and was experienced as coexisting with the pain rather than extinguishing it. Thus, the inputs given from warmth and vibrations were not strong enough for the pain to be totally extinguished, but rather made the pain more tolerable and easier to endure. We experienced both warmth and vibrations during a long period of time, thus the effect can be long lasting. Furthermore, the vibration and warmth were also combined to test if the combination of the two would give more than the parts by themselves, but the combination fell short of the expectations and the two inputs did not benefit from each other.

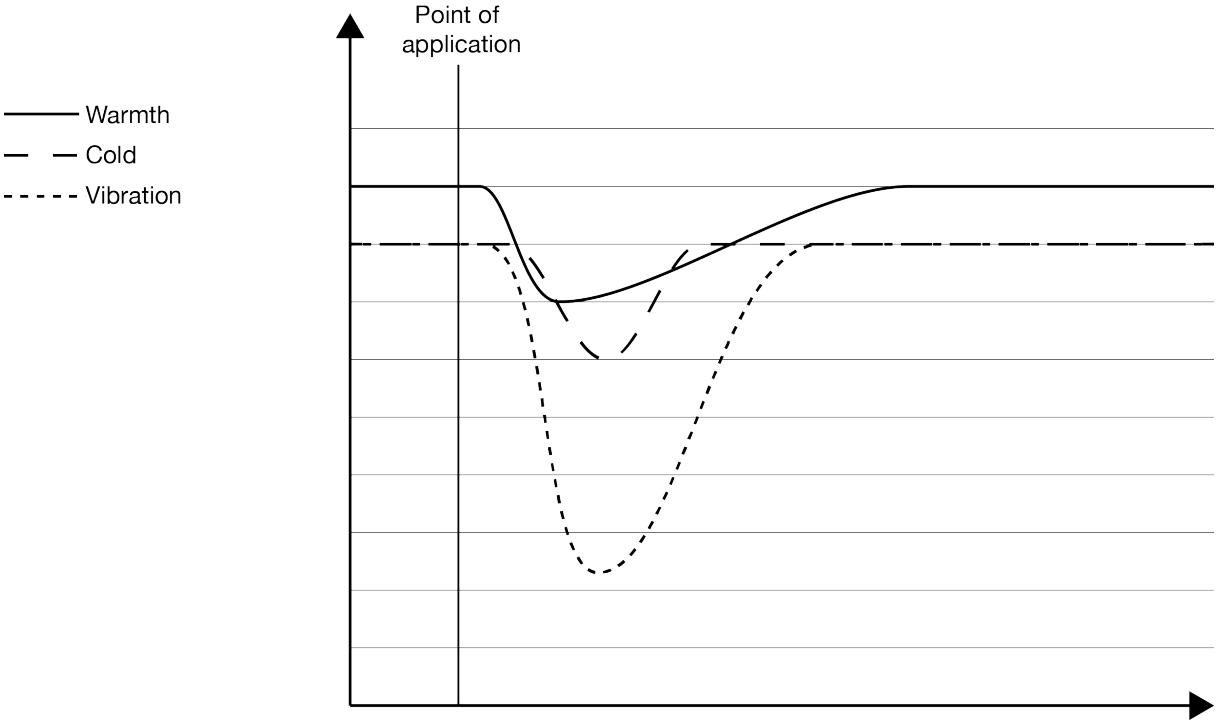


Figure 13.1: Haptic stimuli: warmth, cold and vibration.

TASTE

The taste session of the senses test was beyond doubt the most exciting and surprising. When biting into the lemon the experienced pain went from an eight to a two to an eight again for one of us and from a six to a two to a seven for the other. Thus, the pain was nearly extinguished by the sensory input given from the lemon. However, the pain relief was very brief and the pain returned as soon as we stopped biting into the lemon. Another exciting finding was that one of us experienced pain relief before biting into the lemon, and described it as the focus on the anticipation of the sour flavour lowered the pain from a seven to a four. Furthermore, one of us experienced that the pain reduced the sourness of the lemon. Thus, it seemed as the two inputs extinguished each other.

Figures 13.2 and 13.3: The authors of this thesis tested how the level of pain was affected by biting into lemons.

When biting into a slice of chilli, the pain went down from a seven to a two for one of us, and from a seven to a four for the other. In opposite to biting into a lemon, it took longer for the chilli to kick in and the effect lasted longer. However, the experience was not very pleasant. Although the chilli was quite effective removing the pain in the earlobe, it also caused pain in the mouth, and the pain relief in the ear seemed to be replaced with the pain in the mouth.

The bitter tea lowered the pain from a seven to a six for one of us and from an eight to a six in the other. Overall, the bitter tea did not have any major impact.

Both the lemon and the chilli seemed to be good tools to use if one wants to extinguish the pain, however the effect does not last very long. Maybe the shock effect of both the lemon and the chilli is what makes it so effective in extinguishing the pain, but at the same time makes the impression so short-lived.

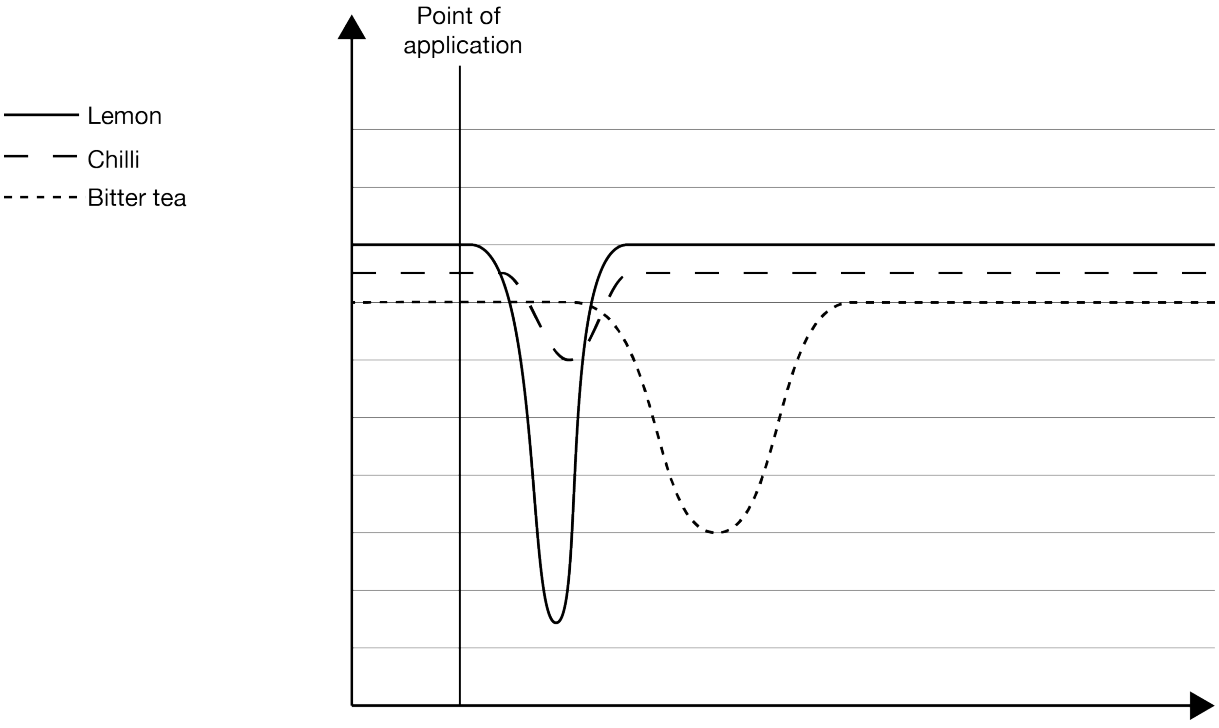


Figure 13.4: Gustatory stimuli: lemon, chilli and bitter tea.

COGNITION

The different tasks were done by only one person each. Walking around the office, and fetching an item resulted in a decrease of pain from an eight to at minimum a five. Dependent on what obstacles that the participant met, e.g., opening a door or walking down stairs, the experience of pain went up and down until the task was over. Furthermore, the pain was lowered permanently after the task from an eight to a seven. However, this could also be a result of adaptation to the pain caused by a long exposure, rather than the task making a permanent difference in how one experience pain.

The task involving searching for a picture on the Internet lowered the pain from a nine to a seven, but as soon as the task was finished the pain relief disappeared.

Reciting a memory lowered the experienced pain from a nine to a six, and as for walking around the pain relief was permanently lowered one increment to an eight.

The tasks and memory inputs extinguished pain rather than coexisting with it, and the effect lasted as long as the task was performed. In our opinion, the most interesting result from the cognitive input test was that self inflicted stimuli like reciting a memory or walking around can draw the attention and focus away from the pain. Thus, there is necessarily no need for external input to make a person refocus his or her attention. However, it seemed critical for the participants to not know what task that she should perform to maintain focus on the task. Also, she experienced that the pain was constantly knocking on the door and that a brief moment of not focusing on the task caused the pain to return. This is clearly shown in the graph for the task of "walk around" where the experienced pain goes up and down depending on where the participant walked and what sub-tasks were done, e.g. opening doors.

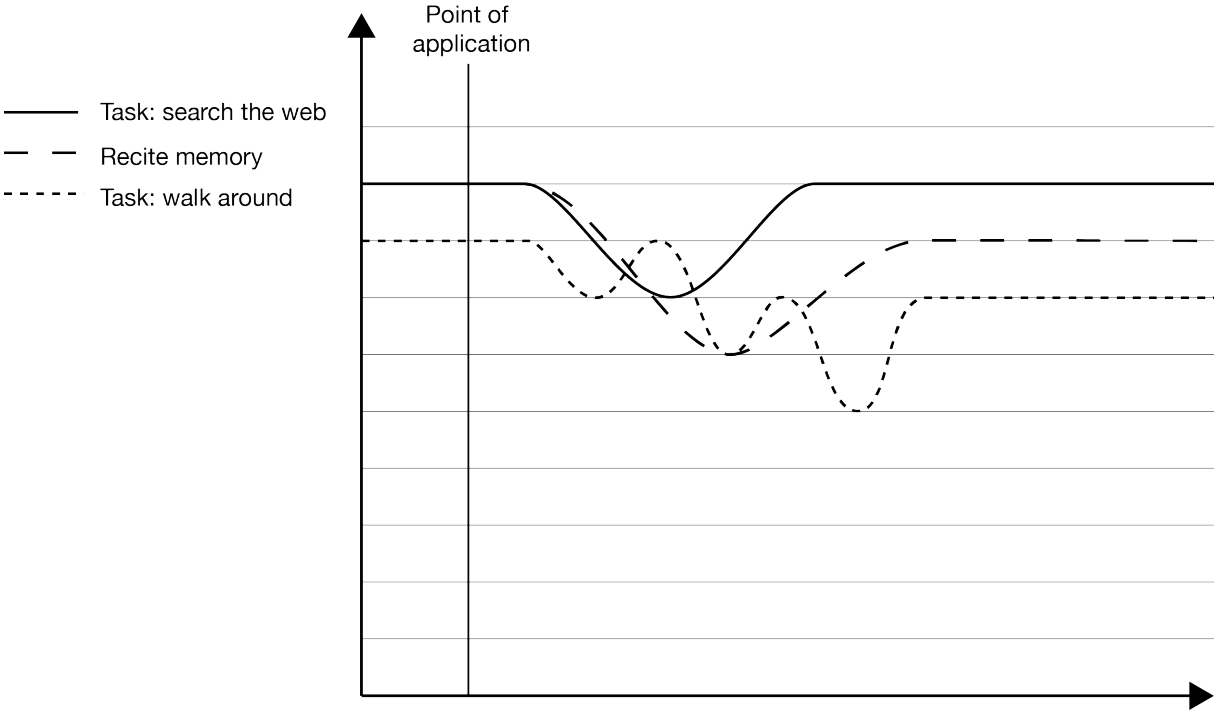


Figure 13.5: Cognitive tasks of searching the web, reciting memory and walking around.

INVOLUNTARY REACTION

As for biting into a lemon, inhaling pepper and sneezing reduced the pain dramatically for a short period of time. The pain was lowered from an eight to a three for one of us and from a nine to a four for the other, and again, as for the lemon the sneezing extinguished the pain rather than extinguishing it.

MOTORIC

The moving of the foot input was done by only one person, and she experienced the pain drop from an eight down to a six. Overall, the effect of moving the foot was very undramatic. The input was experienced as neither extinguishing the pain, nor coexisting with it, and neither long lasting, nor short lived.

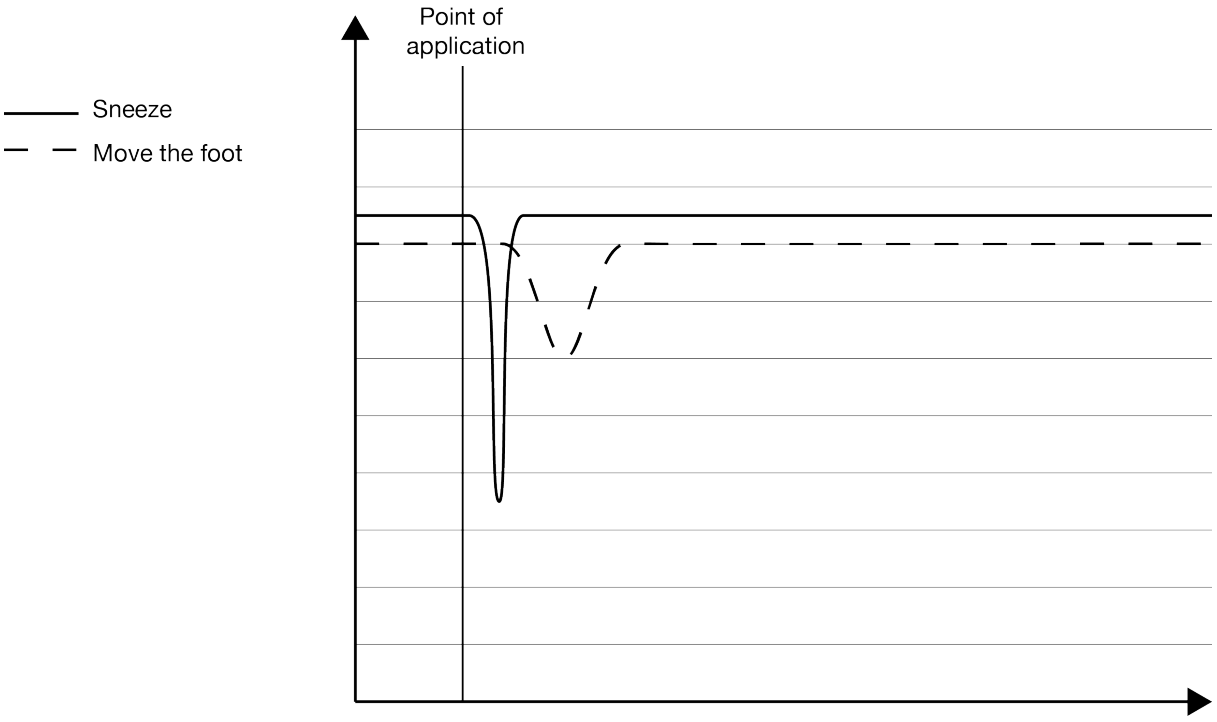


Figure 13.6: Sneezing and moving the foot.

DURATION OF TIME - RELATION TO PAIN

In conclusion, the different stimuli were plotted against their duration time and how they relate to the pain, please see figure 13.7.

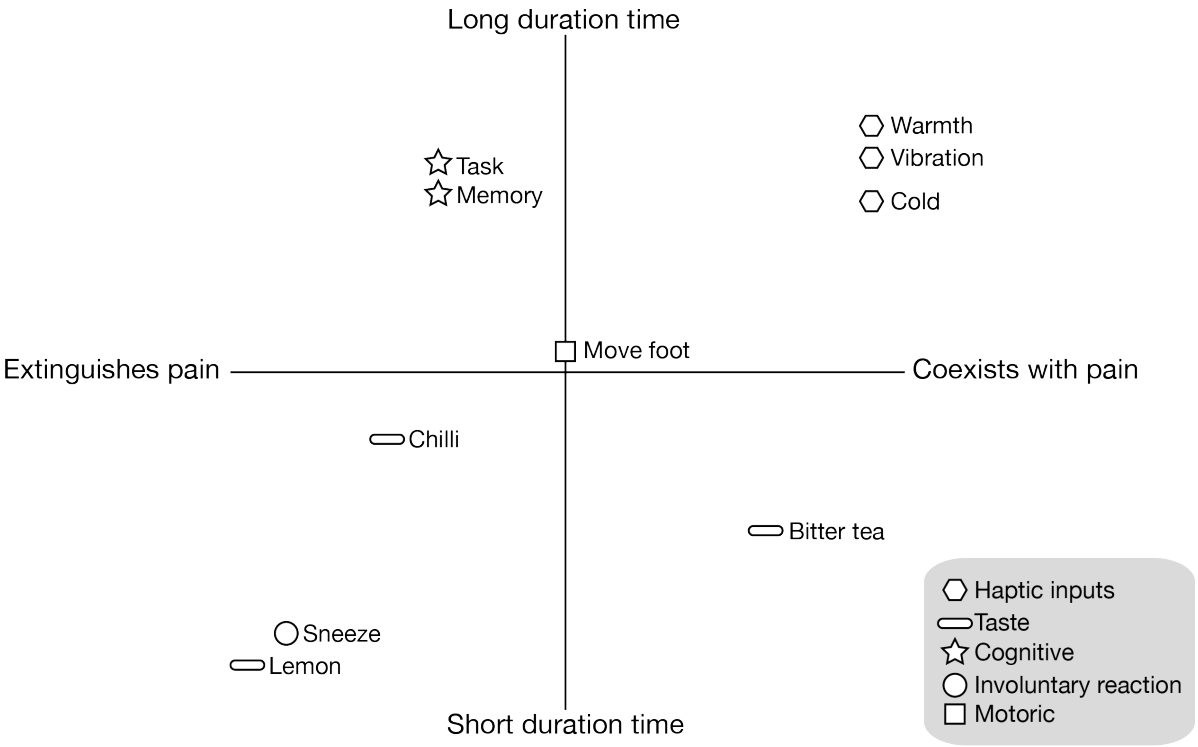


Figure 13.7: The graph of the effects of the tested stimuli concerning their duration time and relation to pain.

13.4 REFLECTIONS

What implications the tests have for a future product against panic attacks is discussed below.

POSSIBLE APPLICATIONS OF DIFFERENT SENSORY STIMULI

In general, the effect of the different inputs relied on how much of the attention and focus the input had drawn from the participant. Overall, it seemed as an uncomfortable input such as biting into a lemon and a chilli had the power to extinguish the other uncomfortable input, i.e., the pain. Thus, the uncomfortable stimuli does not seem to be appropriate tools for helping persons include their surroundings and leaving room for reflections and processing of their panic attacks. However, an uncomfortable stimulus or input might be an effective tool to help these persons *snap out* of the panic state of mind before being introduced to a stimulus helping them include their surroundings and still leave room for processing the panic attack.

The more comfortable inputs such as holding a warm or vibrating item appeared to make the uncomfortable pain more tolerable and easier to deal with, rather than making the pain go away completely. Thus, these comfortable, and on the verge of cosy, inputs appeared to have the power of helping the person include the surrounding world and make the uncomfortable input easier to deal with, and help the person calm down. The input of performing tasks however does not fit perfectly into the pattern of uncomfortable input extinguish the pain and comfortable input coexisting with the pain. Doing a task was experienced as neither comfortable, nor uncomfortable, though doing a task was experienced as extinguishing pain.

PRODUCTIFICATION

During the tests it became clear that the different sensory inputs have different potentials for productification. The inputs that we saw as the most challenging to productify were inputs relying on taste and involuntary reactions. The strong taste sensations already exist as natural products such as lemons or chilli, and even though one could argue that a pill with a strong flavour would be more practical to keep in one's back pocket, we as designers and engineers have a limited ability to make the product considerably better and more effective than the natural product. A product based on taste will most likely be a one-time use product since the product would be consumed after each panic attack. We believe that it would be more interesting creating a product that can follow the user in its journey, making the user create a relationship with it. In the case of using sneezing as a way of *snapping out* of a panic attack there are other problems. Inhaling a substance making you sneeze appears as a very invasive method of getting rid of a panic attack, and as for the taste inputs, a product based on inhalation would probably also be consumed in the use. Furthermore, though the inhalation of the sneezing agent can be made more sophistically, for example like a nasal spray, sneezing is not a very discrete way of managing panic attacks. However, the biggest downside that we saw in products based on taste or involuntary reactions is the fact that the experience is uncomfortable. This might lead to the user not using the product due to the discomfort. In spite of the possible benefits of a sour taste or a sneeze, the last thing one would probably want in a panic attack is more discomfort.

The cognitive inputs also raised questions regarding productification. One of the problems in this case was the presentation of the task. Since the efficiency of the task seemed to rely on the task being unpredictable, the task must be presented at the time of the panic attack. Thus, the task would probably have to be presented on a phone, either audial or visually, or visually on some sort of card. These presentation forms poses problems since, as previously stated, those senses are less suitable to use in a panic attack situation. What speaks in favour of the task, as a viable way of extinguishing panic attacks is the fact that one of the interviewees stated that she reads books to ward of her panic attacks. Thus, at least for some people, it is possible to use the visual sense and concentrate on a task even though the person is in the middle of a panic attack. Furthermore, the cognitive input in the form of a memory encourage the user to turn his or her focus back in time, thus losing the intention of helping the user be in the present.

The haptic input seemed to be easier to productify since the experience only depends on a sensory input applied to the body. Thus, the user does not have to go through a complex procedure or take in information. Furthermore, developing a physical object giving a sensory stimulus is a territory that is more familiar to us as designers and engineers, and therefore we felt a productification of such an experience would make the most out of our competence. The downside to a product giving haptic input is that the product can be visible to others since the haptic input demands a physical object to deliver the experience.

All sensory inputs have their advantages and downsides regarding the subject of productification, and all of the inputs appear to be possible to productify. However, all and all, the haptic stimuli showed the most promise for productification since these inputs do not demand a large or uncomfortable effort from the user, but seemed to have potential in coexisting with pain. In addition, the haptic media is favourable for our area of expertise, as there are endless possibilities of creating products using haptic inputs.

THE RISK OF SAFETY BEHAVIOURS

A product against panic attacks will always pose a risk of creating a safety behaviour, as do using a medicine or calling a friend when the panic is on the rise. Our way of tackling the issue is to create a product that balance the fine line of helping the user get through a panic attack, without completely extinguishing the panic attack. This in order to not make our product a magic way out of the panic attack and thus sustaining the fear, leaving the thoughts and emotions unprocessed.

As previously stated, the lemon and chilli inputs blocked out the pain completely. If blocking out pain is a valid analogue for blocking out a panic attack, these use of inputs could pose a risk of becoming a safety behaviour. On the other hand, the haptic inputs coexisted with the pain rather than extinguishing it, thus running a smaller risk of becoming a safety behaviour.

13.5 CONCLUSION

In this study it was shown that a sensory input can have the ability to help a person feel less pain, and make the pain easier to tolerate. Thus we think that it is likely that a sensory input also can help a person get relief from a panic attack, either by making them focus far less on the panic attack symptoms or by making the symptoms easier to handle. We also believe that it is possible to make a product that have a lower risk of becoming a safety

behaviour by using a haptic input that does not extinguish the symptoms and leaves room for reflection. Furthermore we believe that it is possible to productify the haptic input in order to make a product that is adapted to the use conditions of a panic attack.

The study also showed that attention and focus is important factors when trying to affect pain levels and, if our assumption of panic attacks being analogue to pain is true, also panic attacks. Inputs that steal a lot of the person's attention, such as the chock of biting into a lemon, have the power to lower the level of experienced pain. Inputs that instead are not stealing all of the person's attention rather have the power to make the pain less troublesome rather than lowering the experienced pain level dramatically.

In conclusion, the sensory input showing most promise is haptic experiences. The haptic inputs does not extinguish the pain, and thus leaves room for an inner dialogue as well as making it less likely to become a safety behaviour.

GUIDELINE

- The product should be based on haptic feedback to maintain the possibility for the user to reflect upon the panic attack, as well as minimising the risk of creating a safety behaviour or safety object.

14. IDEATION OF HAPTICS

As haptic inputs were deemed to have good potential in a product against panic attacks, an ideation process of how to design for haptic impressions was needed. This chapter investigates different haptic inputs as well as the relationship that should exist between the user and the product in order to find a balance that is suitable for a product against panic attacks.

14.1 AIM

With the result from the exploration of how the senses can be used to achieve a break of the internal focus as a basis, this section aims to investigate how haptic inputs can be used in the most effective and pleasant way. This includes both investigating what kind of haptic input that is the most effective, as well as investigating how the product could affect a person's behaviour. Thus, the aim of this section is to design a behaviour of the user, creating use concepts.

14.2 METHOD

In the previous test, the haptic inputs, i.e. heat, cold and vibration proved to be the most promising. When investigating the haptic inputs further we started with these very inputs but in a more polished form. These were created by an Ovo K1 Rabbit Vibrator, a heat retaining wheat cushion and a plastic glove filled with cold water. These inputs were then applied to different parts of the body to investigate where the haptic input felt the most pleasant, and the different inputs were combined to investigate if they added to each other's effect.

A design process also started, investigating other shapes, sizes and textures of the haptic inputs, and different ways of allocating the initiative when using the product, i.e., is the user or product active or passive? The design process included simple prototyping and testing as a way of generating ideas and putting them to the test.

PARTICIPANTS

The participants during this test were we, the authors, as in the previous tests. This gave room for exploring the area and make spontaneous prototypes and developments, rather than testing a finished concept.

14.3 RESULT AND ANALYSIS

The ideation process focused on investigating the relationship between the product and the person in terms of where on the body a haptic input should be given, and what kind of input is suitable in that placement. In addition, the ideation dealt with the relationship between who should be active and passive between the person and the product. The product should help against a specific panic attack in the short perspective, while at the same time, empower the user enough for them to deal with the cause and recurrence of panic attacks in the long term perspective. In order to ideate, models were created that represented the ideas.

THE RELATIONSHIP BETWEEN THE PERSON AND THE PRODUCT

The relationship between the user and the product concerns both where the product should operate as well as who has the active/passive role of the person and the product. The ideation tests tried to separate the different aspects in order to evaluate their potential for a product against panic attacks.

WHERE ON THE BODY

In order to move on with the product development work with wanted to narrow our scope with respect to where on the body the stimuli should be used. Thus, we wanted to investigate how different sensory inputs are perceived on different parts of the body. Furthermore, the placement of the product on the body does not just narrow the scope of possible product functions, but is also a key factor in how one experiences the relationship with a product. For example, a product that one wears underneath one's clothes becomes way more intimate that a product that one keeps in one's purse.

Heat

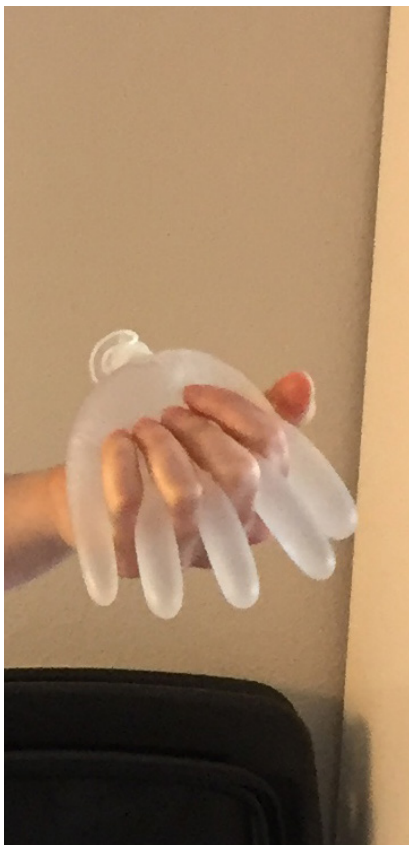
First up was the heat input, and as previously mentioned, this was created with a heated wheat cushion. The cushion was applied to different parts of the body, e.g., the chest, the legs and the shoulders while the participant evaluated the sensation. Having the heat on the chest while lying down felt very nice and relaxing (please see figure 14.1), and the fact that the cushion was relatively heavy added to the calming sensation. The input was associated with having a baby on one's chest and we felt as though we could not go up and stress about since we had this precious thing on our chest, resulting in a calm and relaxed feeling. When placing the heat cushion on the shoulders, the input was experienced as relaxing, but when the cushion was held in the hands, it did not result in any major change of mood. Instead, holding something warm in one's hand might be uncomfortable since this can cause hand sweating.

All in all, the heat was experienced as calming. Furthermore, the heat gave associations of another living being which gives the feeling of compassion. Another finding was that the warm sensation stayed on the skin, leaving a pleasant feeling of warmth even after the cushion had been removed.

Figure 14.1: Testing a heat cushion on the chest.

Cold

Next up was the cold sensation that was created by using a plastic glove filled with cold water. The cold glove felt very good and calming on the forehead (please see figure 14.2 and 14.3), but what really caught our attention was the shape of the glove. When held in the hand with the "fingers" of the glove tucked between one's fingers, the shape and weight created the pleasant feeling of holding hands with another person (figure 14.3). Moreover, due to the liquid consistency and the fullness of the glove, it adapted itself perfectly to the hand, thus creating a lot of contact between the product and the person, which felt good. Overall, the glove when being held in the hands created a feeling of calmness and compassion and gave the impression of being something to hold on to. In the context of a panic attack, it seemed this could be an input with the possibility to guide the user through a panic attack.

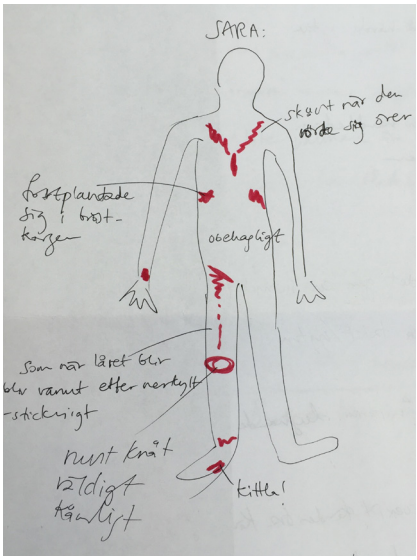


Figures 14.2 and 14.3: Testing cold liquid in a glove.

Vibration

Finally, the vibration input was tested. This was primarily done by having the participant lying down while the other of us placed vibration on different parts of the participant's body. This input proved to be experienced very differently by the two of us. One of us experienced vibrations on the chest as delightful while the other thought it was uncomfortable and scary. Vibrations on the feet were experienced as tickling by the one of us who liked vibrations on the chest, whereas the other one had the opposite experience, that vibrations on the feet were pleasant and the chest unpleasant.

Moving the vibrating device along the body was experienced as pleasant by the one of us who liked vibrations on the chest while the other one of us thought it reminded her of the tingling sensation in the body from having a panic attack. However, both of us liked vibration on the wrists, hands, arms and legs. When in a panic attack, the vibration input could be a useful tool for achieving a *snap out* effect due to the strong sensation it creates.



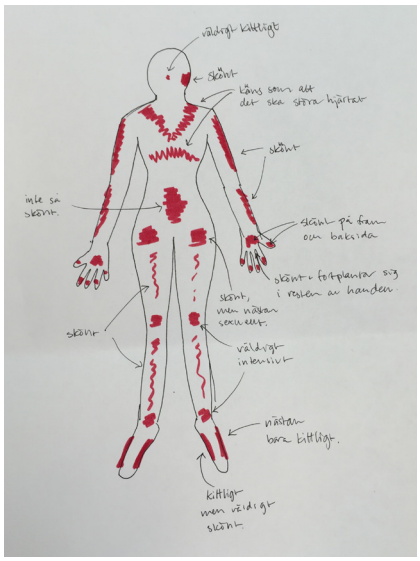


Figure 14.4 and 14.5: Sketches of the experience of being subjected to vibration on different places on the body.
Figure 14.6: Testing a vibrating product.

Heat and vibration

Since the combination between warmth and vibration in the previous test round did not work out that well, we wanted to give it another try. Thus, the plastic glove was filled with warm water instead of cold, and the inputs were combined. However, the combined input failed to impress us again, and the two inputs did not seem to magnify each other in any way. Instead one could only feel the heat and vibration separately, with the vibration input slightly overpowering the heat input.

Figure 14.7: Combination test with heat and vibration.

Reflection

In the test it became clear that haptic inputs could be used successfully on different places on the body. However, the different places induced different feelings, and when using the vibration input, the same vibration could create strongly positive reactions at one place of the body and strongly negative feelings on another.

The placement of the input on the body can also have a large impact on how powerful one feels in a situation. If the input is presented in a way that takes away the user's control of the situation, e.g. as in the test with the heat cushion was worn on the chest and the user was inhibited to stand up, the user might feel a sense of powerlessness. This might not be a problem in a situation where one is not experiencing a panic attack, as in the tests done in this section, but when in a panic attack the person is already in a very vulnerable and powerless state and an addition to this feeling would not be preferable. Furthermore, having a product that one cannot easily remove, e.g. something that one wears on one's body, might create the same sense of powerlessness. Instead, the body parts that we considered being a symbol of power and action are the hands. When using the hands, one can manipulate the object as one wishes and one can put it away if one wishes. Furthermore, the hands contain a high concentration of nerve endings (theguardian.com, 2014), making them a perfect place for a product giving haptic input.

ACTIVE/PASSIVE PERSON/PRODUCT

The next question to be answered on the topic of how to use the product is whether or not the product should be active or passive. For example, a stress ball is a passive product that just offers a satisfying texture for the user to fiddle with, while a massage chair is an active product performing an action on the user.

Our thoughts on the subject were that a product maybe could be both, but demonstrate the different characteristics during different phases of the panic attack. When in full panic, the product could be active and help the person to *snap out* of the panic attack with a strong sensory input. Furthermore, since many feel cut off from reality in this stage of the panic attack, an active product could be a relief for them because it does not demand that much action from the person. However, when the panic is subsiding the product could be more passive, giving the active role to the person and assist them in processing the panic attack and calming down. Giving the active role to the user in this stage could work as an empowering function, encouraging the user to take initiative and provide the user with a sense of accomplishment and power. This active/passive dynamic is illustrated in figure 14.8.

Reflection

The hypothesis of having active/passive features on a product must be tested since the power dynamic in a panic attack can be a sensitive subject. Moreover, we believe it is important that the product is not overpowering or scary when in its active mode. This could maybe be done with using familiar active actions, such as using movements similar to a breathing animal, or the product being warm. Furthermore, a breathing motion within the product could assist the user in breathing in a calmer way, and the life-like feeling could help the person feeling less alone.

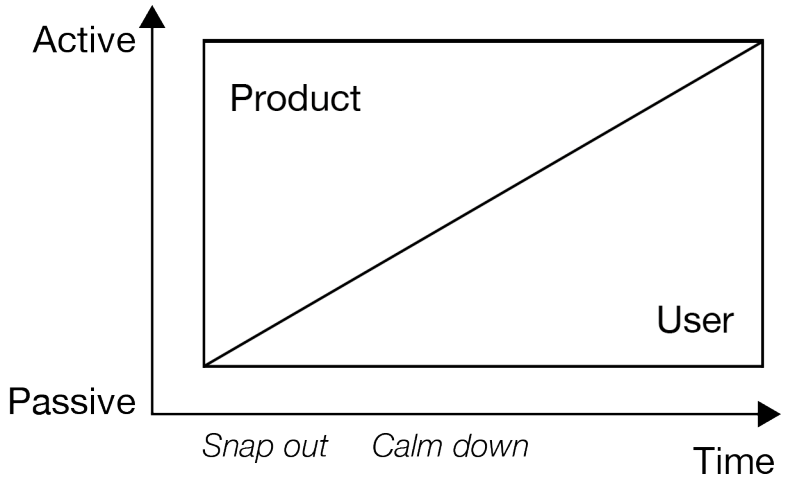


Figure 14.8: An illustration of the transfer of the active/passive role between the person and the product.

CREATING MODELS

In order to later test our theories on where on the body the product should be used and the active/passive dynamic, new models, designed to be hand held, were created. As an inspiration for the further work, the slogan "better than real" was used.

PRODUCTIFICATION THAT IS *BETTER THAN REAL*

The concept of better than real was inspired from Lelo's slogan of the same name. Lelo is a company that makes sex toys that are pleasing for both the eye and the body. Their slogan refers to their profile of making products used for sexual gratification that are not intended to look like a human equivalent of the purpose but is instead designed to be beautiful objects that could just as well lie on the coffee table as in the drawer of the bedside table. The vibrating motion in itself is also inspiring better than real as their is not human sexual activity that provides that specific motion, but a vibrator has the ability to give sexual pleasure that is better than real. There are also other examples on designing items that are better than real. For example there are beautiful prosthetic limbs that are not only trying to be a replacement for the function of a leg, but also provide the user with an artwork attached to the body, without the intention of looking like the real thing. The notion of doing something that is better than real inspired us to search for how we could move away from doing a product that looks too much as an living creature and instead do a product that is not trying to imitate something that it is not. This is relevant in the product development of this product since the concepts that seem promising are, among other things, the hand shaped glove, and the idea of doing something with a movement similar to a breathing animal. An inspiration board with Lelo's products (lelo.com, 2016a and lelo.com, 2016b) and a prosthetic leg (ignition.co, 2016) was created to illustrate the idea, please see figure 14.9.

Figure 14.9: An inspiration board with products that are better than real, (lelo.com, 2016a and lelo.com, 2016b and ignition.co, 2016).

MODELS

When creating the models, the consistency, shape and movement of the prototype were considered. However, the temperature was added to the prototypes in a later stage since this can be altered by heating or chilling the models. The better than real buzz word was used when exploring the properties by using qualities very different to, for example a human hand or a living creature, yet trying to maintain the comforting feeling of these things.

Consistency

We wanted to investigate if designing different consistencies of the product could alter the behaviour and emotions elicited when using the concept. Thus, by designing the interior liquid of the model, the use and behaviour of the person's interaction with the object is designed. When ideating different consistencies, we allowed ourselves to explore slightly odd materials since it is impossible to predict what might work in this context.

Syrup is a slow liquid and handling it in one's hands creates slow movements. It is not possible to rush the slow syrup, and thus we hope it will create a calm behaviour, (in theory) calming the person through autogenic training.

By using "vannperler" (water beads), later called **gel balls**, for floral arrangements made by the company Florex, and water that was absorbed into the beads until the beads reached a size of approximately 1,5 cm in diameter, a consistency similar to fish spawn or caviar was created. When contained in a glove or a condom the water beads moved around creating an almost vibrating sensation. The behaviour we aimed to design with the water beads was interest and curiosity, which served as a counterpart to the calming sensation of the syrup. The gel balls was also crushed to achieve a consistency similar to chewed food, and used in the prototype.

Sugar has in contrast to the syrup and gel balls a dry and slightly creaky consistency. With this we aimed to create a slow moving, yet interesting behaviour of the product.

Similar to sugar, **flour** has a dry texture. However, opposite to sugar, flour has a much smoother consistency, almost resembling a liquid. With this we aimed to create a calming and pleasant behaviour.

To achieve an interesting and slightly unpredictable behaviour in the product, we explored **shear thickening non-Newtonian fluids**, i.e. fluids that increase their viscosity dependent on the shear stress (sciencelearn.org, 2010). To make such a fluid we mixed potato starch with water.

Hair wax has a creamy and slightly firm consistency. The aim of using such a consistency was, similarly to the syrup, to create slow movements resulting in a slow behaviour of the product.

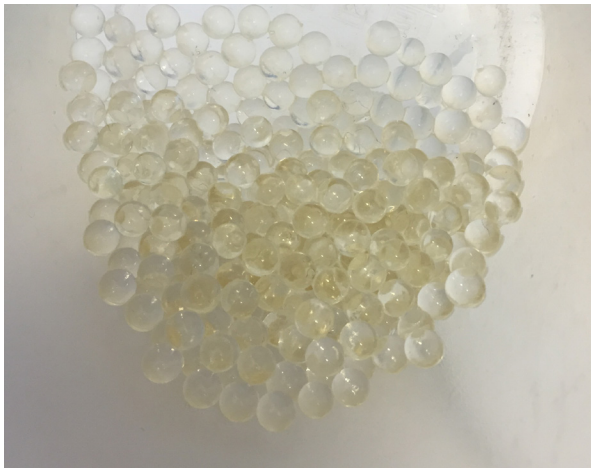


Figure 14.10: The water beads, also called gel balls.

Flour and water was mixed to create **dough** with a creamy texture. This as the syrup and the hair wax resulted in slow movements aimed to create a calming effect on the user.

In order to test a **contrasting consistency** aimed to evoke curiosity and focus on the product, peanuts and water was mixed. This resulted in a watery consistency with hard elements embedded in it.

Shape and surface texture

In addition to the consistency of the product, the shape and surface texture is important for the emotions and behaviours elicited in the user. The different shapes were then filled with the different consistencies to create models. The combination of shapes and consistencies was kept on an exploratory level to promote diversity and thus, not all shapes were filled with all consistencies, and the shapes were filled with different amounts of filling.

The exploratory test revealed that a **hand shaped** object felt very good to hold on one's hand, and thus this shape was explored further. To achieve the shape, vinyl gloves was used since they have the ability to hold many different materials.

The vinyl gloves were filled with syrup, gel balls, sugar, flour, and shear thickening fluid (figure 14.11). The hair wax and the crushed up gel balls was however not used as a filling in the gloves. Furthermore, the shear thickening fluid did not keep its abilities for a very long time. The starch separated from the water, and the water vaporized, leaving the glove hard as cement. Thus, this model could not be used in the evaluation presented later. The dough was used as a filling in a glove but the dough started to ferment, and the model had to be thrown away. Finally, the mix of water and peanuts created a consistency so odd and scary when filled in a glove that this model was disregarded.

The syrup and gel ball hand models generated a lot of curiosity in colleagues and friends, and they were eager to test them. Some thought it felt weird to have the vinyl glove in one's hand, but many enjoyed the sensation. For example, one colleague borrowed the syrup hand for an afternoon to calm herself down when she was stressed, and others liked the gel ball hand so much that several models were made for them to bring home. Thus, an initial indication on that the hands actually can help a person to relax and feel safe and secure was found.

In order to test other shapes and surface textures than the vinyl glove could produce, **cylindrical** objects were also investigated. Both

Figures 14.11: The hand shaped with different fillings. The fillings from left to right are syrup, gel balls, sugar and flour.

balloons and condoms were investigated for this purpose, but the balloons were so stiff that they were almost impossible to fill. The condoms on the other hand offered a very flexible shell to put the filling in, and due to the flexibility, the filling was experienced very differently in the condoms in comparison to the gloves. The condoms also had a more sticky surface texture, providing yet another contrast to the hands.

The condoms were filled with syrup, gel balls, sugar, flour, hair gel and crushed up gel balls (figure 14.12), and as for the hand shape, the shear thickening fluid, the dough and the peanut and water mixture were not used.

The filled condoms were also of interest to our colleagues and friends. However, the condoms were not experienced as being as calming as the hands, but rather fun and interesting. Thus, the condoms seem to have a curiosity evoking effect.

Other shapes constituted of the vinyl gloves and condoms building blocks was also made in order to test whether or not one could use different fillings in different parts of the product. However, the outcome was not very successful and the idea was abandoned in this stage of the development process.

Movement

Different movements were ideated, including vibrations, slower movements and movements generated by the user in order to provide experiences that where both the user and the product were active and passive. The idea behind the vibrations generated by the product was to have an active product that could provide a *snap out* effect for the user, whereas the slower movements provided a calm down effect, and finally the ones where the user generated the movements was to test the experience of an active user and a passive product.

Figure 14.12: The oblong shaped models contained (from left to right) syrup, gel balls, sugar, flour, hair wax and crushed gel balls.

Vibrations

Since vibrations seemed promising in the previous test, we wanted to continue exploring this input. However, the vibrations produced by the Ovo K1 vibrator were very strong and fast, and the vibration pattern was impossible to control in detail. The intense and fast vibrations were experienced as stressful and thus we decided to build our own vibrator with less intense vibrations. This was one by using a DC-motor, an eccentric weight attached to the shaft, an Arduino Uno and an Arduino motor shield. Different vibration patterns were then programmed. One vibration was constant, one resembled a heartbeat (short vibration, short pause, short vibration, long pause), and two intended to assist the person with breathing in an appropriate pace by mimicking a slow breathing pattern (short vibration, long pause, short vibration and long vibration, short pause, long vibration respectively). The vibrations were created with the intention of helping the person to *snap out* of the panic attack and refocus, but at the same time offer a calming and safe sensation, reminiscent of a living creature.

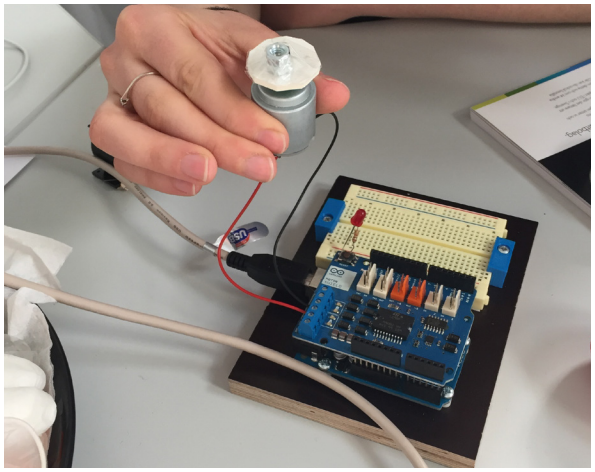


Figure 14.13: The Arduino Uno's breadboard with a DC-motor with an eccentric weight attached that was used to create vibrations.

Since also the vibrations generated by the home made vibrator was experienced as rather intense, we also wanted to investigate **slower movements**. This was done by moving the prototypes in different ways. With the gloves this could be done by pushing up the liquid from the "fingers" to the "palm" of the glove, which resulted in an expanding feeling in the hand of the user. If this motion was done repeatedly (push up the liquid, letting the liquid flow back in the fingers, and then push up the liquid again) a motion resembling the movements of the chest during breathing could be created. To produce movements in the condoms, one could push in two fingers in the condom while the user is holding it, or press on the edge of the condom sticking out from the grip of the user's hand, creating a similar "breathing effect" as in the gloves. This breathing sensation was aimed to create a calming and safe and secure feeling, and a sense of not being alone.

Prototypes using **movements generated by the user** were also made. They used the hand shape as a basis and it was investigated whether a squeeze at one end of the glove could cause movements in another. For example, it was tested if a squeeze in the palm could make the fingers bend backwards and create a feeling of a person holding around their hand. However, these models did not meet our expectations and the idea was left behind.

14.4 REFLECTIONS

The major result in this chapter, i.e. the models, was created in an exploratory manner. The properties of the models were therefore highly dependent on what our imagination had the possibility create, and what materials that was available to us. This could be seen as a downside, but since the aim of the model making was to open our eyes to different materials and shapes and provide a stepping stone for further development, we still saw the models as a success. Thus, the vinyl gloves were filled with syrup, gel balls, sugar, flour, and shear thickening fluid and the condoms were filled with syrup, gel balls, sugar, flour, hair gel and crushed up gel balls was thought to have a potential big enough for bringing them into testing. Also, the vibrations and slow movements showed potential for further testing.

14.5 CONCLUSION

A product used for panic attacks should be handled with the hands since this gives the user as much power over the product as possible. Furthermore, it seems promising to further investigate the activeness of the product in a user journey perspective, i.e. the product being active in the first stage and then takes on a more passive role. Furthermore the models created showed enough potential for further testing.

GUIDELINE

- The product should be hand held.

15. EXPLORATION OF HAPTICS TEST

The models and movements created in the ideation phase needed testing, so a test was designed to test the consistencies, shapes, movements and vibrations. The test procedure was done in an explorative way in order to see if separating the different haptic inputs could be a successful way of finding successful matches and eliminating unsuccessful ones. The tests proved to give insights about the ideation made so far and on the test procedure.

Going into these tests, we wanted to test many different haptic inputs, with thoughts of creating a more advanced product that could afford the user with a range of haptic inputs. The hope was that the different haptic inputs might increase the user's feeling of being safe and secure and that a synergetic effect could be achieved when inputs were combined. The basic idea was that haptic inputs mimicking the feeling of being calm - warm and slow - might increase the person's calmness and thus increase the feeling of being safe and secure. Movements and vibration patterns were created to mimic breathing patterns and slower heartbeats as an idea of having a pattern to "follow" in order to be guided and calm down. Different consistencies were tested in order to evaluate the experience of them, with the idea that a "slower" consistency might increase the experience of being calm. Lastly, the idea was that a warm sensation would increase calmness, thus different temperatures were tested.

15.1 AIM

The aim of this investigation was twofold. The aim was to both to evaluate the early ideas of haptic inputs and to evaluate the test procedure developed.

The early ideas of haptic inputs were evaluated against whether the participant felt safe and secure with the haptic input. The test procedure was developed with the intention of testing haptic inputs individually and to see if there existed synergetic effects of combining them. The aim of the tests was to see if this test procedure was successful enough to embark on tests on a larger scale with individuals with experience of panic attacks.

15.2 METHOD

The test consisted of four categories of haptic inputs being investigated:

- Consistencies
- Movement inside model
- Vibration
- Temperature

The participants were exposed to some variants in the categories and choose which one, if any, of them that made them feel most safe and secure. The purpose was to make the best combination of haptic inputs on three different models and then compare them in order to choose one favourite. After choosing a favourite, the participants were asked questions on it.

The participants were asked to evaluate against it making them feel safe and secure as a lack of feeling safe and secure was reported by many of the interviewees with experience of panic attacks in the investigation phase. The participants in these tests were not individuals with experience of panic attack and it was deemed that asking about an

increase in feeling safe and secure was something also they could relate to, in contrast of asking questions directly related to panic attacks.

The test did not focus on the aforementioned *snap out* effect as it would need something to *snap out* from and validity questions were raised upon creating activities to mimic the focus a panic attack has on the person. As these tests were not carried out with participants with experience of panic attacks, it was deemed more suitable to focus on impressions contributing to feeling safe and secure rather than *snap out* as the participants due to their lack of experience of panic attacks may find it difficult to evaluate this feature.

The participants were blindfolded and wearing hearing protection in order to not be influenced by the way the models looked like and the sounds made (especially from the vibrating feature) when they were used. In addition, shutting out vision and hearing increases the feeling of being exposed which is a feeling many interviewees in the investigation phase talked about.

PARTICIPANTS

The test included three male participants without experience of panic attacks. One of them had a history of depression and anxiety, but not panic attacks. The sample was chosen in order to achieve a first indication before moving on to a more thorough investigation with individuals with experience of panic attacks.

MODELS AND HAPTIC INPUTS TESTED

Different models and haptic inputs were tested, including hand and condom models with different consistencies. The haptic inputs tested were different movements, vibrations and temperatures.

MODELS AND CONSISTENCIES

A variation of consistencies was included and they were enclosed in a glove, a condom or both.

Hand 1: Syrup
Hand 2: Gel balls
Hand 3: Sugar
Hand 4: Flour
Condom 1: Syrup
Condom 2: Gel balls
Condom 3: Sugar
Condom 4: Flour
Condom 5: Hair wax
Condom 6: Crushed gel balls

Movements

The movements were different depending on whether the model was a hand or a condom. The movements included for the hands were:

- Place the fingers of the glove on the backside of the user's hand
- Hold the fingers of the glove together on the back of the user's hand in order to create a pressure between the user's fingers
- Squeeze the fingers of the glove to give pressure inside of the palm (to mimic breaths)

Figure 15.1 and 15.2: The hand models contained (from left to right) syrup, gel balls, sugar and flour. The condom models contained syrup, gel balls, sugar, flour, hair wax and crushed gel balls.

The movements for the condoms were:

- Insert two fingers in the model when placed in the hand of the user and move back and forth (to mimic breaths)
- Insert two fingers in the model when placed in the hand of the user and rotate
- Squeeze on both sides of the model that are outside of the palm of the user (to mimic breaths)

On the models with consistencies that were not liquids and that were filled to a large extent, it was difficult to perform movements inside the models, so creating movements were either done to a smaller extent or excluded.

Vibrations

Four different vibrating patterns were tested. The vibrations were performed on top of the model when held in the user's palm, so that it transmitted to the inside of the model and in the user's palm. The patterns tested were:

- Constant vibration
- Mimicking heartbeat: *zurt, zurt, pause, zurt, zurt*
- Mimicking breathing: *zurt, pause, zurt*
- Slower breathing: *zzzurrr, pause, zzzurrr*

Temperature

Room temperature (which feels differently depending on the consistency, colder for the liquids and warmer for the drier materials), warmer and colder than room temperatures were tested. The models were made warmer and colder by putting them in a bowl with either warm or cold water between the tests.

PROCEDURE

In order to include as many variations and combinations of haptic inputs as possible, a competitive procedure was developed where the participant was confronted with many different haptic inputs. The input that the participant rated highest in each category "won" and a final winning combination was put together and evaluated.

First all ten models were placed in front of the participant and he had a chance to familiarise himself with them and then for each of the models, the participant explained the experience and associations from the model and graded it on a scale 1-10 where 1 is not safe and secure and 10 is that it made him feel very safe and secure. Three models with the highest score proceeded to the next step. Each of the models were exposed to the three types of movements and the participant ranked them, as well as no movement, according to which made him feel most safe and secure. The two other models were exposed to the movements and ranked as well. The next step was to expose the models to and rank the different vibration patterns, with no vibration included, and lastly to rank room temperature, warmer than and colder than room temperature. The winning combination for each of the three models was recreated so that the participant could experience the winning features combined and then rank the three models with the three best of features. When a winner was elected, some questions related to productification of it were asked:

- *"If you used the product in a situation where you feel exposed and stressed/tense/worried, do you think it would help you feel more safe and secure?"*
- *"If you were feeling anxious and worried in a way that made you focus a lot internally on your emotions and thoughts, do you think this sensory input would make you more curious of the surroundings, so that you include more on the external world?"*
- *"Can you see difficulties with having the product in the situation where you are feeling exposed? (E.g. that it is visible, noticeable, being able to carry it with you etc.)"*

The test procedure is shown graphically in figure 15.3.

			Grade*	Comment	*scale 1-10 where 1=not safe/secure, 10=very safe/secure
1	Model: hand	H1: Syrup			
		H2: Gel balls			
		H3: Sugar			
		H4: Flour			
	Model: condom	C1: Syrup			
		C2: Gel balls			
		C3: Sugar			
		C4: Flour			
		C5: Hair wax			
		C6: Crushed gel balls			

			Model 1		Model 2		Model 3	
	Movement		Rank	Comment	Rank	Comment	Rank	Comment
2	Model: hand	Place fingers on back of user's hand						
		Hold fingers together on back of user's hand						
		Squeeze fingers to give pressure inside palm						
		No movement						
	Model: condom	Two fingers in model, move back and forth						
		Two fingers in model, rotate						
		Squeeze both sides of the model that are outside the palm						
		No movement						
3	Vibration	Constant						
		Heartbeat: zurt, zurt, pause, zurt, zurt						
		Breathing: zurt, pause, zurt						
		Slow breathing: zzzurrr, pause, zzzurrr						
		No vibration						
4	Temperature	Cold						
		Room temp						
		Warm						

	Best combo	Rank	Comment
5	Model 1		
	Model 2		
	Model 3		

	Question	Comment
6	If you used the product in a situation where you feel exposed and stressed/tense/worried, so you think it would help you feel more safe and secure?	
	If you were feeling anxious and worried in a way so you focus a lot internally on your emotions and thoughts, do you think this sensory input would make you more curious of the surroundings, so that you include more on the external world?	
	Can you see difficulties with having the product in the situation where you are feeling exposed? (e.g. that it is visible, noticeable, being able to carry it with you etc)	

Figure 15.3: The test procedure.

15.3 RESULT AND ANALYSIS

The test resulted in both outcomes that were intended, as evaluations, and unintentional outcomes, due to the test being explorative. As the participants in this tentative test session were not individuals with panic attack experience, the data from the test is processed in an overall fashion and focus on the information that may be relevant for individuals with panic attacks. The ranking and grading numbers set by the participants in these tests have low validity towards the target group; therefore the numbers are not presented.

HOLISTIC IMPRESSION

The test procedure was created in a way that separate different haptic inputs, but in the test it became obvious that it is difficult to evaluate one single haptic attribute on its own and the participants gave comments based on the overall experience rather than on separate haptic inputs. For example, one hand was filled with flour and this particular hand was filled to a large extent, as that was the best way to create the intended consistency in a model filled with flour. However, what the participants reacted mostly to was that the size was large and that it was "swollen" rather than talking about the consistency. They mentioned that it was too large to hold in their hands rather than whether they liked the consistency on its own. Even when asked more specifically in the consistency, the participants said that they could not evaluate the consistency on its own but that the haptic inputs need to be evaluated in a holistic manner. There was not uniform answers considering whether warm or cold temperature was good, but individual preferences. The participants did not seem to associate a warmer product with a living thing, but rather mentioned preferring warm/cold temperatures based on whether their hands were warm or cold, a person with warm hands wanted a cold product and vice versa.

The conclusion of such findings were to not try to evaluate haptic inputs separately but to take an holistic perspective on the haptic inputs of the models created and create a more complete experience of the impression strived for. As a designer, one has to take the responsibility to create a holistic haptic experience and not only combined haptic inputs.

The test procedure was quite complex as we thought that an advanced product would be needed in order to create an impression that was "strong" enough. To our surprise, the tests indicated that small haptic inputs gave larger impression than expected, thus the product may not need a large variation of haptic inputs that the user can choose from, but rather inputs that are delicately created and well chosen.

VIBRATIONS ARE STRESSFUL

It became evident during the tests that vibrations are difficult to use in a product, as the general impressions were negative. The initial idea was that vibrations could be used as an efficient *snap out* effect, as well as providing a pattern for a calm down effect. Furthermore vibrations could be easily productified. The participants disliked vibrations for several reasons, mainly because it was uncomfortable and stressful.

Firstly, there was a general discomfort of vibrations, the participants just did not like it or attach to it. The vibrations were also interpreted as stressful as it reminded them of cell phones vibrating which was associated with stress. In addition, the vibrations gave rise to anticipatory stress as the participants tried to "follow" a vibration pattern and got stressed from anticipation of the next vibration coming and them feeling as though they were lagging behind. One participant during the test had experience of depression and anxiety and to him the vibrations gave rise to an anxiety reaction as it reminded him of the sensations of anxiety. Comparing this to a panic attack, one symptom is a tingling sensation in hands and arms, which a vibration can be similar to.

UNCOMFORTABLE MOVEMENT: THE IDEA OF MAKING SOMETHING LIVING, DIED

Another feature that was disliked was movement in the product. We intended to create an inflating and deflating movement resembling breathing in the object by the simple means of the test leader putting fingers inside the object and moving. By moving back and forth in a lateral fashion, the size of the object changes similar to a chest rising and falling. The test leader also performed other movements, such as rotating her fingers.

This was experienced as extremely uncomfortable and on the verge of traumatising for several reasons. The participants disliked that the feeling of the test leader inserting her fingers inside of the object they had in their closed hand, as it was associated with sexual penetration. Furthermore, since they had no control of what the test leader was about to do, as they could not see, some mentioned that they felt assaulted (see figure 15.4). In addition, the participants disliked that the object had an uncanny resemblance of a living thing, although it was obvious that it was not alive. They did not like that the model had a life of its own and they did not know what to do with that sensation and notion. This is an indication that the life-like aspect of the object was closing in on the uncanny valley.

THE UNCANNY VALLEY

The uncanny valley is an expression by Masahiro Mori for the types of products that are humanlike but in which the familiarity has a sense of strangeness and unease (MacDorman, 2006). Mori hypothesised that the familiarity increases with the human likeness until a point is reached where it is experienced as strange and uncanny instead, this is caused by a sensitivity to perceived imperfections in forms that are near humanlike. The uncanny valley is magnified by movement, according to Mori (MacDorman, 2006, referencing to Mori, 1970). An image illustrating the uncanny valley can be seen in figure 15.5.

Figure 15.4: A participant was uncomfortable by the movement generated by the test leader.

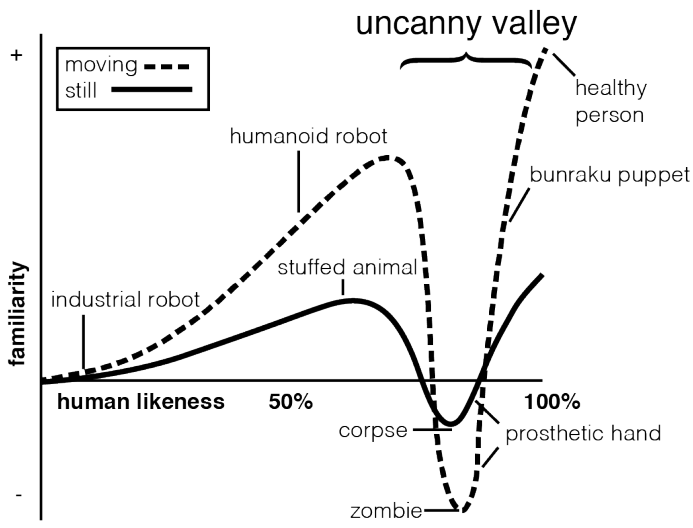


Figure 15.5: The uncanny valley according to Mori (MacDorman, 2006, referencing to Mori, 1970).

15.4 REFLECTIONS

The results of the tests indicated that we needed to rethink both the haptic inputs and the test procedure with regards to how a person with panic attacks might experience them. The following section includes reflections on how individuals with panic attack might experience inputs such as those presented in this chapter, as well as what might be missing from the ideas and concepts at the moment.

IMPLICATIONS FOR INDIVIDUALS WITH PANIC ATTACKS

The test included individuals without experience of panic attacks, but them disliking the unexpectedness of the vibration patterns was a signal that it would not be successful for individuals with panic attacks. Using a pattern to follow is difficult to design as the pattern has to be exactly right for the person at the specific time. If the person is stressed, the pattern has to be fast enough to "meet" the person in their stress, but at the same time slow enough to set a pattern to guide them in order to calm down. Subtle differences can be perceived as stressful as it either is too fast to calm down or too slow to be able to catch up. In addition, having a product that without preparation gives a vibration can be a surprising feature that can either give an appropriate *snap out* effect or may shock the person. As the panic attack in itself can come quickly and unexpectedly, having a product that has a similar effect may cause more anxiety and stress. Instead of giving a *snap out* effect so the person can *snap out* form the panic attack, the unexpectedness can fuel the feeling of being out of control and the panic taking over. Thus, the conclusion is that vibrations should not be used. A guideline from individuals with panic attacks is also to design for expectedness and fine tune elements of surprise, if any are used.

Similarly as with vibration, the unexpectedness of movements can be amplified as a bad experience for individuals with panic attacks. The timeline illustration was presented in the investigation phase as an illustration showing that individuals with anxiety view the future with worry as a contrast to viewing the future with excitement (figure 15.6). An analogue can be made for unexpected movements as the person may experience them as even more uncomfortable compared to a person not prone to anxiety.

ACTIVE PERSON, PASSIVE PRODUCT

As both vibrations and movements were found uncomfortable since they had an uncomfortable element of unexpectedness, a *snap out* effect with these inputs should be avoided. Thus, *snap out* must be redefined from having an active product that provides such an

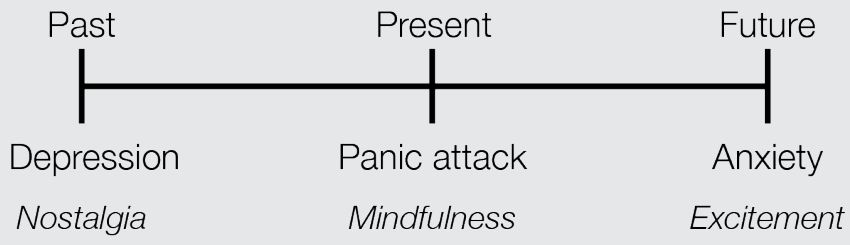


Figure 15.6: A timeline illustration with the placement of anxious and depressive thoughts as well as how mindfulness is practiced.

input to something else subtler, being to refocus. By interpreting *snap out* as something to provide refocus rather than a strong sensory input that may shock the person, a new range of inputs can be considered where the user can be active and the product may be passive. This would give power to the user, which is important in a product against panic attacks where the person may feel out of power.

SAFE AND SECURE IS NOT ENOUGH

One final insight from this stage was when asking to evaluate the haptic inputs against feeling safe and secure was that it might not be enough. The designer's gut feeling told us that an increase of being safe and secure is important, but that there may be other needs, in addition to being more safe and secure. The implication of this was that an iteration of the ideation is needed.

15.4 CONCLUSION

Concluding the exploration of haptics tests are guidelines that summarise the insights the test generated. The guidelines concern the following development work for concepts, guidelines on how to design for persons with panic attacks and lastly, guidelines on how to design a future evaluative test.

GUIDELINES FOR THE NEXT ITERATION

Concluding the tests, the following guidelines for the next iteration of the concept development were created.

- **A holistic impression.** It became obvious in these tests that it is difficult to separate haptic inputs and to evaluate them separately. This leaves the responsibility to the designer to take a holistic perspective on the haptic inputs of the models created and create a more complete model that gives the overall impression that is strived for. For this project, this means that the hand shaped models give the feeling of safety and security that is strived for, the syrup consistency has the slow, calming feature and the gel balls gave rise to much interest.

- **No vibration!** Vibrations were deemed as a *snap out* feature with a good opportunity for productification, but the tests provided many reasons against including vibrations in a product. Even though the participants did not have prior experience of panic attacks, some of the negative impressions are general and speak against using vibrations for participants with panic attack experience.

- **No movements!** The participants found the movement uncomfortable due to the fact that the object gets closer to the uncanny valley, as well as the movement being unexpected. For a person with panic attacks, this may very well fuel the unexpectedness of an attack and the feeling of things being unreal.

- **Clarify and simplify.** Going into the concept development phase we strived for creating an advanced product, which included many different haptic inputs as we thought it would be necessary in order to give impressions that were "strong" enough,

but the tests showed that small inputs give large impressions. Too complex and advanced products were not more liked than those, which gave more subtle inputs. In the following ideation, having simpler concepts where the design intention comes across more clearly is preferable. For example, the syrup hand exemplifies slowness, which may be enough.

- **Active person, not product.** Empower the user by redefining *snap out* to refocus, making the person active in the relationship with the product.

- **Safe and secure is not enough!** The tests were focusing on something that made the person feel safe and secure, and although this is an important aspect, other needs may exist.

GUIDELINES FOR DESIGNING FOR INDIVIDUALS WITH PANIC ATTACKS: DESIGN FOR EMPOWERMENT

The above mentioned factors means that more concepts need to be explored, offering other ways of helping persons with panic attacks. In *Chapter 12: The desired effect of a future product*, one of the general needs that a future product should fulfil concerned empowerment:

- *The product should empower the user in order for them to feel that they regain control in the panic attack.*

The importance of designing for empowerment was realised earlier in the project, but the tests in this section provided some answers on how to, and how not to, do that. Individuals with anxiety interpret unexpected things differently than people who are not prone to anxiety, as they may view the future with apprehension and worry rather than excitement. This means that in order to design for empowerment, the inputs should not be unexpected and the user should have the active part in using the product. The guidelines underneath are based on creating a product that empowers the user.

TABLE 15.1: EMPOWERING DESIGN GUIDELINES.

Guideline	Explanation
Reliable feedback	Action leads to the same reaction
Process	Possibility to work/fiddle/process in hand/s
Personalise	Personalisation can make the user more comfortable, safe and secure with the product
Hideable	Possibility to hide in hand/s
Expected	Everything has to be expected for a person with panic attacks in order to not fuel the feeling of depersonalisation/derealisation
Congruency	Congruency between features and media/material
Fine-tuned snap out	A snap out effect should have the purpose of refocusing the user's attention, but may not increase the feeling of being out of control
Likeability	The user should like the product enough to use it outside of panic situations to make it a normal reference to the non-panic world
Reaction, not action	Actions should not just happen upon the user, but actions performed by the product should come as a feedback reaction to what the users do
Feedback, not programme	The user is in control of how the product changes
Help yourself	Give the user the tools to make them more independent of others

GUIDELINES FOR TEST PROCEDURE

The concepts need to be more focused and the test procedure needs to be simplified in accordance with the future concepts' sharper focus. A future evaluative test needs to have a different procedure with focus on:

- Evaluation of a holistic haptic impression
- Evaluation focusing on other factors than safe and secure

16. FILLING THE VOID

Exploring tests for haptics evaluations showed that a different approach is needed, with a focus on a holistic perspective of the concepts and models. The tests also gave the insight that there may be other needs that a product could fulfil in addition to making the person more safe and secure. Due to this, an iteration of making concepts that could fill the void from the focus on only safe and secure began.

16.1 AIM

With the vibration input eliminated, another haptic input taking over the role of providing a *snap out* effect was needed. Furthermore, safety and security does not fully encompass the full extent of emotions required to help a person during a panic attack. Thus, before finally evaluating the concepts, the thoughts and ideas received during the explorative haptic experience test needed to be incorporated in the concepts, and a wider view of what the product should do had to be achieved. The aim of this activity is therefore to revise the concepts, making them prepared for tests with people suffering from panic attacks.

16.2 METHOD

In order to generate new concepts, the guidelines developed on the basis of the exploration of haptics test were used. With these taken into consideration, new ideas were discussed and fast sketches and prototypes served as a way of developing the thoughts and putting them to the test.

PARTICIPANT

The prototypes were tested by a participant (without experience of panic attacks) who was able to explore the models haptically with her hands. The participant tested the concepts that were developed in addition to the hand concept, so opinions and impressions from the participant is included in the new concepts and not the hand concept in the result section of this chapter. Similar to previous tests, the participant was blindfolded and had hearing protection on in order for the person to focus on the haptic impression, and the participant evaluated the concepts on the basis of how safe and secure the concept made the participant feel.

In addition to the participant, expert 1, behaviourist at ÅSS, was also presented with the concepts and gave her thoughts on them.

16.3 RESULT AND ANALYSIS

In order to move forwards, we had to look back and revisit the core issues of a panic attack. The main problem stated as the internal focus on thoughts and bodily reactions is one, and another was a lack of feeling safe and secure. Furthermore, feelings of shame for oneself and one's panic attacks are problems that many people suffering from panic attacks have. All of these emotions and feelings are somewhat intertwined. The focus on thoughts and bodily reactions can lead to misinterpretation of danger and a sense of feeling unsafe and insecure, and the focus on thoughts can spiral into catastrophic thought of what others might think of you, causing shame. The hand concept proved to be relatively successful in creating a feeling of being safe and secure, since it provides the user with something to hold onto, and the familiar touch of a hand. Thus, the hand concept only needs smaller adjustments to continue on to the next phase. The issues of internal focusing and shame are however not attended to as extensively as providing the user with a sense of being safe and

secure, and therefore, concepts for tackling these issues must be developed.

Furthermore, a major conclusion that could be drawn in the previous chapter was that it can be very uncomfortable having things happen upon you. Therefore, the further development of the concepts focus on making products that are reactive to the actions of the user, rather than making product that gives the user an unexpected or abrupt input. Thus, elements of hot and cold or inherent movements were not considered in this development phase. Instead we focused on making calm products that a user could find trustworthy and responsive to their inputs. Thus, the product should rather amplify the impressions that are already there, by for example conducting heat produced by the user's body, than producing new stimuli.

PERFECTING THE SAFE AND SECURE HAND

The gloves filled with syrup and gel balls were, in our opinion, successful in its simplicity. However, the surface texture of the vinyl glove was indeed not perfect. The vinyl texture can bring up associations of medical equipment, and its heat transferring abilities made the hand feel very cold to the touch even though it was room temperature, in addition the plastic cover does not absorb perspirations from the hands, making it uncomfortable to hold after a while. To address this issue, a tricot fabric cover to fit on the vinyl hands was made. This made the hands smooth and warmer to the touch, thus hopefully making them contribute even more to the feeling of being safe and secure. The concepts are shown in figure 16.1.

In addition to the fabric cover for the plastic glove, we also developed other models based on the hand, but with a less apparent hand appearance. This included exploring a hand with shorter fingers making it less hand like, as well as models with a knuckleduster appearance, which replaced the fingers of the model with holes for the user's fingers. However, when interacting with the models, we discovered that the comforting feeling of having the fingers of the model between one's fingers was lost when the fingers of the models were shortened. The reason for the loss of pleasantness was probably that the shorter fingers had a smaller weight and thus the pressure between the fingers of the user was lowered. The knuckleduster model was also not a success. Putting one's fingers into the holes of the model resulted in a constricting feeling and the comfort and security was lost. Please see figure 16.2 for other hand models.

INTENDED USE

The hand concept should be held in a similar way to a real human hand. Thus, the fingers of the product should be located between the user's fingers, giving the familiar and comforting feeling of holding hands.

Figure 16.1: The hand concept with fabric cover.

Figure 16.2: The other hand models.

REFLECTIONS

A glove filled with syrup or gel balls might seem as a very simple product for such a complex problem. However, there seems to be a power in holding something resembling a hand, giving the user comfort and safety and security. Furthermore, we believe that having something resembling human interaction with you in the panic attack can help persons that find it difficult interacting with others during the attack become accustomed to physical touch and closeness. Thus, the hand might help them letting other people come close and comfort them during a panic attack. As the hand is filled with the slow moving syrup, it is better than real compared to a real human hand, since it is impossible to stress slow moving syrup. This makes the model step away from the uncanny valley, since it does not try to resemble a human hand, but has other properties that may even be better than a real hand. Furthermore, the hand might also help persons that have issues with having safety persons. The hand could be used as a way of becoming less dependent on the presence of a safety person since it could give comfort in the troublesome situation, yet letting the user be empowered in them handling the panic attack on their own.

The hand concept fulfils many of the requirements set in the previous chapter with its calm and predictable attributes. The congruency between the features is improved with the smooth tricot surface, and hopefully the likeability of the product is also increased with the new soft surface. Furthermore, the hand has the potential to be personalised by the user. One can imagine that the product could be ordered with different surface structures and fillings depending on the preferences of the user. Furthermore, the user could load the hand with the characteristics of a person that they feel safe and secure with. For example, the user could think of the hand as an extension of a friend and hold on to the hand when the friend is not near by. The biggest problem with this concept is the fact that it is hard to hide. The fingers of the hand extend beyond the user's hand and the product is too big to hide in one hand even though the fingers are folded in. Thus, the concept might be more suitable for persons that can deal with other people seeing them interacting with a product.

As with all things done in this project, the risk of safety behaviours must be taken into consideration. The hand will probably not help the user extinguishing a panic attack, and due to its subtle nature it will probably give the user room for reflection. Thus, we do not believe that this product will become addictive to the user, making them dependent on the product. Instead we hope that the product could make the panic attacks less scary and in the long term perspective help the users become less scared of the panic attacks, breaking the vicious cycle of fear leading to panic attacks. Nevertheless, there is a risk that some users will create a safety behaviour around the product, similar to a safety behaviour created around a person. However, we believe that the hand also can serve as a way of becoming more independent of safety persons via the hand, making the hand a middle step between being totally dependent on safety persons and being completely independent of safety persons.

MORE THAN SAFE AND SECURE

Other concepts outside of increasing the user's feeling of being safe and secure were investigated, including curiosity and empathy as ways of making a product that could help against panic attacks. The sections on these concepts include comments, impressions and opinions of a person testing them.

CURIOSITY

As previously mentioned, the vibration and movement inputs were eliminated in the previous round of tests, and thus, something else with a similar *snap out* effect had to fill its place. With the vibration and movements gone, we had to think about other haptic inputs strong enough to make a person focus on them, and the idea of focusing more on curiosity started to grow. Curiosity can be seen as the positive equivalent of anxiousness, since it is a future-oriented feeling emerging from dealing with something that is unknown. Curiosity is a feeling that one has power over, compared to anxiousness that takes over; so designing for curiosity is designing for empowerment. What if a product distracts one from feeling anxious and having catastrophic thoughts and turns it into a feeling of curiosity?

When ideating solutions to achieve this effect, thoughts about creating a complex surface textures started to form. The idea was that a complex, irregular and rough surface could offer the user something to explore and focus on, yet being an interaction simple enough for a user to perform during a panic attack, and calm enough not to stress the user further.

The idea of giving the user a complex surface to explore haptically also resonate with the ideas of mindfulness, i.e. exploring the world around oneself with one's senses and focus on that impression. Thus, a product doing this can be seen as productification of mindfulness, and a first step of starting to work with the method. The advantage with doing such a productification is that a product can be easier to grasp than a philosophy or way of thinking and behaving. Furthermore, practising mindfulness on your own can be hard, especially in a stressful situation like a panic attack, since it requires the user to be fully focused on everyday things that one would otherwise ignore (e.g. how the wind feel on one's face, or how the birds sound). Thus, if a product could help one focus on something in the outside world, mindfulness could be made easier, and a *snap out* effect could be achieved through refocusing.

One problem still remained, how should a complex, irregular and rough surface be presented to the user without him or her experiencing it as unpleasant and hostile? The

Figure 16.3: Stones.

solution to us were stones. They have nooks and crannies that create a complex and rough surface structure that are exciting to explore. At the same time, the stone is inherently calm and safe, and even though the surface is rough, it is still pleasant to touch. Furthermore, stones are heavy and in the previous tests this was seen as a positive attribute, contributing to the sense of comfort and safety.

A selection of stones was picked in order for another person to evaluate what she thought about the haptic experience received from the stones. The stones were selected from the mineral collection of Martin Thor, a geology student at Gothenburg University, and contained a wide variety of shapes, sizes and mineral compositions (see figure 16.3).

The response from the participant was positive, and when she rated how safe and secure she felt while interacting with the stones she gave them ratings between 5 and 9. She stated that

"I could hang on to this, it is almost like I am holding onto a life-buoy"

Furthermore she appreciated the interesting texture on the stones. With this evaluation, and our own belief in the power of a distracting and curiosity evoking complex surfaces, the stone concept was decided to be taken into the next round of testing. However, not all stones could fit in the test, and thus, the two of the stones with the highest score from the participant was used. These were *"the shard"* and *"the cornerstone"*. In addition, *"the fossil"* (please see figure 16.4) was brought to further testing in order to achieve a wider set of properties in the stones. With these three stones, a collection of small, big smooth and rugged surfaces was presented.

Intended use

The stone is simply held in the user's hands, giving the user the possibility to explore the surface of the stone and focus on this sensation.

Figure 16.4: The chosen stones, from left to right are the cornerstone, the shard and the fossil.

Reflections

A stone is a natural item that one can find on the ground all around the world. Having a stone as a concept in a product development project is therefore rather odd. The stones were not processed in any way by a human hand and thus, the properties of it does not have any design intentions. The amazing thing is however that the participant connected with the stones and attributed them with values. Maybe the fact that the stones were not designed made the product more authentic and down to earth, evoking feelings and emotions in the participant. Furthermore, the hard and solid properties of the stone might be preferable during a panic attack since this mimics some of the feeling in the user. If the user feel tense and closed off, it might be hard to connect with something that is very soft and inviting since this is so far away from the emotional state that they are in. The hard, yet calm stone might therefore be a good object for meeting the person's feeling in a panic attack without adding to the stress.

As for the hand, the stone concept is a very reliable and congruent concept, which resonates with the guidelines. Furthermore, the stone is hideable in the user's hand, making it discrete. Moreover, the stone is just a stone, which reduces the risk of a person seeing the product and think "that is a product for panic attacks, the user must have a panic attack right now". The stones also proved to be likeable which is a very desirable feature.

In a safety behaviour perspective, we believe that the stone is a fairly safe product. The objective of the stone is partly to help the user learn how to use mindfulness techniques, and thus, the ultimate long-term goal is that the user does not need the stone to practise mindfulness, making the product redundant.

EMPATHY THROUGH EXTERNALISATION

When ideating a product aimed towards tackling the issue of shame, our thoughts went back to Brené Brown. According to her, shame is a fear of disconnection and she states that the antidote to disconnection is empathy. Furthermore Brown stresses the importance to be kind and compassionate to oneself in order for us to be able to practise compassion with others.

Brown's ideas on shame, connection, empathy and compassion for oneself lead us to think about a product assisting the user in feeling empathy for themselves, being in power of one's inner dialogue empowers the person to not fall victim to negative thoughts. However, this was a hard nut to crack since the harsh inner dialogue of, for example, the persona Ashamed Ashley is a deeply rooted way of thinking and acting, that is not easily changed. Our way of dealing with the issue with a productification point of view was to make a product that encourages the user to first feel empathy for the product and then externalise themselves into the product, hopefully resulting in empathy for oneself.

The first mission was thus to create a product that evoked empathy in the user. To do this we began thinking about cute and vulnerable baby animals and we decided that the product should be small and soft, with round shapes. The next mission was to make the user connect with this cute and vulnerable creature is a way that enabled the user to externalise themselves in the product. This was done by having the product mirror the user in the panic attack, creating recognition. Thus, the product should look and feel closed off and tense when the user is so. Finally we believed that the user had to be encouraged to take actions against the shame, helping him or her think and act empathic towards themselves. Again we wanted to use the product as a mirror for the user's state of mind, and the idea of making the product respond to comfort arose. The final idea was therefore to have a product that first looked closed off and tense, and that after the user had comforted it, and

comforted him or herself, with caressing and kind words, opened up to reveal its soft and vulnerable side, encouraging the user to dare to be vulnerable. A sketch of the idea is shown in figure 16.5.

As for the stones, this concept went through a small test with one participant. Thus, models had to be made. In this stage, the idea of creating something cute and soft was tested without the component of transformation from tense to relaxed, in order to simplify the test. The models were made out of tricot fabric filled with sugar, and the shape of the models were inspired by the sketch shown in figure xx and the previously successful hand (see figures 16.6 and 16.7).

The participant liked the haptic impression created by the models. Furthermore, she stated that she wanted to take care of the models, suggesting that our intention of creating a product evoking sympathy had worked. However, in order to make the concept ready for the final evaluation, the aspects of making something that changes from tense and closed off into something soft an open had to be added.

The concept of a bird like creature was further developed by adding foam board to the back and "wings" of the animal, making it possible to achieve a hard shell around the creature when it is curled together. More wings were also added to the bird, and three seemed to be the magic number, enabling the bird to cover its entire stomach with its wings. To make the wings flexible, the foam board was given slits on one side, and to make the wings stay in the desired positions wire was embedded in the foam board. Furthermore, the wings were covered in fabric to achieve a soft surface texture. This concept is later referred to as the little birdie.

Two other ways of showing the idea of empathy for oneself through externalisation were also developed. One is called the

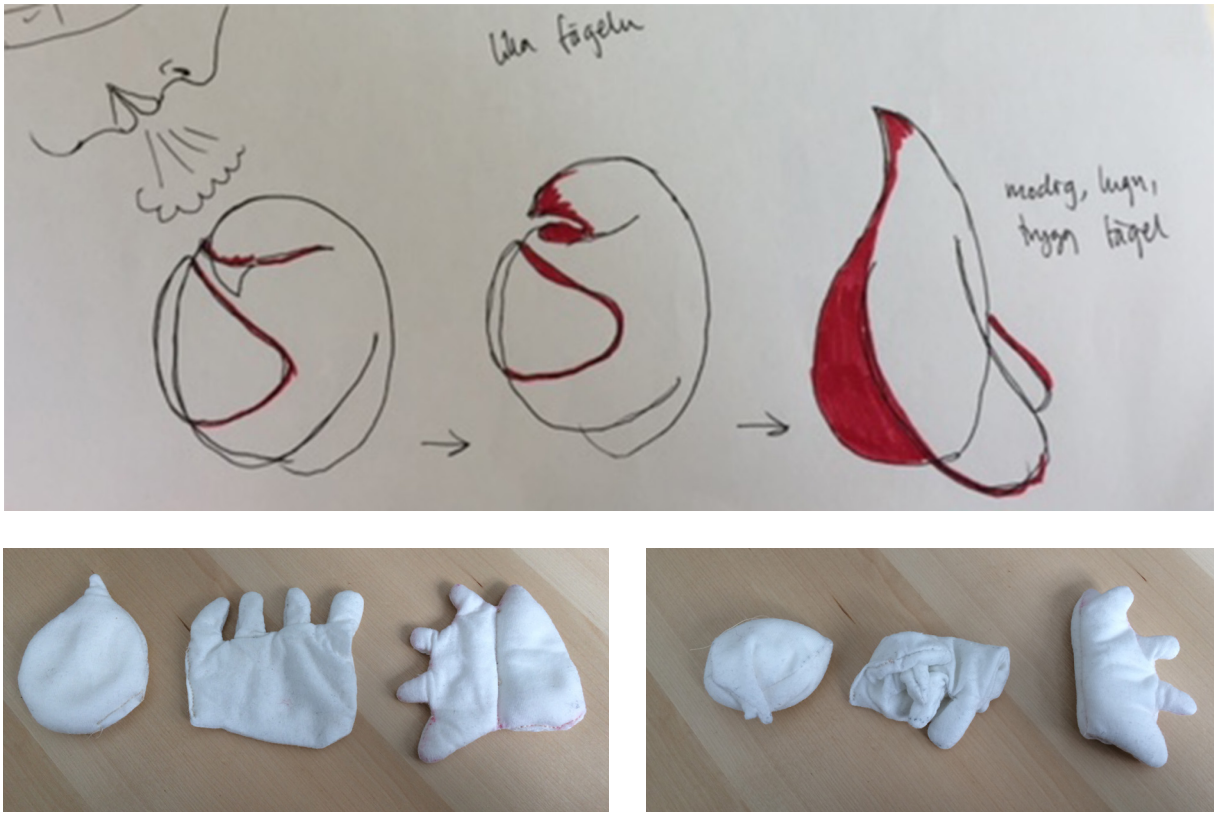


Figure 16.5: Sketch of externalisation through a little birdie.
Figure 16.6 and 16.7: The first models of the empathy from externalisation concept in their open and closed states.

armadillo and consists of paper lamellas, bent and joined together to create a ball that can be opened by pushing the lamellas aside. Inside the ball, a vinyl glove filled with water was attached. This in order to achieve the same contrast between hard and soft found in the little birdie, but adding the benefit of having the hand concept within. The other concept is called the gravel hand and consists of a vinyl glove filled with syrup that is covered by a finely knitted glove. On one side of the knitted glove, gravel was attached with glue to provide the model with a rough surface similar to the stones. Wire was also attached to the glove, enabling it to stay closed, showing only the gravel side. The models is shown in figures 16.8, 16.9, 16.10 and 16.11.

Intended use

The use of the empathy concepts is a bit more complex. The idea is that the user holds the product in their hands, with the product mirroring their state of mind. Thus, if the user is in the symptom scare, or panic attack phase and feel tense and scared, the product should be in its closed state with the hard shell covering the soft parts of the product. At this point, the user can hold on to the product, exploring the surface and try to focus on it, at the same time as he or she tries to express empathy for the animal, and in extension empathy for themselves. This is done by striking the surface and thinking kind thoughts. For example, the user might think:

"I understand that you are scared, and it is okay, but you don't have to be tense, there is no real danger here. You can be safe and show who you are, you don't have to hide"

Figures 16.8, 16.9, 16.10 and 16.11: The little birdie, the armadillo and the gravel hand in the closed to opened states.

When the user changes their state of mind, the user should update the state of the product. Meaning, when the user feel less scared and tense he or she can start to open up the product, revealing a part of the soft inside. The user should then continue with showing empathy for the product and for themselves, until they feel calm and accepting of themselves and the product has opened up completely.

Reflections

The concept of enabling the user to feel more empathy for themselves is rather abstract. Thus, it might be harder for the user to understand how they should use the product without instructions. These concepts might therefore be more suitable to be used in collaboration with a therapist. Even if the idea is abstract, it might help patients and therapist concretises the ideas of self acceptance described in ACT therapy, and assist the users with embracing this emotion. One possible downside of this concept track is that it to some extent encourage the user to turn their attention to the inner climate. However, since the inner work done by the user is directed towards a product in the outside world we believe that the product also can help the user include the world around him or her.

As for the guidelines stated in the previous chapter, *Chapter 15: Exploration of haptics test*, this concept focuses more on the process and likeability aspects of the guidelines. The empathy concepts offer the user a process to relate to during the panic attack, and are designed to make the user like and connect with the product. To fulfil the guideline of feedback not action, the product is designed in a way that enables the user to control the openness of the product themselves in a pace that they feel comfortable with. If the product opened itself dependent on, for example, the amount of time the user has interacted with the product, the product could get out of sync with the user. If the product opened up faster than the user, the user could become stressed and disappointed since the product is signalling that they should feel good at this point in time.

Since this concept is very much focused on creating a kinder inner climate in the user, we believe that the risk of creating a safety behaviour is low. Instead we hope that the concept would help the user accept themselves and become more safe and secure from within. Furthermore, as for the stone concept, the goal is to teach the user a new way of thinking and acting, making the product redundant when the user has mastered the new approach.

EXPERT 1'S THOUGHTS OF THE CONCEPTS

Expert 1, behaviourist at ÅSS, is very fond of the idea of making a product that helps the user include the world around them, in order to break the internal focus and instead be in the moment. She also likes the idea of having a hand held product, and agrees with our view of an active product on the body having the risk of causing anxiety.

Expert 1 sees benefits in all concept categories, but she is especially excited about the hand and the empathy concepts. She likes that the hand is heavy and that it stimulates the sensitive area between the fingers, resulting in a relaxing sensation. Expert 1 also says that when she closes her eyes while holding the hand, it almost feel like she is holding hands with her husband. She likes the idea of the empathy product being a process, and she states that what one needs in the long run is empathy. However, she believes that it can take time to achieve the wanted result. Furthermore, expert 1 states that the empathy concept is something entirely new, that gives the user a benefit on a deeper level, while the hand is more similar to a stress ball.

Expert 1 also says that we should not focus too much on the risk of safety behaviours. She states that a product making the panic attack easier to handle is very valuable, even if the prize is causing a safety behaviour. Furthermore, she stresses that a product might not be suitable for all persons, but that a product can be of much help for the persons that the product suits.

16.4 REFLECTIONS

The effect of the product was previously defined as breaking the internal focus on thoughts and bodily reactions by including the world around the user through a sensory input. With these concepts one have to ask the question: does the concepts aim to fulfil the desired effect? The stone concepts are very focused on including the world around the user with the distinct and attention drawing haptic input. The hand and the empathy concepts on the other hand, are not as obviously fulfilling the effect. These concepts have other side benefits, such as providing the user with comfort and helping the user be more empathic towards themselves, which draws a lot of focus. However, we believe that the inputs created by the hand and empathy concepts are able to help the user to also refocus their attention to the sensory input they are experiencing and the world that is present around them.

16.5 CONCLUSION

There seem to be many ways to walk down in order to help persons suffering from panic attacks by using a haptic impression. It also seems that the products does not have to be that complex to have an effect on the problem, even though the problem itself is very complex. On the contrary, it seems to be beneficial to have a simple product in order for the user not to be further stressed in the panic attack.

17. HAPTIC EVALUATION TESTS

The models developed in the previous chapter must be put to the test in order to confirm or reject our hypotheses. This was done by letting persons with experience from panic attacks explore the models and share their opinions on them.

17.1 AIM

The aim of the haptic evaluation tests was to evaluate the models of the three concepts and the ideas of the concepts with participants with experience of panic attacks as well as explore the impressions the participants get from them.

17.2 METHOD

In this section, the overall method, the participants of the test, the models used and the test procedure is described.

OVERALL METHOD

The haptic evaluation tests were conducted with eight participants, who all have experience of panic attacks in order to evaluate the concepts from a panic attack perspective. As it would be problematic to perform tests in a real panic situation, an evaluative test was instead conducted where the participants that experienced the different haptic input were asked to think aloud and explain their thoughts, feelings and associations when interacting with the concepts.

The participants were asked to keep their eyes closed while experiencing the haptic impression for several reasons; firstly, the models were not executed in a perfect way, but were made in order to get the idea of the concept across. Thus seeing the model might influence the participant negatively. In addition, the models were executed to different points of perfection, so there was a clear visual imbalance between the models. Secondly, the participants were to exclude their visual sense in order to focus on the haptic impressions and not draw conclusions about the object based on its looks. A third reason to exclude vision was that one symptom of a panic attack is blurred vision and so in a real life situation, the person might not be able to rely on their visual sense.

The general procedure was that the person was confronted with two or three models of each concept and got a chance to experience them and give spontaneous reactions. The participant was then to choose one of the models that he or she liked the most, say where in the panic attack the sensation might help and then fill out a semantic scale on the impression. The semantic scales were created in order to include different impressions of the effect the concepts aimed to create. When they had experienced all concepts, they got to grade the models on whether they think they could help in a panic attack, and lastly, a general discussion followed where the intentions and underlying ideas were presented to the participant to hear their thoughts and reactions on them.

PARTICIPANTS

The evaluation tests were conducted with eight individual: three males and five females, ages ranging between 23 and 40. The participants came from contacts made earlier in the project, during the investigation phase and throughout the project. All participants have experienced panic attacks with a varying de-

gree of severity and frequency in order to get feedback from different types of sufferers.

MODELS

During the test, the participants were confronted with an array of different models of the three concepts *distraction*, *comfort* and *externalisation*. The intention was to both evaluate the three different concepts and to evaluate different representations of the concepts with different models of each. The models used to represent the distraction concept were three different stones called *the fossil, the shard* and *the cornerstone.* The models used to represent the comfort concept were called *the syrup hand* and the gel ball hand. Finally, the models used to represent the externalization concept were called *the little birdie, the armadillo* and the gravel hand.

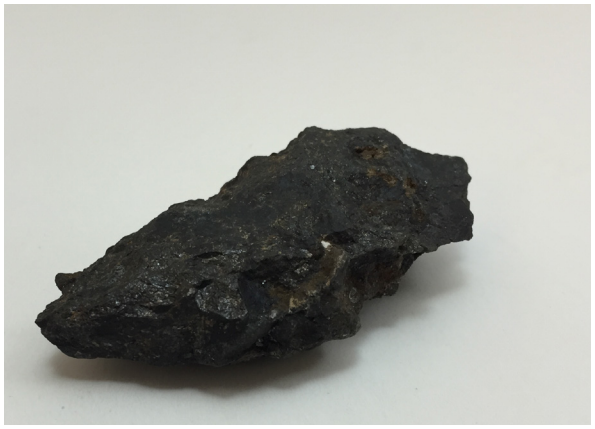
DISTRACTING STONES

According to the geology student Martin Thor at Gothenburg University, the fossil is a fossilised orthocerida, which is an extinct octopus. It is a stone with an unusual cylindrical shape with a rough surface on the cylindrical sides and a smooth top surface. This stone was chosen as it lies well in a closed grip of the hand where the thumb of the hand reaches the smooth surface. There is an edge between the smooth surface and the cylindrical sides that is sharp but not to the extent where the users can hurt themselves. The fossil is shown in figure 17.1 and 17.2. The grid in figure 17.2 shows the size of the stone, with the numbers indicating centimetres.

Figures 17.1 and 17.2: The fossil.

Thor states that the shard is a magnetite bearing skarn stone of a flatter character with a profile that is similar to a shard or a spearhead. The shape profile shape is prismatic and it was chosen because it lies well in the palm of the hand. Furthermore, the surface has a rougher structure. The shard is shown in figures 17.3 and 17.4.

The cornerstone is a skarn stone according to Thor, with a larger, bulkier volume than the previous two stones and was chosen since it fills the hands of the user. The surface is not as rough as the shard's and the sides are more flat than the fossil's, but it has interesting corners and edges where the flatter sides meet. In addition, the corner stone has a small bump on one of the surfaces. The cornerstone is shown in figures 17.5 and 17.6.



Figures 17.3 and 17.4: The shard.

Figures 17.5 and 17.6: The cornerstone.

COMFORTING HANDS

The hands that were chosen to for evaluation was the syrup hand the gel balls hand. The syrup hand is a plastic glove filled with syrup (figures 17.7 and 17.8). The gel ball model was a plastic glove containing small balls with a gel like structure and a small amount of water (figures 17.9 and 17.10). The balls in the glove can move around, creating an interesting haptic impression. Both gloves have a fabric cover.

Figures 17.7 and 17.8: The syrup hand.

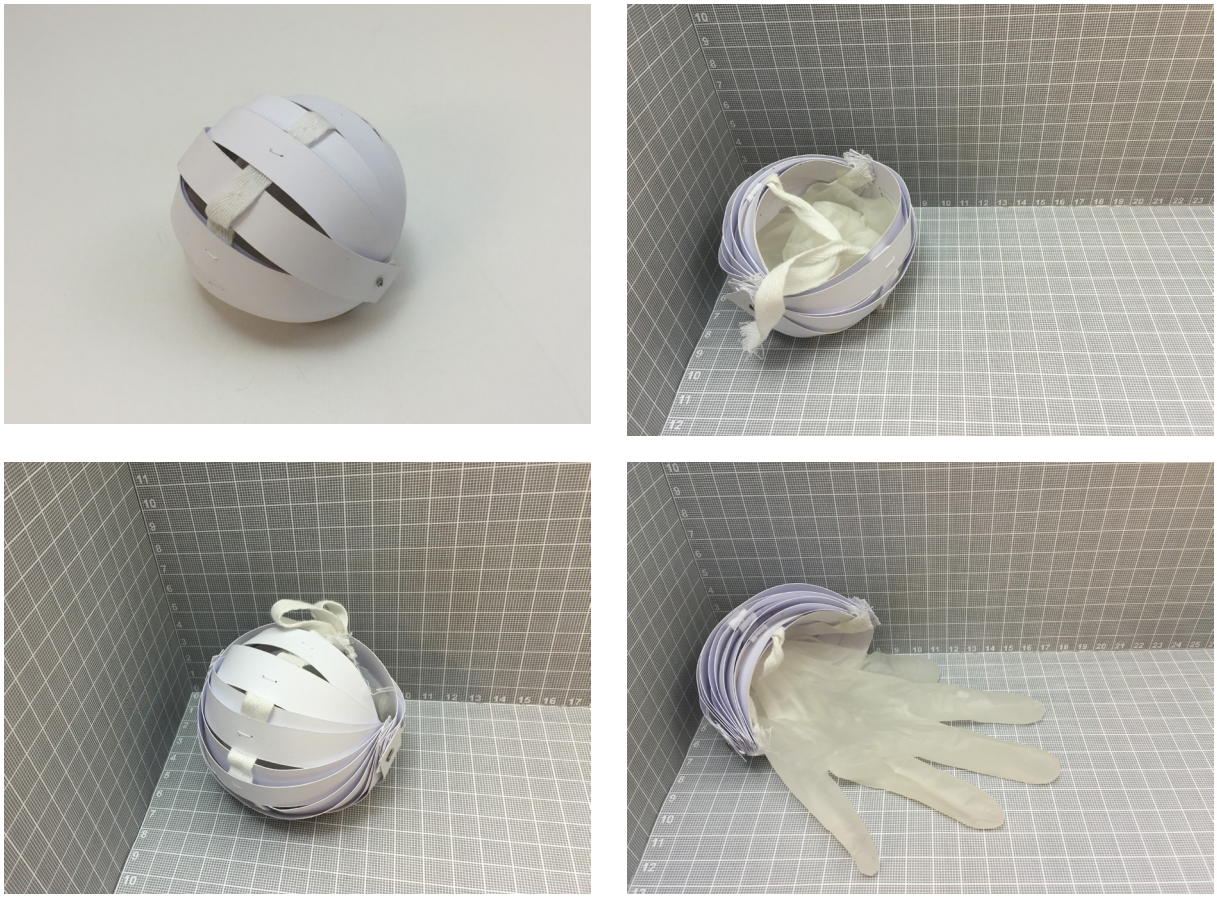
Figures 17.9 and 17.10: The gel ball hand.

EXTERNALISATION IN A LITTLE ANIMAL

Three different models were made for the concept of externalisation and they are called little animals. The three models are called the little birdie, the armadillo and the gravel hand. The birdie has a soft "belly" containing syrup and a harder outer shell. The birdie can be set in different positions between opened and closed. The birdie is shown in its different positions in figures 17.11, 17.12, 17.13 and 17.14.

Figures 17.11, 17.12, 17.13 and 17.14: The little birdie.

The armadillo is a round ball that with plates that can open up to show an inside that is a plastic glove filled with water that represent the softer inside. The armadillo is shown in figures 17.15, 17.16, 17.17 and 17.18.



Figures 17.15, 17.16, 17.17 and 17.18: The armadillo.

The gravel has a rough exterior made of glued gravel onto a glove made of fabric. Inside the glove is a plastic glove filled with syrup. The gravel hand is shown in figures 17.19, 17.20, 17.21 and 17.22.

TABLE 17.1: THE WEIGHTS OF THE DIFFERENT MODELS

Model	Weight (g)
Syrup	205
Gel balls	165
Fossil	51
Shard	134
Corner	150
Birdie	41
Armadillo	101
Gravel	188

Figures 17.19, 17.20, 17.21 and 17.22: The gravel hand.

PROCEDURE

The format of the test was a semi-structured interview with a few pre-defined questions and some space for the interviewee to talk about what he or she chose to bring up. The following procedure was followed during the evaluation test.

1. **Measuring their hands** by them putting their hand on a paper and drawing the outline.

2. **Semantic scale** on how the person was feeling at the moment to provide a baseline.

3. **Show them our visualisation of a panic attack cycle** to see whether it corresponds to their experience, if not, have them draw a new line according to their experience. Also ask them for how long each phase typically last.

4. **Evaluate concepts**
    a. Distraction stones
    b. Comfort hands
    c. Externalisation in the little animal

The order in which the concepts were presented was alternated between participants.

The participants were asked to close their eyes. The stones were placed in front of the participants and they got to explore them in their own pace, as the intention of use of the concept is to explore the surface.

Concerning the hand concepts, the participants were asked to hold out a hand and spread his or her fingers, and the glove was placed in the hand so that the fingers fell between the participant's fingers in order to mimic the intended use.

The dynamic models were placed in the participant's hand in its closed state, and when the participant had handled it for a while, the test leader opened it up a bit and place it back into the hand. After a while, the test leader opened it up into its final, most open state and replaced it.

Had the participant accepted having their hands photographed, the way in which they explored and touched the objects was photographed.

The participants were asked to "think aloud" and talk about their thoughts, feelings, reactions and associations to the objects as they explored them. When the participant seemed satisfied with exploring the objects themselves and once they had experienced all models of the concept, they were asked which one of them that would feel best to have in a panic attack, if any, and why or why not. Once they had chosen a model, they were allowed to open their eyes and see the models. The participants were asked to draw where on their panic attack cycle the sensory input could help, if anywhere. The participant was asked to motivate and explain their decision. Lastly, the participant was asked to fill out a semantic scale for how they feel with the object.

5. **Grade** the three models

The participants were asked to grade the three chosen models on its potential helpfulness in a panic situation, on a scale 1-10, where 1 is that they think it would not help at all or even make it worse and 10 is that they think it could be very helpful. This question was added to the test procedure after the first two tests had been completed.

A general discussion followed in which the participants were asked about what concept they liked/disliked and if they believed in the concepts as well as what they see as problematic with them.

6. **Explain** the ideas behind the concepts

Following this, the intentions and thoughts of concepts were explained to the participant to see if this changes their impression and if they believe in the ideas. This was done especially since the models of the externalisation concept were difficult to make and the models might not get the ideas across.

17.3 RESULT AND ANALYSIS

The results of the evaluation tests are presented below. The participants were in general surprised by being given a haptic input to focus on. One mentioned:

"I have received tips on how to think, but I have never gotten something to hold"

THE COMFORTING HAND CONCEPT

The result from the tests with the gel ball hand and the syrup hand is described in this section.

GEL BALLS HAND

The general impression of the glove with gel balls was that it was something exciting and fun. The users generally reacted strongly in a curious and happy way. The material was different from what they were used to, so it was difficult for many to place it mentally and many asked what the texture inside was. Having a strange texture placed in your hands had a surprising effect, which was evident in the evaluation tests. Most of the participants responded positively and with excitement, but there were also comments about the substance being "too much". The energetic way in which the balls move and clash against each other might trigger an nervous energy and a couple of the participants mentioned that the texture would trigger OCD-like behaviours of moving the balls around inside the glove and produce a nervous energy.

Some participants mentioned that the fabric surface texture was incongruent with the gel like, watery balls on the inside. The watery feeling gave associations to water animals and fish eggs and some thought it was unpleasant.

What the participants did like was the weight of the hand and firmer content (compared to other models) and they responded well to having something with integrity in its form and firmness. To some, the weight was not enough and they would like something even heavier. The association of a safe and secure human hand to rely on did not come across with the energetic balls and water animal associations. A safe/secure hand was incongruent with a surprising and fun content.

- Too much fun and too uncomfortable to be calming
- Water animal associations
- Large surprise impact - not calming

Figures 17.23 and 17.24: The gel balls hand.

SYRUP HAND

Some participants responded very well to the hand containing syrup.

"Participant: Wow .
Test leader: How does it feel?
Participant: It feels very nice, it's almost like a hand. But not the same feeling as hand because it is so soft. It is very pleasant to handle, it is more soft than finger like."

When the participants were given a product that they liked, they often forgot to "think aloud", instead they became quiet and they explored and experienced the haptic impression. For the participants that liked the syrup hand (four out of eight), they became quiet and calm. In the transcript above, it is obvious from the follow up question "how does it feel?". When they got an impression that they disliked, they were faster on saying it, as well as when they thought the impression was fun. When they liked it or had trouble placing it, on the other hand, they got more quite.

There was an obvious difference between the participants in that some immediately liked the syrup hand and could attach to it quickly. These participants liked having it between their fingers and did not mention the uncanny valley aspect of having a dead hand in their hands. The ones who disliked the concept did not like having it between their fingers and said that it made them think of a dead hand. The ones who responded positively mentioned it was like having a friend and that it was comfortable to have the fingers of the glove between their fingers and that they felt like being taken care of. One participant wanted to take care of the hand and not it to take care of her.

Concerning the texture, it varied between the participants who liked the product and they generally thought it was calming, and the ones who disliked it who were reminded of something unpleasant and slimy without integrity. One participant mentioned that he disliked it because it was difficult to control, as it was evasive and unreliable.

Some participants seemed able to accept the syrup texture and take it for what it is and they could fall into the comfort of the hand. Some of these individuals mentioned that they wanted it to be heavier, but they responded well to the even and slow texture. One participant mentioned that she thought that it could help her calm down.

"Participant: This is absolutely something that could be nice to have during meditation [...] to calm down and not being stressed.
Test leader: In what way does it calm you down?
Participant: It has a weight to it, it feels slow. [...] I think it is helpful in a panic attack to sit down, close your eyes, thinking about breathing and to have something to touch that removes the thoughts of what is stressing you."

Figures 17.25 and 17.26: The syrup hand.

Concerning the temperature, the participants mentioned that they liked it being colder than their hands as they get warm hands during panic attacks.

- Calming texture makes the person calmer
- Safe and secure hand
- Uncanny valley

BOTH HANDS

All of the participants said that they liked the fabric surface texture. When choosing between the gel ball and syrup hand, half of the participants preferred the one with gel balls and half the syrup. The ones who liked the syrup were all female and they seemed able to receive the comfort of the hands. As for the gel balls hand, it was obvious that the participants who chose it did it because they thought it was fun and fascinating, and three were male and one female. Seeing this information from the perspective of Brené Brown's research (please see *Chapter 9: Shame and vulnerability*), that more females and less of the male participants talked about the comfort from the syrup hand, is in accordance with the gender cultural differences of what men and women are ashamed of, where men are more ashamed of being seen as a weak than women. A reflection is thus that if women find it less shameful to be seen as weak, they may find it easier to accept comfort, as there is an aspect of being comfortable with others seeing you in a less strong moment in being sad and accepting comfort. The participants who did not want the comforting hand instead responded well to the fun and exciting texture of the gel balls, seeing it as a distraction and something fun to play with. When asked where in the panic attack cycle they thought the product could help, the ones who chose the gel balls focused on the phases in the beginning, the symptom scare, and to use it as a way of distracting themselves from the panic. Some talked about using it as something fun to handle and interesting to explore, others talked about the surprising impact of getting it in their hands that it could distract them from the panic.

The participants who chose the syrup hand talked about the comfort of the hand and that it could be helpful in the later stages, in the recovery phase. The syrup hand gave comfort, and during the recovery phase, the person is tired from the panic attack and needs recovery. A calming, safe and secure hand with a calming texture is peaceful at this state according to the participants who liked it.

One participant disliked both hands and thought that none of them in themselves could create a secure base but the gel ball hand might have the power to distract him. Concerning the syrup hand, he said that he could not attach to something that is experienced as alien and uncomfortable.

A couple of the participants mentioned the possibility to load the product with something positive such as a safety person they like and can trust or that using the product with successful outcome during panic attacks will give it an encouraging power, and following this, just knowing that it helps will transfer power to it and it will be helpful to keep the product with her.

SEMANTIC SCALES OF THE HANDS

The result of the semantic scales of the two comforting hand models were divided into calculations of two mean values, one from the individuals who chose the syrup hand (denoted as "M" as in melass) and the gel balls hand (denoted "G"). The two results were divided into two mean value calculations since it was obvious that the participants got quite different impressions of the two hands depending on which one they chose. The results are displayed together with a mean value of a semantic scale called "B" as in baseline to see whether the product made the participants feel different from experiencing the product. The circles around words on the semantic scales denote the experience that was aimed for concerning the concept. The results from the semantic scales are shown in table 17.2, 17.3 and 17.4.

The syrup hand

The values that stick out on the result from the semantic scale of the syrup hand were that the participant felt more calm, less alone, more relaxed and more comforted when experiencing the syrup hand than they were before, which was in accordance with the aims of the concept.

The gel balls hand

As for the gel balls hand, the result did not reflect on the intentions of the concept. The values that stand out are concerning feeling judged, focused on the sensation and exploration. These result reflect on the impressions the participants talked about when they preferred the gel balls hand over the syrup as they tended to focus on the exciting and fun aspect of the strange gel balls rather than receiving comfort from an object. As for feeling judged, the individuals who were reluctant to accept the hand as it was and feel the comfort it pro-

TABLE 17.2: THE SYRUP HAND

How do you feel?

	1	2	3	4	5	
Calm	M		B			Wound up
Unsafe and insecure (otrygg)					MB	Safe and secure (trygg)
Lonely					BM	Not alone
In control			MB			Without control
Curious	BM					Bored
Judged					MB	Accepted
Disliked					MB	Appreciated
Seen and validated			MB			Exposed
Tense			B	M		Relaxed
Trust in myself			MB			Insecure of myself
Unaffected					BM	Compassionate
Focused on myself				B	M	Focused on the sensation
Comforted		MB				Abandoned
I console			MB			I explore

vides, talked more about it being weird to have such a product in public.

Characteristics

When comparing the characteristics of the experiences, what sets them apart is that the gel balls were perceived as more irrational whereas the syrup hand was more predictable.

TABLE 17.3: CHARACTERISTICS

What characteristics does the experience have?

	1	2	3	4	5	
Reliable			MG			Unreliable
Irrational (lynnig)			G		M	Predictable
Interesting		GM				Boring
Exciting		G	M			Anxious (ångestfylld)
Inspiring		MG				Inhibiting

TABLE 17.4: THE GEL BALLS HAND

How do you feel?

	1	2	3	4	5	
Calm			BG			Wound up
Unsafe and insecure (otrygg)			G		B	Safe and secure (trygg)
Lonely				GB		Not alone
In control		GB				Without control
Curious	GB					Bored
Judged		G			B	Accepted
Disliked				GB		Appreciated
Seen and validated		B	G			Exposed
Tense			GB			Relaxed
Trust in myself		BG				Insecure of myself
Unaffected				G	B	Compassionate
Focused on myself				B	G	Focused on the sensation
Comforted		GB				Abandoned
I console				B	G	I explore

PANIC ATTACK CYCLE FOR THE HANDS

The participants were asked to mark out on a panic attack cycle where they thought that the hand model (syrup or gel balls) they had chosen could work, if anywhere. Figure 17.27 below is a compilation of the participants' answers.

As visible in the figure, the participants reasoned differently concerning where the concept might work. They focused mostly on the 2nd, 4th and 5th stage, being before the panic attack and in the recovery phases afterwards. Many said that they thought the syrup hand could calm them in the symptom scare phase so that they focused less on the symptom scare and avoided getting stressed up. This concept also had a large focus in the end of the cycle where it could provide comfort and consolation in order to recover faster. One participant said she wanted a product to help her recover faster so that she can go on doing something else after a panic attack.

Concerning the gel balls model, the focus was largely on the symptom scare phase, to have it as a distraction since the material inside was so strange and distracting. The participants drew longer circles, highlighting that they saw potential for the object to help them during a longer time span.

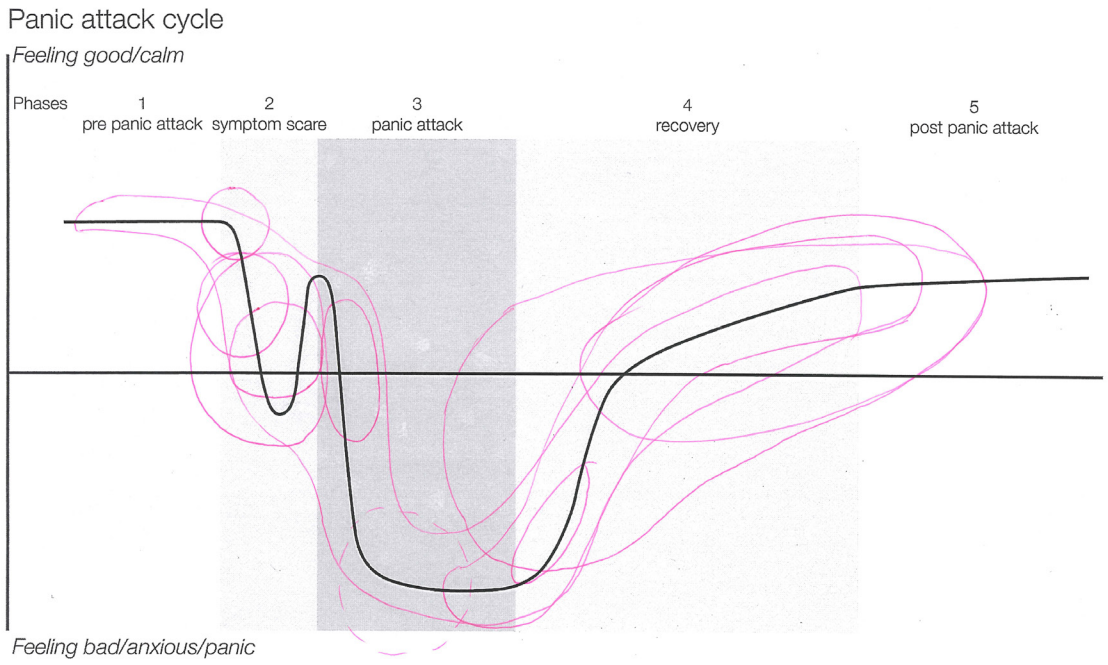


Figure 17.27: Panic attack cycle of hands.

THE DISTRACTING STONE CONCEPT

The result from the tests with the fossil, the cornerstone and the shard is described in this section.

THE FOSSIL

The participant responded well to the grip and smooth surface of the fossil. They immediately found a comfortable way of having it in their hands and started stroking the smooth top with their thumb.

"It feels like the steps in a castle that are worn down by thousands of people climbing them."

The participants mentioned that the different surface structures of the smooth top and the rough surface on the sides as well as the almost sharp meeting between them as something interesting to touch and explore. They were focused on understanding the form with their hands and once they found the smooth top, they spent some time stroking it. The way the cylindrical shape lies in the hand as well as the smooth top that is perfect for the thumb, made the participants attach quickly to the fossil stone and they were reluctant to put it down.

Most participants said that they liked the fossil, however they thought it was too small and to light weight, they wanted something larger and more substantial. An advantage with the small size was that it is not visible on the outside of the hand, but is easy to hide. One participant thought it was too comfortable to afford her with a distraction.

"It's a bit too ergonomic for me, of course it is nice for my fingers, but maybe that is not what you need in that moment. In that moment, you need something to focus on."

This points to that what impression is strong enough to refocus is different for different people, what is enough for some is too weak for others. What is comfortable enough for some is uncomfortable for others. Some liked the roughness whereas others thought the contrast between the roughness and the smooth part is too strong and uncomfortable.

- Fast attachment
- Liked the smooth place for the thumb
- Too small and too lightweight

Figures 17.28 and 17.29: The fossil.

THE CORNERSTONE

The users liked the weight of the cornerstone, that it is not flimsy and that it filled out the palm of the hands. It made the persons feel safe. One participant framed it in the following fashion:

"Being the smaller person in the context is a relief. The larger takes care of you. Like hold your mother or father's hand. The weight feels safe."

The corners of the stone function as a distraction and some liked the flatter surfaces. On the other hand, some participants found it difficult to find an ergonomic or comfortable way of holding it because it was too large in the palms. Others mentioned that it felt dangerous and destructive, they imagined throwing it through a window. The small bump on one side was a considered as a surprising element to focus on by some, and to others the surprise was of a negative character and uncomfortable instead.

- Liked the weight
- Good large size/too large

THE SHARD

The shard was ergonomic in its overall shape and lied well in the user's hand according to most users. Some thought it was too lightweight and others focused on the roughness in the surface structure, it gave more impressions than a flatter or smoother stone. Some mentioned that this stone was more aggressive and that it felt like one can hurt oneself on it and that it was uncomfortable and hard.

As for working for distraction, one participant said that the stone was active and that it can grab one's attention. Another talked about having something substantial and reliable to anchor to. Having something real in one's hand in a surreal panic situation.

"It lies best in the hand, I can wrap my hand around it and feel that there is something cold or hard, something substantial to anchor to."

- Ergonomic shape
- Distracting rough surface structure
- Too aggressive

Figures 17.30 and 17.31: The cornerstone.

THE STONES

In general, the stones were most appreciated when comparing the three concepts. The participants understood the stones when they got them in their hands, having their eyes closed, and they were surprised by how much they could experience with the stones. The texture feels safe, as it is something known and one user said that he did not fear losing his grip, as it is rough.

Concerning the size, shape and surface structure, the participants had differing preferences. Some liked that the cornerstone is quite large whereas others thought it was too large. There is a conflict in the desires to have a large stone that fills out the inside of the closed hands versus having a stone small enough to hide having it in the hands. Some users liked the more uneven cornerstone and rough surfaced shard since there is more to explore whereas others found them more difficult and almost stressful because they were difficult to get a haptic overview. Generally, the participants liked contrasts in the surface structure.

There are some inherent values of the stones in that they are ancient and have existed for thousands of years, providing a perspective on the panic situation. Stones are reliable; they will not break no matter how much pressure you apply to it, and it will not give in. One participant mentioned anchoring to a stone as a way of getting back to reality from the surreal panic, or as a way of not letting the panic spiral. He also mentioned conditioning the stone with calmness to make oneself calmer with it. Others also mentioned this function of the stones. They liked the reliability of the stones and the distraction they offer in their structure and irregular shape. Having a stone with you was often compared to a lucky charm or a necklace or jewellery to fiddle with and focus on. The stone offers the possibility to focus on how it feels to the touch and the differences in the surface, making it an entryway into mindfulness. Other participants mentioned the distracting function of the stones and one said that she could follow the form like a mantra.

"I focus on how it feels and on the surface structure, it distracts from the focus on how it feels in the chest and focus on the hand. [...] In the fall [before the panic] I might lose track of myself, but [it might help to find] my way back. I am here and this is in my hand, it won't break if I apply a lot of pressure. It gives as much pressure back as I apply. It takes from the focus on the feeling in here into something almost outside of myself."

At the same time, the stones give space for one to reflect. One participant can handle her panic attacks by getting wrapped up in a book, but she knows that reading does not give space to process the panic. The stones, on the other hand, give the space for reflection.

Figures 17.32 and 17.33: The shard.

"Test leader: Would these (the stones) give space for you to work with yourself?
Participant: I think so, I don't feel that it gives the same sort of escape (as preoccupying oneself with reading to handle a panic attack). Sure, I am keeping myself busy, but I have a crutch to hold on to. 'Ok, I am having a panic attack... ' When I read, I can't think at the same time. This has not words taking that kind of attention. I can focus on it without escaping the panic attack."

SEMANTIC SCALES OF THE STONES

As the participants were talking about roughly the same impressions of the stones regardless of which one of the stones they chose, the results for all of the semantic scales were calculated into a mean value for the stones, presented below. The letter "S" denotes the stones and "B" the baseline values that the participants marked out before experiencing any model. The circles around words on the semantic scales denote the experience that was aimed for concerning the concept. The results from the semantic scales are shown in table 17.5 and 17.6.

TABLE 17.5: THE STONES

How do you feel?

	1	2	3	4	5	
Calm		S	B			Wound up
Unsafe and insecure (otrygg)					SB	Safe and secure (trygg)
Lonely				S	B	Not alone
In control		S	B			Without control
(Curious)		B	S			Bored
Judged					SB	Accepted
Disliked					SB	Appreciated
Seen and validated		SB				Exposed
Tense			B	S		(Relaxed)
(Trust in myself)		S	B			Insecure of myself
Unaffected				S	B	Compassionate
Focused on myself				B	S	(Focused on the sensation)
Comforted		SB				Abandoned
I console				BS		(I explore)

The stones

What stands out in the results are that the participant felt less curious than they did before the test, which was not in accordance with the aim of the concept, on the other hand, they felt more relaxed, trusted themselves more, focused on the sensation and was slightly more explorative. These results points towards what the aim of the concept was.

Characteristics

Concerning the characteristics of the experience, the stones were experienced towards being reliable and predictable as well as interesting, which was a successful result.

TABLE 17.6: CHARACTERISTICS

What characteristics does the experience have?

	1	2	3	4	5	
Reliable		S				Unreliable
Irrational (lynnig)				S		Predictable
Interesting		S				Boring
Exciting			S			Anxious (ångestfylld)
Inspiring			S			Inhibiting

PANIC ATTACK CYCLE FOR THE STONES

The participants were asked to mark out on a panic attack cycle where they thought that the hand model (fossil, shard or cornerstone) they had chosen could work, if anywhere. Figure 17.34 below is a compilation of the participants' answers.

The figure shows that a lot of participants filled in areas where the thought the stones had potential to work, before, during and after the panic attack. They focused especially on the symptom scare part and the panic attack. They mentioned that they could imagine that the stone could be a safe object to distract them from the symptom focus before the attack, making them not having an attack at all or grounding them in the full-blown panic, that touching and experiencing the rough surface might bring focus to their hands instead of the raging panic and also providing a safe object to grasp tightly without worrying it would break.

For the stones the participants drew more and smaller circles, illustrating that they thought it had potential to help them during several phases of the panic but in smaller portions, it has the powerful potential of distracting them in portions.

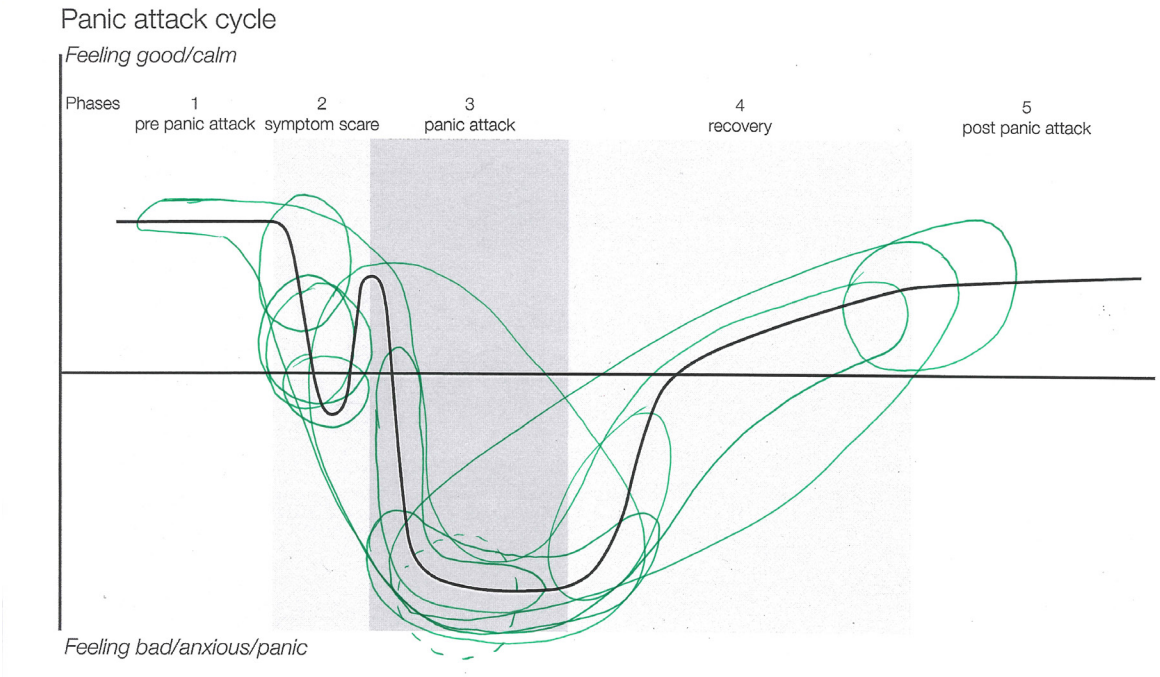


Figure 17.34: Panic attack cycle of the stones.

THE LITTLE ANIMAL CONCEPT

The result from the tests with the little birdie, the armadillo and the gravel hand is described in this section.

LITTLE BIRDIE

The general comment of the little birdie model was that the participant was afraid to break the model. They wanted something sturdier and tougher to hold on to in a panic attack, and they stated that they need to be able to trust that the product will not break. On the other hand, the smallness and fragility made some participant feel empathy towards the concept, one mentioned that she wanted to take care of it. The participant felt that it was not supposed to open up, and wanted to help to close it. To her, the frail experience of model made her feel like it was too frail to open up and that the birdie was not feeling well. Thus, the empathy turned into worry.

Some participants found the model difficult to handle as they felt that it was too small when closed and too large when opened. Some wanted something larger in the closed state and felt that it did not lie well in the hands in the opened state. There was also a contrast in the materials and textures that they disliked, some mentioned that it was too soft on the inside and that the edges were too sharp next to it.

The general impression was that the concept was too complex to grasp mentally without seeing the model. Some got associations to bugs, not necessarily gross bugs, more like a ladybug because of the hard exterior and softer inside. The users did generally not get the association of a small animal such as a bird, but were confused and disliked the contrasting surfaces, structures, textures and hardness to the touch. They did not understand why it opened up, and did not so much like that it changed size. Many of them were neutral toward the product, but some disliked it. They found it uncomfortable with the differing hardness of the textures and surfaces and did not understand why it was soft inside.

- Too fragile
- Difficult to understand the concept
- Dislike of contrasting surfaces and textures

Figures 17.35 and 17.36: the little birdie.

THE ARMADILLO

Some users found the armadillo fun at first but the change in the product was experienced as unexpected and unpleasant. They liked the shell but the thought inside was an unpleasant experience. Unpleasant because what was inside was unexpected and the fingers inside came out unexpectedly. It took the user by surprise, which they generally disliked. They liked the surprise of experiencing the surface when the ball was closed and put in their hands, but the surprise was shocking as the model opened up to show its colder and softer inside. Some mentioned associations with crustaceans, and not in a pleasant way.

When the model was semi-opened and the users handled the model, parts of it came out in an erratic fashion, which was not met with pleasure. Some participants mentioned that they get very warm hands during panic attacks so they liked how cold the inside of the armadillo, the plastic glove filled with water, but that the viscosity was too low. They disliked how it is not possible to create a form, but that it just floats out. One participant compared it to separating an egg yolk in the hands. Other associations were the teat from a cow, something dead, an armadillo, a snail and an octopus. Some participants got the impression that something is not right with the inside of the model. They said that it should not be where it is, it should be in the water and that it is dying.

Many users did like the shell of the armadillo, they liked the initial state when it is closed. One user liked throwing it around, like a ball. He liked it being a game to distract from panic attacks. One user said that it could be an interesting surface to focus on to distract from the panic, a way to channel the nervous energy into an action during the start of a panic attack.

- Fun at first
- Unexpected and unreliable when opened

THE GRAVEL HAND

The gravel hand got quite unanimous impression of it being unpleasant. They disliked the harsh surface transitions and got the impression that the outer surface is aggressive against the person holding it. It is protecting its inside. Some participant preferred the softer inside. Some perceived it as treacherous, that it has a soft and nice inside but that it could turn in a second to a hard and rough outside.

"Oh, this was scary! The surface changes are scary. Can be because I am having my eyes closed, but this is uncomfortable. It feels like an animal will come out and bite me."

One participant put it aside immediately due to the discomfort he felt. In addition, it gave confusing impressions. The hard and rough surface and the soft inside were conflicting.

Figures 17.37 and 17.38: The armadillo.

The inside is soft like a cuddly toy, whereas the outside is rough and aggressive.

- Immediate dislike because it felt unpleasant and confusing

ALL OF THE LITTLE ANIMALS

All in all, the little animals were not experienced as pleasant. The models did not convey the ideas of the concepts and the users generally disliked them. Following the haptic experience test was a discussion in which we explained our thoughts of the concepts, which was especially rewarding for the little animal concept. Most participants who disliked the models got a new impression of the concept and getting the reflective ideas of having empathy towards something else in order to have it to oneself resonated with them. They liked the idea and said that had that been known they might react differently to the experience. One participant said:

"I don't see it as trash anymore, I got a lot more respect for it now than before."

This concept requires more reflection before use and in a real use situation, the haptic impression is as important as knowing the idea behind the product. One participant suggested receiving instructions together with the product, similar to the tool of breathing in a square. One participant questioned whether one can handle such a complex idea in a panic attack and others talked about having performance anxieties if the product is opened automatically and one cannot follow the pace in lessening their panic attack. This pointed to an important aspect of who retains the power in the concept and that it is better for the user to get the power and action of opening up the model compared to having a product that opens automatically during the process of the use. The users mentioned that they preferred having the control and power to open it the extent they felt ready.

Figures 17.39 and 17.40: The gravel hand.

SEMANTIC SCALES OF THE LITTLE ANIMALS

The models gave very differing impressions, making it difficult to consider the impression similar enough to calculate a mean value of the concept. The difficulty in dividing the results is that they were differing too much to make meaningful categories. In order to present the result in any way and not presenting the individual semantic scales of the participants, a mean value has been calculated, but bearing in mind that it is like comparing apples and pears since some participants considered the armadillo to be a funny ball to throw around and others liked the hand holding aspect of holding the plastic glove inside.

The letter "A" denotes the mean value of the little animal models and "B" is the baseline of the participants. The circles around words on the semantic scales denote the experience that was aimed for concerning the concept. The results from the semantic scales are shown in table 17.7 and 17.8.

The little animals

In total, the little animals did not change the way the participants felt towards what was aimed for in the concept, they were not feeling more safe and secure, accepted and compassionate. They were feeling roughly the same level of being in control and seen and validation and a bit more relaxed. The undramatic result can however be a consequence of people rating the animals very differently, and thus, the mean value ends up in the middle.

TABLE 17.7: THE LITTLE ANIMALS

How do you feel?

	1 2 3 4 5	
Calm	A B	Wound up
Unsafe and insecure (otrygg)	A B	Safe and secure (trygg)
Lonely	AB	Not alone
In control	AB	Without control
Curious	BA	Bored
Judged	AB	Accepted
Disliked	A B	Appreciated
Seen and validated	AB	Exposed
Tense	B A	Relaxed
Trust in myself	BA	Insecure of myself
Unaffected	A B	Compassionate
Focused on myself	AB	Focused on the sensation
Comforted	AB	Abandoned
I console	AB	I explore

Characteristics

The characteristics of the experience more irrational than predictable and towards being interesting and inspiring, but the results are not too strong.

TABLE 17.7: THE LITTLE ANIMALS

What characteristics does the experience have?

	1	2	3	4	5	
Reliable			A			Unreliable
Irrational (lynnig)			A			(Predictable)
(Interesting)		A				Boring
Exciting			A			Anxious (ångestfylld)
(Inspiring)			A			Inhibiting

PANIC ATTACK CYCLE FOR THE LITTLE ANIMALS

The participants were asked to mark out on a panic attack cycle where they thought that the hand model (birdie, armadillo or gravel hand) they had chosen could work, if anywhere. Figure 17.41 below is a compilation of the participants' answers.

The participants gave quite differing answers as to where the object might help depending on what function they attributed to it. Some saw it as a distraction in the beginning and others that it would be helpful towards the end as it was cosy to handle. One participant mentioned that she thought the armadillo was an all in one solution offering at first a distracting feature of the lamellas to fiddle with to channel the nervous energy in the beginning of the attack and then the cold hand inside to hold on to calm down in the end of the attack. The circles drawn are longer, illustrating that they thought the little animals could provide help during longer parts of the panic attack's phases.

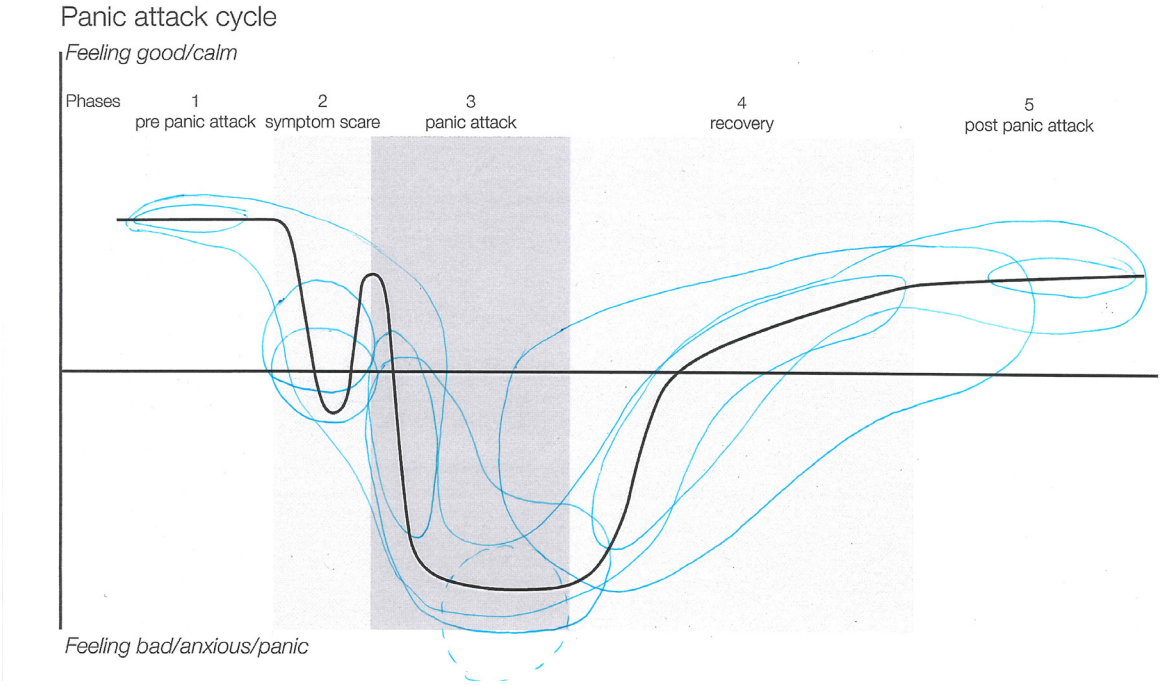


Figure 17.41: Panic attack cycle for the little animals.

OVERALL COMMENTS AND IMPRESSIONS

In this section, a compilation of the results, as well as the opinions of expert 2, are described.

INDIVIDUAL PREFERENCES

It became very obvious in the tests that one size does not fit all. The individual differences were large when it came to both the general things such as if they liked the stones or the hands and in the details such as which of the stones they hated or loved. Most participants hated the gravel hand, but one found it fascinating and liked it. Some individuals wanted something that was warm whereas others wanted cold. The participants were asked to rate on a scale 1-10 where 1 is that it would not help at all in a panic attack and 10 is that it would be very helpful in a panic attack, how helpful their three favourites from each of the concepts were. Most of the participant did give a rather high grade on at least one of the models, suggesting that even though they had strong reactions of like or dislike on the products, they could find something they liked, giving it a grade higher than 7, please see table 17.9.

A person with experience of working with mental health care and with personal experience from panic attacks and mental health issues further mentioned that she appreciated the fact that there are several concepts to choose from. She appreciates that there is not one solution that is supposed to work for all individuals but that there is space for the persons with panic attacks to be individual in how they are feeling. Her experience from the mental health care system is that it is seldom adapted to the individual but that one has to fit a predefined role of how one is supposed to feel. This can be very constricting and frustrating, as there is no space for the different ways in which people can suffer as well as the different needs they may have in this. According to the person, a strength of this project is how open it is for the ways in which people with panic attacks feel and that it does not try to put individuals in a diagnostic box.

POSITIVE ASPECTS MENTIONED

- *Snap out* effect from the contrasting structures of the fossil and the coldness in the armadillo
- Weight is important (kinaesthetic haptic impression)
- Process: Fiddling (moving around, searching) with the gel balls in the gel ball hand model and exploring the surface of the stone
- Portable and hideable: to bring in public places and be able to hide in hands/purse/pocket

TABLE 17.9: THE POINTS AWARDED BY THE PARTICIPANTS.

Category	Model	P26	P25	P4	P7	P24	P5	P27	P14
Comforting hands	Syrup		X	7,5	7				7
	Gel balls	X				5,5	2	4	
Distraction stone	Fossil		X		8	8,5		8	
	Shard						7		
	Cornerstone	X		5,5					4
Externalisation in a little animal	Birdie			4,5	8	3,5			
	Armadillo	X	X					5	8
	Gravel hand						6		

- Concretised but not visual: liked not having to look at the object to use it, liked having emotions visualised

NOTHING AT ALL HELPS IN THE PANIC PHASE

Some participants avoided marking out the third phase of the panic attack cycle, not because they seemed to not believe in the product per se, more because according to their experience, nothing helps in that phase. They have no control in that phase and there is total panic. Thus some said that they were doubtful that anything would help in phase three. One participant had learned through CBT to handle the panic so that it did not go into the third phase, the full-blown panic, and since this had helped him, he wanted solutions to help him in the second phase, the symptom scare. He was hesitant to mark out the panic phase since he genuinely did not want it to get there and did not even want to think about being in the panic phase. For some participants, the panic phase was too difficult to even think about so they avoided that phase.

KEEPING IT SECRET BECAUSE NO ONE CAN HELP YOU

One participant mentioned that he wanted a smaller, hideable product since he did not want to be stigmatised by others for his panic attacks. In addition, he said that no one can help you in the panic, you are there on your own and therefore he wanted to keep it secret to himself.

PROBLEMS IN THE PUBLIC ARENA

When asked for potential problems of the concepts, many participants mentioned using the product in the public space and other people seeing you having the product, especially the models of hands as they made the users think of the uncanny valley and that it is strange to have such a product in public. Interestingly, many of the participants mentioned being on the bus as an example of the being in public where they would feel self-conscious of having a strange product with them. Public transport is something that many individuals with agoraphobia find difficult as they feel like they are trapped with many people being able to see them without them having the ability to flee. There is an aspect of being closed in with strangers on a bus, where they have a chance to see what you are doing and scrutinise your actions that may be the reason why several participants mentioned the bus as a place where they may feel uncomfortable with a product that is visible. Many of the interviewees throughout the project have mentioned that they are very self-conscious of others seeing them feel bad and having panic attacks.

The general comment concerning potential problems of the products is how hideable or visible the products are, most of the interviewees mentioned that they wanted to be able to keep the product to themselves so that others can not see it in a public space. Having the user choose to what extent they want to show the product to others is an empowering feature as the power is given to the user to choose how much or how little they want to display their issues and the product they have to help them. There is always a balance between prioritisation as well, as one participant mentioned:

"I guess the question is also what is the most important - people laughing at you or getting rid of the anxiety."

THOUGHTS FROM EXPERT 2

Expert 2, the physiotherapist and psychotherapist that was interviewed in the beginning of the project was contacted in order to provide an expert's view on the concepts. During a phone call the concepts were explained to expert 2 and she commented on them. All together expert 2 though that the concepts were good and said that in order to know if it helps in a real situation it would have to be tested. Expert 2 focused on the aspect of how the concepts gave space to experiencing the panic and the thoughts connected to it in order to accept it and then use the stimulus to refocus. She said that she thought it was a good idea to provide something to hold onto, especially during panic attacks when the person is alone or waking up with a panic attack.

Safety behaviours

One important aspect expert 2 focused on during the first visit was the risk of creating a safety behaviour and that there needed to be space in order to accept the panic attacks and reflect on them. She said that the products could function as something the person could use less and less in steps, at first they might need the object but as time passes and they have situations with positive outcomes, they could stop using the objects and then realise they do not need them. She mentioned that an object could help persons to trigger themselves with calmness and help them ground themselves when they feels stressed, and enable them to carry on with what they are doing. She compared it to a form of attention training to focus on something else than what one is afraid of. Having something to hold on to for focus was a good idea according to expert 2. In the longer perspective the individual would learn to calm down without the object and in this way the product is not becoming a safety behaviour. Expert 2 also pointed to the fact that it is difficult to tell what is a safety behaviour and what is just a normal behaviour and that one should not be too harsh concerning safety behaviours if it functioned in a way so that it could be used less and less. Some people with panic disorder carry their medicine with them in order to not worry about getting a panic attack and this is not considered a safety behaviour. Expert 2 meant that carrying a product is not worse than carrying a tablet.

The concepts

Concerning the stones, expert 2 thought that it can be helpful having a distracting stone to practice mindfulness as it needs practicing. She mentioned that it could be a good idea to practice mindfulness in a non-panic moment, as it might be difficult to do this during a panic situation.

As for the externalisation concept, expert 2 thought that it might be helpful having an object to use as a gateway into doing positive affirmations. Some individuals might find it difficult to start doing positive affirmations to on themselves straight away and having something to say nice things to could be a stepping-stone. Expert 2 mentioned that it has been shown that doing positive affirmations may not work as well as thought previously, as people with a low self confidence might feel even worse as they experience that they are failing at yet another thing, whereas people with a good self confidence can become narcissistic, so it works "too" well.

Expert 2 said she thought having a comforting hand was a good idea as a way to help recover from a panic attack, especially since one is tired after the full-blown panic and need recovery. She compared it being as tiring as if one had run a marathon.

Conditioning calmness

In conclusion, expert 2 focused on the learning and conditioning perspective of all of the concepts, that if the user starts using the objects and they work to calm them down, they will learn and get conditioned with calmness so that it will be enough to look at the object in the future to be calmer. She compared it to autogenic training and thought that the concepts presented could work in the same fashion. She also thought that it was good with different concepts as different persons react positively to different things.

17.4 REFLECTIONS

This section discusses the result from the panic attack cycles, the possibilities for productification that was seen as well as the risks of safety behaviours.

THE PANIC ATTACK CYCLES

The result of placing the potential of the products on the panic attack cycle (figure 17.42) was in accordance with the intention of the concepts, but seemingly for different reasons.

The intention of the stones was to afford a distraction in the early phases of the panic attack, the hands to offer comfort in the recovery phase and the little animal to offer externalisation in order to be empathic towards oneself. It became obvious during the tests that if the participants liked an object, e.g. the fossil (which was very popular), they tended to place it in several places in the panic attack cycle, both for distraction in the beginning and in the end. The sizes of the circles were in general larger for the hands and the little animals, witnessing of these impressions being suitable for a longer haptic experience than the stone. The stones on the other hand had much smaller circles, showing a stronger belief in their potential at several places during the attack. The little animal models did get long circles throughout the attack, similar to the intentions of the product, but in the conversation it was obvious that the participants did not get the perception of empathy as intended. On the other hand, if the participants marked out that they saw potential for the object for other reasons, it can be viewed as having the potential for success anyway.

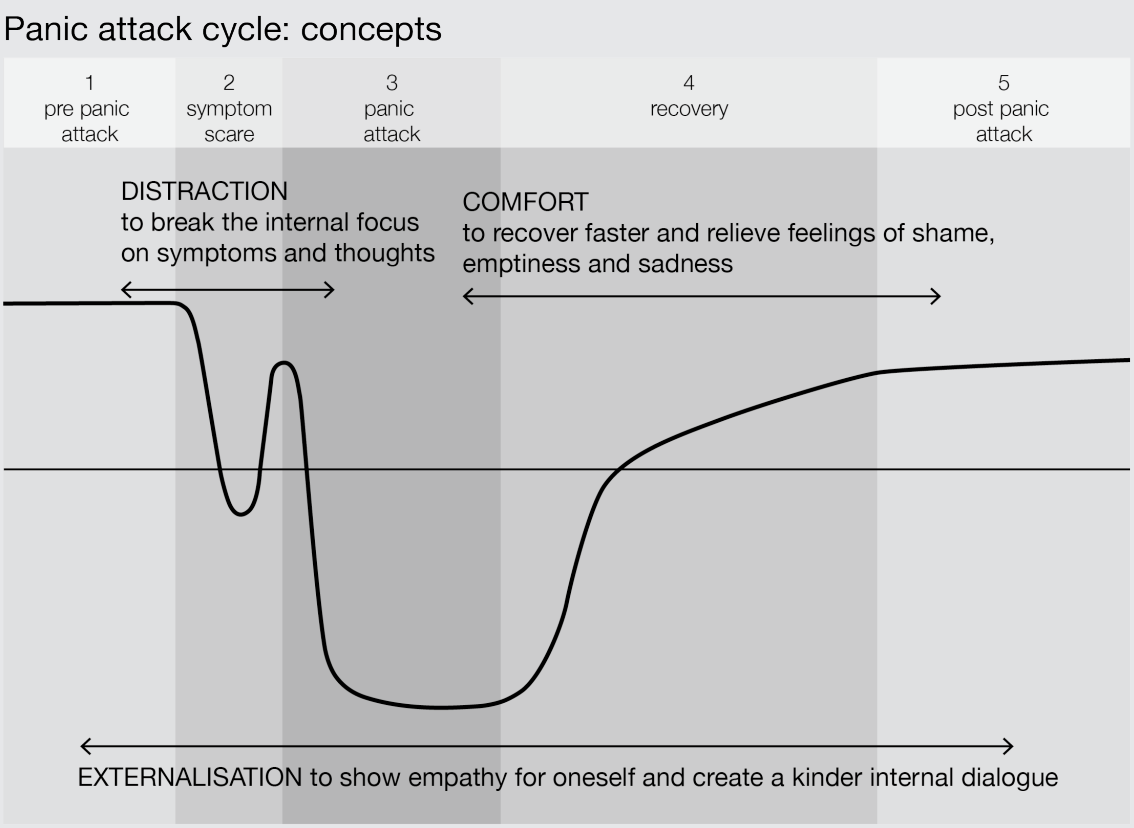


Figure 17.42: The potential of the products in a panic attack cycle.

So, from an evaluative perspective, the little animals did not convey the idea, but from an explorative perspective, the impressions the participants got from them are helpful in the future iteration of the concept.

The general impression was that if the person liked the object, especially the fossil and the syrup hand, they attached to it quickly and saw potential for the object and marked it as having potential in several areas of the panic attack cycle.

PRODUCTIFICATION

The stones seemed to resonate well with the participants as an object for distraction. The difficulty with the stones is how to productify them. There are ways of using the effect of stones, but raising the function of the object into e.g. by making into an object on a keychain to make the person carry it with them, as well as mask it as another type of object than an anxiety stone. Other ideas are to make it into a jewellery or some other type of lucky charm one can bring with oneself. Other possibilities is to use other materials such as metal into creating a rough stone shape in a beautiful metal colour that raises the value of the object and creates something that could be kept out at home on the coffee table as an interior design object. If metal is used, a metal that changes colour from wear can create an object that changes with time and use so that it, e.g. can be more shiny and a lighter colour at the spot where the thumb strokes it. Raising the stone into a more beautiful object can give the user a sense of more value of the object. However, taking away the factor of the product being an actual stone might also reduce the value of the product. The stone is associated with calmness and nature, and it has the ability of making the user gain a perspective of time and importance. The stone has been around forever, and it will not change or behave differently when used in a panic situation.

Concerning the hands an argument of the risk of creating something that fits into the uncanny valley exists. During the tests it was obvious that some individuals reacted strongly and negatively towards the hands and it made them think of a dead hand or a tragic replacement of a real friend. An analysis of this is that some individuals are not receptive to this type of comfort. This is based on the fact that others loved the hand and could attach and connect to the product without talking too much of the uncanny valley. Some even mentioned that they liked that it was similar to a human hand in shape. There are inherent values of the shape of a human hand and despite ideas of trying to change the shape into something that could fit inside the user's hand, there is a value to the actual shape and size of the hands used. The participants that did like the hand and seemed able to receive the comfort of the hand talked less about the uncanny valley, thus, there is a value in keeping the shape and instead working with the materials and surface. A way of individualising the hand concepts is working with choices of colours and materials on the surface textile, some individuals preferred something that felt colder and others warmer, thus having different covers in linen and wool could offer a colder and warmer experience respectively. In addition, the users can be offered different colours. The cover can also work an empty canvas on which the user can choose to create what they want, making an embroidery to represent something or spraying with a safety person's perfume. As one participant suggested, one can get an exercise from their therapist to load the product and create a story around it so that it means something to the person. Concerning the material, an inside similar to syrup or the gel balls can be created using plastics and silicone materials.

As for the little animal concepts, the ideas have good potential for productification according to the discussion following the test in which most participants responded well to the idea. The object would need a further iteration of its appearance but following the interviews is the impression that making the model a simple representation of something that is closed and can be opened can be enough. There was a clear opinion that the participants would prefer to open the object themselves in accordance to how open they feel and not have it open automatically as this might cause confusion, stress and performance anxiety. Having the person open it itself gives power to the individual. Alternative ideas of how to illustrate something that is closed and opened is e.g. referencing flowers in having a tulip shaped object that can open its petals. The idea of having a small animal to take care of did not come across well and the participants experienced it as more uncanny valley than taking care of something, which is why referencing a flower or simply an object, like a ball, that can be opened and closed is an idea to iterate. Even though the person chooses how much and how fast to open the object, it can be created in a way so that the material becomes more flexible as it heats up, making it more able to open, using e.g. a plastic.

RISK OF SAFETY BEHAVIOURS

As mentioned previously, there is a risk of creating a safety behaviour when creating an object against panic attacks. According to the tests and the comments from expert 2 points to that using a haptic impression gives space for thoughts to process the panic attacks in a way that enables the person to first make it OK and accept the panic attack and then use the product as an object to refocus on and hold on to. Giving the space for acceptance and reflection on the panic attacks is the way we think one can avoid creating a safety behaviour with a product.

17.5 CONCLUSION

In conclusion, the idea of the comforting hand came across best in the model containing syrup as it was deemed a comforting and calming object. The stones all offered distraction and fascinated the participants, and in addition, the stones contained a lot of inherent values of being ancient and reliable, which the participants reacted positively to. Lastly, the little animal models struggled in conveying their message on their own. When the basic idea was explained the participants thought it made sense to them and they believed in the idea, but the models themselves did not convey it, thus for this concept further explanations are needed in order for it to work.

All in all, the three concepts (one from each category) that we saw as the most promising was the syrup hand, the fossil and the little birdie.

GUIDELINES

- One size does not fit all
  - Offer several different product with different functions
  - Provide the possibility for individualisation
  - Make the object meaningful to the person by e.g. creating a story

- Improve the little animal concept
  - Refine the idea and model
  - Power to the person - let the user decide how much the object opens
  - Provide an explanation of the idea behind the concept

- Weight increased safety and security

18. THE FINAL CONCEPTS: FIGHTING PANIC WITH HAPTICS!

The final concepts in this project were *the comforting hand,* *the distracting stone* ***and*** *externalisation in a little animal.* ***The three concepts are explained below with the intended effect and intended use. The personas from*** *Chapter 10: The faces and phases of panic attacks* ***are also revisited to see how they use the products and if they are helped by them.***

18.1 THE FINAL CONCEPTS

The concepts, please see figure 18.1, presented in this section are the final physical outcome of this project. In this case, the effect of the product, and the experience it gives the user *is* the product. Thus, the intended effect and use of the product, as well as the ideas on how the products could be personalised to fit the specific user is presented to describe the concepts. The technical construction and manufacturing of the products are out of this project's scope, and thus this is not taken into consideration.

Under *personalisation*, ideas for how the concepts could be personalised for the individual users are presented. The ideas offer a basis for where a further development of the concepts could start.

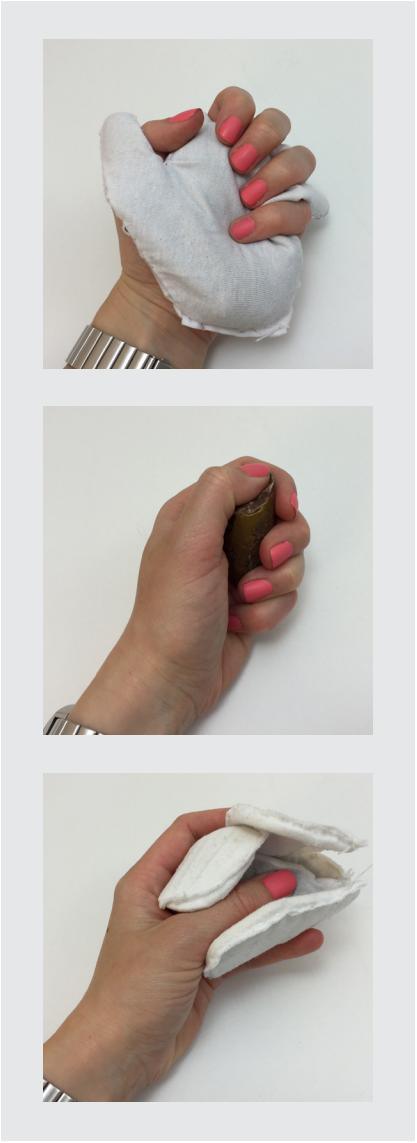


Figure 18.1: The final concepts.

THE COMFORTING HAND

The comforting hand has the shape and size of a human hand, a syrup consistency and a soft surface texture (figure 18.2).

EFFECT

The intended effect of the hand is to comfort the user and help them feel more safe and secure in the panic attack and help them recover from the panic attack faster. This is done by the product having the shape of a human hand, which is a property that can be associated with comfort and security. In order for the product to be *better than real* and avoid the uncanny valley, the consistency of the product is very dissimilar to the consistency of a human hand, thus making it a product of its own and not just a replica of a human limb. Moreover, the product offers something to focus on in the outside world, helping the user to turn their focus from the pain within, to the world around them. Aside from the major effect of offering comfort, safety, security and distraction, the hand can also give the user calmness. Interaction with syrup hand is slow due to the high viscosity of the syrup. Thus, an intended effect of the syrup hand is to calm down the user, making them adjust to the slow pace of the hand.

The hand also aim to help users that are uncomfortable with human interaction during a panic attack, or in other situations, by giving them a possibility to connect with an item somewhat similar to a human. We hope that this could give the user some of the positive effects of interacting with another person, and help the user let people come close to them.

Furthermore, we believe that the hand can help people that have safety persons to dare to do things without the support of the safety person in question, by offering them a non-human extension of the safety person. Thus, the hand can be a middle step between the user being alone and together with another person, independent on which of the options they feel safe with.

Figure 18.2: The comforting hand.

USE

The hand should be used when the user has a need for comfort, consolation and a distraction from the thoughts and symptoms. This can be different for different users, but in the haptic evaluation test, most users felt that they wanted to use it in the symptom scare phase, and in the recovery phase.

The product should be held in the hand of the user, with the fingers of the product tucked in between the fingers of the user. Thus, the product should be held the same way as one would hold the hand of a loved one (figure 18.3).

When not used, the hand can be stored in a purse or bag. However, during use, the hand is not the most discreet product due to its size and shape. It extends beyond the user's hand when they are holding it and it has an unfamiliar shape. However, the hand could be explained away as a stress ball if people around the user wonder what they is holding, and the user does not want to disclose the real purpose of it.

PERSONALISATION

Dependent on the user's preferences, the hand can be modified. The surface texture of the hand could be altered by changing the cover, and the consistency of the hand can be altered by changing the filling. Thus, the hand can be custom-made to a person. For example, one user might like a product that expresses a badass attitude, and the cover can be changed into leather. Another might like to have the hand with the gel ball consistency and the product could achieve a more curiosity evoking effect.

Figure 18.3: Holding the comforting hand.

THE DISTRACTING STONE

The distracting stone has multiple surface textures, as the fossil in the previous chapter. Most surfaces are rough, while one offers a smooth texture. The distracting stone has a cylindrical shape with a diameter of approximately 3 cm and a length of approximately 6 cm (figure 18.4).

EFFECT

The stone has the primary effect of offering a strong haptic input that can distract the user from their internal focus on thoughts and bodily symptoms. At the same time as the stone gives the user an interesting surface to haptically explore and distract themselves with, the stone is also offering an effect of calmness and attachment to nature. Furthermore, the stone is a hard object, which can be preferable for some users. Firstly, the hardness can be easier to "meet" in a panic attack, since it is more similar to how you might feel. Secondly, the hardness and roughness can offer the user a possibility to feel a very strong input if they squeeze the stone very hard. This can replace the need of hurting oneself since such behaviour can be based in the need to feel a strong sensation that can help them refocus from what is hard to handle within. This strong haptic input, via the natural and familiar stone, can also help a user to become less detached from reality, since the stone can remind them of the world beyond the panic attack.

The smooth surface of the stone is offering the user a pleasant and calm haptic input that contrasts the rough surface. This could be a place for rest and relaxation, or further exploration of the complexity of the surface.

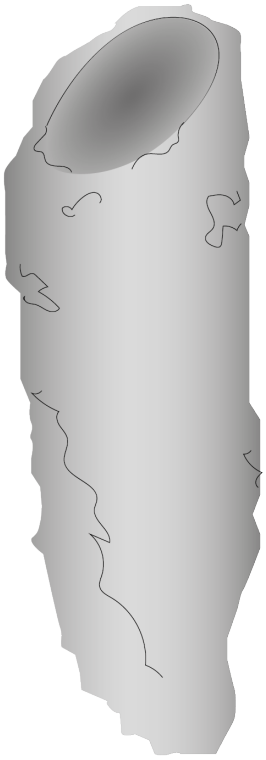


Figure 18.4: The distracting stone.

USE

The stone should be used in situations where the user is in need of a distraction from their thoughts or symptoms. In the haptic evaluation test, the test participants seemed eager to use the stone in many phases of the panic attack. However, the emphasis was on using it during the symptom scare phase. Furthermore, many people seemed to enjoy the stone, and thus the stone concept is probably a good all-round tool for helping many different persons deal with panic attacks.

The stone is held in the user's hand, and the user can explore it with his or her fingers. If the user wishes, they can focus on either the rough surface or the soft, almost polished surface, or both (figure 18.5).

The stone is fairly small, and so it can be hidden in a purse or a pocket when it is not in use, or hidden in the hands of the user while it is used. Moreover, if the user wants to keep the purpose of the product disclosed, a stone is a very neutral object that can be in the pocket or hands.

PERSONALISATION

A stone can come in many different shapes or sizes, and dependent in the user's preferences, a larger or smaller stone, with smoother or rougher texture can be preferable.

Furthermore, one can create a product with properties, such as roughness and weight, similar to a stone, but with another material to achieve new values in the stone. The product could for example be made out of metal, enhancing the heat transferring properties and giving it a whole new product expression. Such a product could be made very beautiful, and maybe serve as a piece of art in the home of the user. However, the down-to-earth properties of the product might be lost if the stone was in fact not a stone.

Figure 18.5: Holding the distracting stone.

EXTERNALISATION IN A LITTLE ANIMAL

The little animal comes in the shape of an abstract baby bird and is small enough to fit in the palm of a hand. The material is flexible in order for the parts to move, but the back and outside of the wings feel hard and sturdy to the touch, while the stomach and the inside of the wings are soft and smooth. The birdie looks and feels different depending on how the user has manipulated it. If the birdie is curled together like a ball, the product feels fairly hard, and if the birdie is opened up it has one harder side and one softer side. The hard surfaces are shown in grey and the soft surfaces are shown in blue (stomach of the bird) in figure 18.6.

EFFECT

The effect of the birdie is to assist the user in showing empathy for themselves, and to give the user an opportunity to mirror their feelings. Furthermore, as for the other products the intended effect of the little birdie is to help the user focus on something in the external world, rather than putting all of their focus on the reactions that happens within. This concept does this by transferring the feelings and bodily reactions to something in the outside world, making the user reflect upon their state from another point of view.

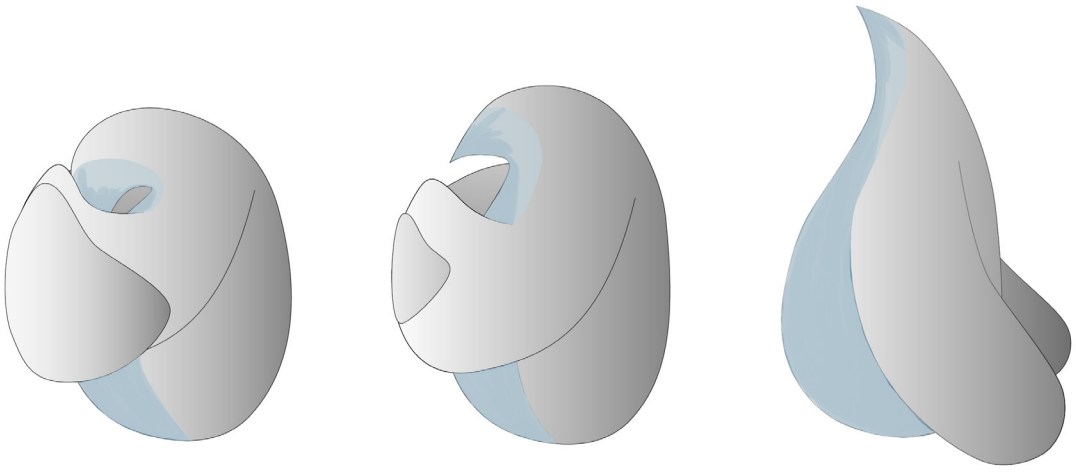


Figure 18.6: The little birdie.

USE

The little birdie should be used by persons who have a harsh inner dialogue and have a need to be more empathetic to themselves. The use of the little birdie is more long-term, and the person using it needs to work a lot with themselves with the product, preferably with the assistance of a therapist. Thus, the little birdie has a more specific target group, and we do not believe that this is a solution that will fit all. However, we also believe that the effect of the little birdie could be great for those persons in need of it. The results from the haptic evaluation test were mixed, but many people thought that the product could be used in the entire panic attack.

When using the product, the user holds the birdie in their hands, and manipulates it to make it mirror the state in which the user is. Thus, if the user feels tense, stressed and anxious, the birdie's wings should be closed. The user should then use the birdie as a reflection of their emotions, comforting and showing empathy for the birdie and comforting and showing empathy for themselves through the birdie. When the user changes their state of mind, the birdie should follow. Thus, if the user feels a little less stressed and anxious, the user should open up the wings of the birdie, in an amount responding to their emotions, revealing more of the birdie's soft parts. The user should then continue with the process of comforting and showing empathy, and reflect their state of mind in the product. The use of the little birdie is shown in figures 18.7 and 18.8.

The birdie is rather small and can be stored in a bag or purse when it is not in use. Furthermore, the product is small enough to be hidden in the user's hand while it is used. However, if the user wants to look at the product when it is used, or manipulate the shape of it, it is harder to hide. The expression of the product is similar to a stuffed animal, and thus is could be explained as such is the user wishes.

Figures 18.7 and 18.8: Holding the little birdie.

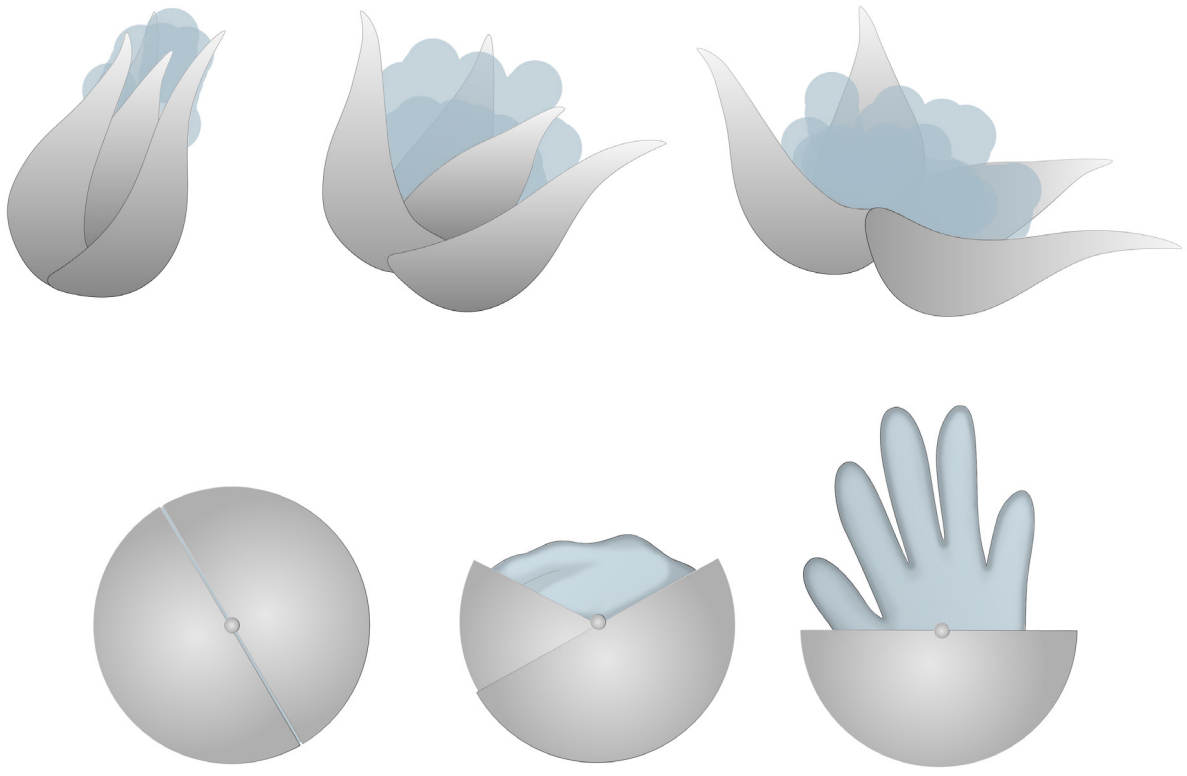
PERSONALISATION

To some, the shape of a bird might seem silly. However, we believe that this concept could be illustrated in many different ways. The product could for example have the shape of a flower that can open up, or just be a ball that can be opened, see figures 18.9 and 18.10. The two things that we believe is important is that the product has the ability to evoke empathy in the user, and that it has the ability to dynamically reflect the user's state of mind.

THE CONCEPTS WORKING TOGETHER

In conclusion, the concepts can be more than separate products. Different people have different sources for the emergence of their panic attacks, different triggers and different symptoms and experiences. Depending on what they find most difficult, the concepts can fit differently. For a person who has problems with feeling safe and secure, the comforting hand can be useful, whereas focusing on the rough stone instead can help a person whose problem is that they search for symptoms.

In addition, the concepts can be used in combination if a person feels to need for help with different issues. As expert 2, psychotherapist and physiotherapist, mentioned, normalising the panic attacks in order to not work up fear for the panic, which can induce new attacks, is important. Therefore, the user should also use the object outside of the attack, to be familiarised with it. By for example using the distracting stone for meditation in a non-panic situation can help the person feel better overall, lowering the stress level and in that way reduce the risk of panic attacks. By getting used to the object in a meditation setting, the threshold for using it for mindfulness in a panic attack is also lowered, which is important as it might be difficult to start thinking about mindfulness in a full-blown panic situation.



Figures 18.9 and 18.10: Other illustrations of the externalisation product.

18.2 PERSONA STORIES

The personas encountered in *Chapter 10: The faces and phases of panic attacks* are revisited in the following section in which they are helped by the concepts in different ways. The persona stories serve to show how the concepts are intended to be used from a product user journey point of view, from the first encounter to how they are used in a panic attack situation.

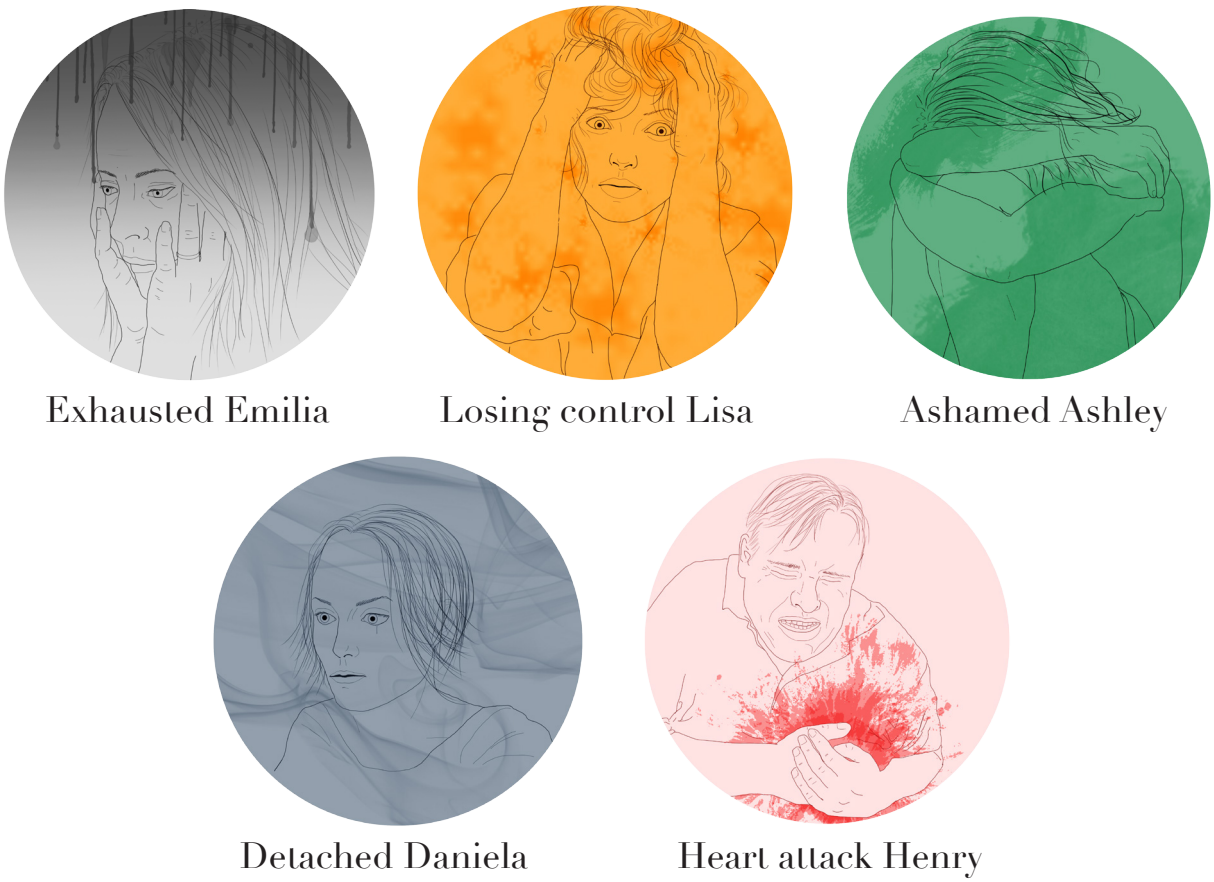


Figure 18.11: The personas from Chapter 10: The faces and phases of panic attacks; Exhausted Emilia, Losing control Lisa, Ashamed Ashley, Detached Daniela and Heart attack Henry.

HEART ATTACK HENRY

At this point Henry's avoidant behaviour has started to take its toll on his job. Henry is so afraid of getting more panic attacks that he has invented reasons for not going to meetings for several weeks. At first it was scary to go back to the meeting room to present, but by now he is afraid of going near the room. As soon as he gets closer his heart starts racing and sometimes it develops into a panic attack and other times, he can calm himself down in his office, but the rest of the day is ruined. Henry has screened off his colleagues and has not shared his experience with his wife.

One day Henry's boss, John, calls him into his office and asks Henry if something is bothering him, but Henry does not share his experiences. John says that Henry is a valuable co-worker and that he appreciates all the hard work Henry has put into the company the last few years but that he can notice that something is bothering him. Henry tries to brush off John's comment by saying that nothing is going on; he just has a lot to do. John continues:

"You are very valuable to us, Henry, but you haven't been to the weekly meetings the last month and others are asking what is going on. I need to know what's going on or we need to rethink your future here."

Henry feels as if he was washed over by a cold shower, what if he loses his job?! Then he would lose everything. At the same time he is exhausted from the last few weeks.

"How are you feeling Henry? Please talk to me, I can see that something is bothering you."

At this point Henry feels like he has nothing left to lose and he exhales and starts telling John about what he has gone through, he talks about first panic attack and how it has scared him and he now finds it extremely difficult to keep himself together without thinking and feeling like he will have a heart attack. John listens patiently and when Henry is done, there is a long pause. John looks down in his hands and says:

"I never thought I would talk to anyone here about this, but I know exactly what you are going through. I have had the same experience. I didn't think I would have a heart attack but felt like I was choking. I could feel like my breath was constricted and I had trouble getting air. The first attack for me came from out of the blue and then I started fearing that I would get another attack and this took over my entire life, making me feel limited and stuck."

Henry is surprised and feels liberated, it is as if he can relax for the first time in a long time. John continues by describing how he started seeing a psychologist and he worked with a method of having a stone to distract him from his symptom scare. When he exposed himself to a situation where he knew he might feel scared, he carried the stone in his hand or his

pocket and would touch the rough surface as a way of balancing the focus he had on his breathing. John encourages Henry to buy a distracting stone on the Internet and says that he does not have to worry about his job, John will help him get through this, it will be all right. Henry leaves the meeting feeling alleviated and having some hope.

Strengthened by the feeling of not being alone and by having the stone with him, Henry starts daring himself to go to situations he that scared him before. He chooses to take the stairs and when he feels the heart racing, he touches the stone with his fingers and tries to focus on the feeling in his hands. He tells himself that he does not have to worry; he will not have a heart attack or a panic attack. *"Just focus on the how the stone feels. It will be alright, just touch the stone."* Henry follows the stones shape like a mantra, he holds it in his hand and circulates it with his thumb. *"The stone is rough and I can feel the edge of the stone."* Henry manages to take the stairs with the stone in his hand. He still felt his heart racing and he was still scared of having a panic attack, but now he could balance the overwhelming feeling with thinking and touching the stone. Encouraged by the success, Henry keeps practicing using the stone to distract from the symptom scare and eventually dares to go to a meeting again, having his hand around the stone in his pocket. Henry visits his boss again.

"Thank you for your help. The stone has not freed me from my panic attacks, but it has helped trust that I can handle them."

As Henry is about to leave John's office, he takes one last look and sees that as John sits by his computer, he has his left hand on the table and Henry sees a glimpse of a distracting stone in John's hand.

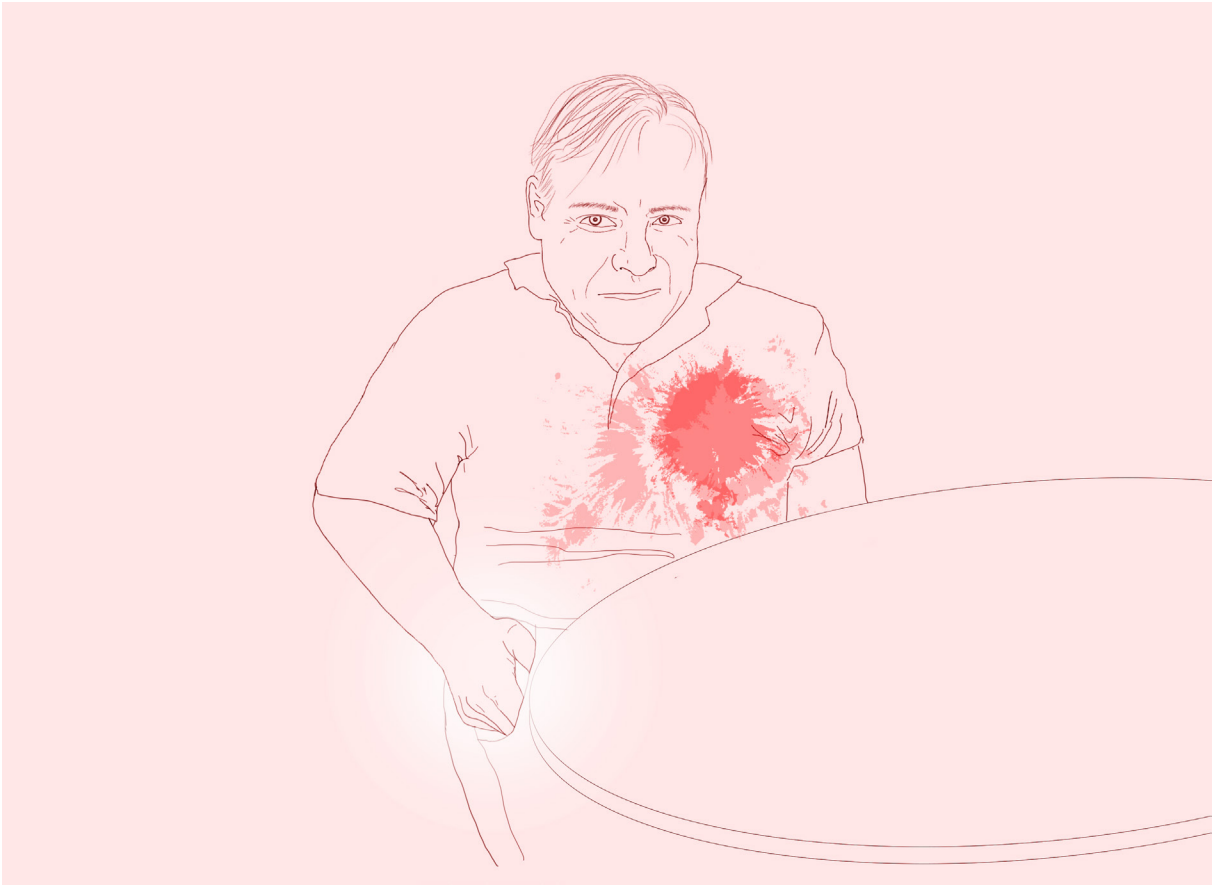


Figure 18.12: Heart attack Henry with the distracting stone.

LOSING CONTROL LISA

Lisa's husband Eric is going away for a week on a business trip and Lisa has been worried about him leaving for a long time, ever since he started talking about it. To Lisa just thinking about him being away for so long is excruciating. She fears that she will not be able to be by herself without him at home. She is so used to being able to handle things when he is with her, and she feels secure with him. When he is with her, she knows things will be better even if something bad happens. He is a safe and secure armour against the world. Now she will have to put on her own armour, and she is not certain that she can.

The days leading up to Eric's departure are painful for Lisa, she can imagine so many scenarios in which things will go bad when he is gone. The day before he leaves, Eric hands her a gift. Lisa is sceptical as she is worried about his time away but she opens the present. The first thing that strikes her is the smell, she can smell Eric's perfume as she unwrapped it. The object inside looks like a glove filled with something. She picks it up and to her it is a bit strange. She likes that it smells like Eric but she finds the object looking weird. She does like how slowly the liquid inside moves and she squeezes it lightly. Eric takes her hands in his hands and puts the fingers of the glove between her fingers. He closes her hand around the glove and puts her other hand on top. Standing there, holding her hands with the object inside, he looks her in the eyes and says that he knows that it is difficult for her that he is leaving and that he wished that he did not have to go. He tells her that he bought this thing as a reminder of him, he has sprayed his perfume on it and she can just pick up the object and hold it in her hands if she misses Eric. He says that it is a product designed to help against panic attacks and that he knows that it is important for her to talk to him when her panic comes but that it will be impossible when he is away, so if she is feeling bad when he is away, she can remind herself of his presence with the object. Lisa is sceptical, because she knows that nothing can fill Eric's place, but she appreciates that he sees her struggle and that he does what he can to help her.

The morning after Eric has left, Lisa immediately knows it is a bad day. She is feeling shaky and knows that she needs to take care of herself in order to not get a panic attack. After managing to eat breakfast and getting ready, Lisa breaks down. At the first instance, she thinks she can handle the attack and that it does not have to be so bad, but immediately after a doubtful thought strikes her and she starts falling into the panic and it is particularly bad. She is desperate to get into contact with Eric, but she knows that he is on his flight and there is no way of contacting him. The panic is raging inside her, she is trembling and hyperventilating and her heart I racing. At first she experiences hot flashes and then chills and just as the panic eases so she get an

inkling of hope that she is past it, a new attack starts and she is just as far down in the panic. The feeling of everything being unreal takes over and she feels dizzy. Once again, the panic starts to ebb and this time she remembers the object Eric gave her, she reaches out and the whiff of his perfume reminds her of the world that exists outside the panic where she is not by herself and things do not feel unreal. She squeezes the glove and puts the fingers between her fingers. Having something safe to hold on to that smells of Eric helps her calm down, just a little bit, just so little that she can regain some focus and feeling of reality. The panic keeps raging back and forth, but eventually it subsides. Lisa is exhausted and feels empty. She is still holding on to the hand and the smell of Eric helps her manage that he is gone. She finds the slow liquid soothing and she appreciates the sensation of having something between her fingers, it makes her feel safe and secure. Lisa just lies there, resting for a while, she is completely drained of energy and the hand makes her think that it will be all right, she is by herself but she managed. She feels empty, but a very small and distant part of herself is satisfied with herself and she manages to whisper:
"I did it."

Figure 18.13: Losing control Lisa with the comforting hand.

ASHAMED ASHLEY

The doctor Ashley met referred her to a psychologist and at first she found it incredibly difficult to talk about how she was feeling. The words got stuck in her throat and she was afraid that if she started talking, the therapist would get to know what a freak she was. There must be something wrong with her since she feels like she is going to pee her pants. She was deeply ashamed of what was happening to her and if she started talking, she would not be able to stop and everyone would find out what a failure she was. When she had visited the doctor who asked her about how she was feeling, really feeling, she felt as though someone finally saw her and listened and she thought that she would be able to talk to someone else, but as she got to the psychologist the first time it was as if she was mute. Somehow she did manage school and life, even if it was difficult but she felt like if she let down her guard, she would not be able to keep it together. Gradually, after seeing the therapist for a couple of times, she managed to start talking to her. Ashley could explain how difficult she found her life and how she really tried to live up to all of the expectations but that she barely managed. The therapist kept talking about how harsh her internal dialogue was and that she needed to show more compassion towards herself, but she did not fully understand what she meant - how was her inner dialogue different from other people? The therapist suggested a product that Ashley could bring with her in the situations she felt were difficult. The product was a little thing that almost looked like a baby bird with its wings closed around its body, and the therapist said that this would help her become more accepting of herself. This sounded weird to Ashley, but the therapist continued to explain how it works.

"Imagine the bird being a reflection of you. If you feel stressed, scared and tense, the bird is also stressed, scared and tense and it hides itself with its wings. If the bird was your friend, you would comfort it, right? You would be kind to the bird, patting its back and reassure her of that you love her, even though she is scared. You would encourage the bird to open up and show who she is, and tell her that she should not care about what other people think of her."

Ashley agreed that she would comfort a friend like that, but she did not quite understand what that had to do with anything. The therapist continued explaining:

"Remember, the bird is a reflection of yourself, if you are able to comfort the bird, you can comfort yourself. The bird is there to help you get a distance from your inner dialogue and discover that you would never say those mean things to someone else but yourself. Instead, talk to the bird, and to yourself, as you would talk to a friend. When you feel better, the bird feels better, and when you start to open up and accept yourself, you can do the same with the bird, and spread its wings. In that way the bird can help you see yourself and accept the state that you are in, scared and stressed or relaxed and free."

Ashley is doubtful that anything could help her, but she brings the product in her bag to school. Ashley feels stressed going to the lecture, she knows it is a difficult situation for her and she gets anxious before going there. She

cannot help herself thinking that she would need to visit the toilet before the class starts, but she is running late and there is no time. She enters the big lecture hall and takes a seat. She tries to relax and focus on the teacher, and during the first 15 minutes she actually feels all right. But as the lecture goes on, the feeling of needing to go to the bathroom starts to grow, and her thoughts starts spinning. She feel as if her bladder is about to burst and she starts imagining the worst case scenario - her peeing her pants in front of the whole class. At the same time as her desire is to run as fast as she can, out from the lecture hall, and into the toilet, the shame of leaving the classroom, again, is keeping her in her seat. Her feelings are all over the place, and the shame is consuming her.

She remembers that she brought the thing her therapist gave her, and she thinks that maybe she should give it a try. Apparently it should be able to help her. But what if someone sees her with the product? What are they going to think? She must come up with an excuse before she takes it up from the bag. Maybe she could discard it as a silly stuffed animal that she got from her sister that is nice to fiddle with? The panic is increasing and she decides to give the product a try. She takes it up from the bag and starts to stroke the surface of the product with nervous hands. She does not feel better, and she gets even more stressed out. Maybe she is so screwed up that nothing can help her? She remembers the words of the psychologist *"If the bird was your friend, you would comfort it, right?"* She thinks it sounds silly, but she starts to talk to the animal with her inner voice, saying, *"It is okay to be scared"*. She tries to say the same thing to herself, and in a weird way she thinks that it was easier talking to herself through the animal. She continues with saying to the bird, and herself *"I would not think differently of you if you left the lecture hall, you are not a freak"*. Ashley feels a bit more relaxed, if she really needs to go to the bathroom she could leave. She opens up the wings of the bird a little bit, revealing the soft stomach. She strikes her fingers over the soft belly and thinks, *"I have a soft inside too, maybe I am not all weird."* She starts to listen to the lecture again, but soon the anxiety returns. *"Who am I fooling? Everyone would look at me if I left the room, they would think that I am a freak that can't even hold it in for an hour!"* She takes up the bird again, closing its wings, and tears are starting to build up. Again she tries comforting the bird, and herself, and all of a sudden, the people around her start to rise from their seats. She realizes that the lecture is over. She had made it through without leaving the classroom and without peeing her pants. She is so relieved. Ashley squeezes the little birdie and whispers, *"I'm so proud of you"*.

Figure 18.14: Ashamed Ashley with the little birdie.

DETACHED DANIELA

To Daniela the distracting stone was helpful as she gets overwhelmed by the feeling of not being in the present, being detached from reality and her solution to this has previously been destructive - hurting herself. She needs to feel something intensely.

The first time she used the stone, she had a particularly bad panic attack and she was lucky to have the stone beside her. In a moment of clarity, she remembered the stone and grabbed it. She enclosed it in her hands and grabbed on tightly. Daniela could feel the hard edges against the palm of her hands and the sensation was familiar to sensations in the real world, the non-panic world. As the panic wave increased, she squeezed the stone as hard as she could and the feeling in her hand was intense. It was not as overpowering as when she hurt herself, but it was there to balance the panic wave. It was something to remind her of the real world that existed outside the panic.

Daniela likes the ancient, everlasting symbol that the stone is. She likes that it represents something bigger than herself, something that puts her panic attack into perspective. She feels like she can hold on to and rely on the stone.

It was her psychiatrist who mentioned that she might be helped from a distracting stone. They talked about her self-destructive behaviour and Daniela mentioned that her thoughts had been wandering in the direction of hurting herself as she her mental health had been worse lately. Her psychiatrist saw her need of a powerful sensation that was not self-destructive during her panic attacks so she can get out of feeling like everything is unreal and he suggested a product for it. Daniela is open to trying things to help her, but she knows from experience that it can be difficult. Even though she did not quite believed that a simple stone could actually do something for her at first, she is glad that she tried it.

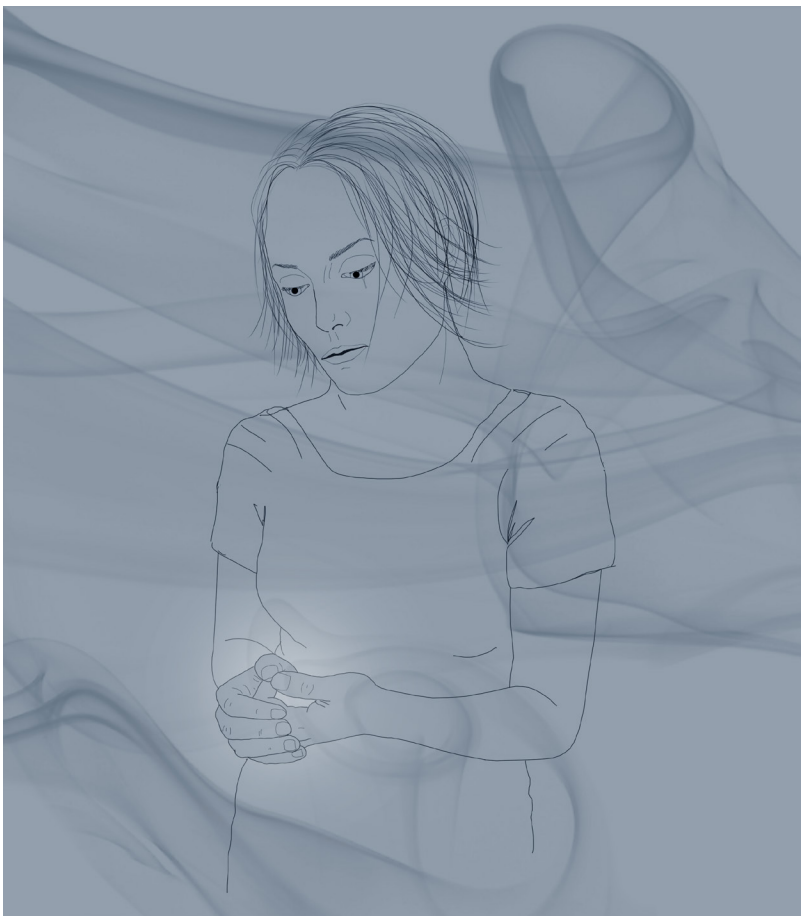


Figure 18.15: Detached Daniela with the distracting stone.

EXHAUSTED EMILIA

Even though Emilia would prefer to live completely without her panic attacks as she did before her breakdown, she knows that it is impossible to go back. The way she lived was not sustainable, she was trying to live up to too high standards and she did not even realise that it was too much, she just thought that was the way life was and if she wanted the career, the family and the great house, she just had to grit her teeth and work hard. People told her it was too much, but it was almost as if she had to go through what happened in order to get the message through. Emilia learnt a tremendous amount about herself and now she is not as hard on herself as she used to be. She needed therapy and went to a psychologist regularly in the beginning, but now she knows that she must take care of herself in order to minimise the panic attacks.

When Emilia visited a mindfulness website, she found a link to a company making distracting stones that is supposed to be used to practice mindfulness and refocus during a panic attack. Emilia bought a stone as it reminded her of a great experience during a vacation to Greece. She was the only one being awake in her family one early morning and she snuck out to the beach. She sat down in the lotus position and picked up a beautiful stone from the beach. She was all alone in the early morning sunshine with the beautiful stone, still a bit cold, in her hand and did her morning yoga. It was a fantastic memory of experiencing the present. Emilia had never considered using such an experience against her panic attacks before, but the simplicity of the idea thrilled her. When the stones arrived in the post, she immediately liked the roughness of the texture, the size was perfect for her hand, the weight and how there was a smooth surface that her thumb could caress. Emilia started using the stone when she practiced mindfulness. She had always found mindfulness difficult to do by herself. When going to a lecture with a leader talking through the steps of mindfulness, she could focus on how the chair felt under her legs and she could focus on the soft breeze against her cheek, but whenever she had to do it by herself, she found it difficult. She could never focus long enough and it was as if the impressions were not strong enough. The stone, in its simplicity, helped her to find somewhere to focus. At first she could focus on touching the rough surface and when squeezing the stone, she could appreciate the almost sharp edges in her hand. As she kept using the stone, she started appreciating the weight of the stone and how it turns from being cold to being warmer from the heat of her hand.

Emilia read that the stone should be used to refocus in a panic attack and the first time she was comforted by having something reliable and tough to squeeze hard and hold on to, she could use all the force she had as her body tensed and the stone did not buckle, it remained exactly the same during and after the attack as it was before. The next time she

had an attack, she started trying to focus on the stone and not just the panic. She stroke the rough surface and just for a millisecond it did help her focus on the surface instead of the racing heartbeat and trembling. She kept using the stone for her mindfulness practice and she noticed that as she practiced being in the present, it helped her from focusing on her panic and worry, which kept the attacks away.

On the same website she found the distracting stone, Emilia also found a comforting hand to be used for the later stages of the panic attack, when it was time to recover. Emilia knew she always felt extremely tired after a panic attack, it could feel as though she had run a marathon. To Emilia, the hand offered some well needed comfort, something to hold on to when the panic was ebbing out and something that made her feel more OK with herself, holding a hand between her fingers made her think that maybe she is not so bad after all, and maybe it will be alright. Maybe the overwhelming feeling that something will go wrong was not true. The comforting hand helped Emilia to recover faster after a panic attack, as she could be kinder to herself.

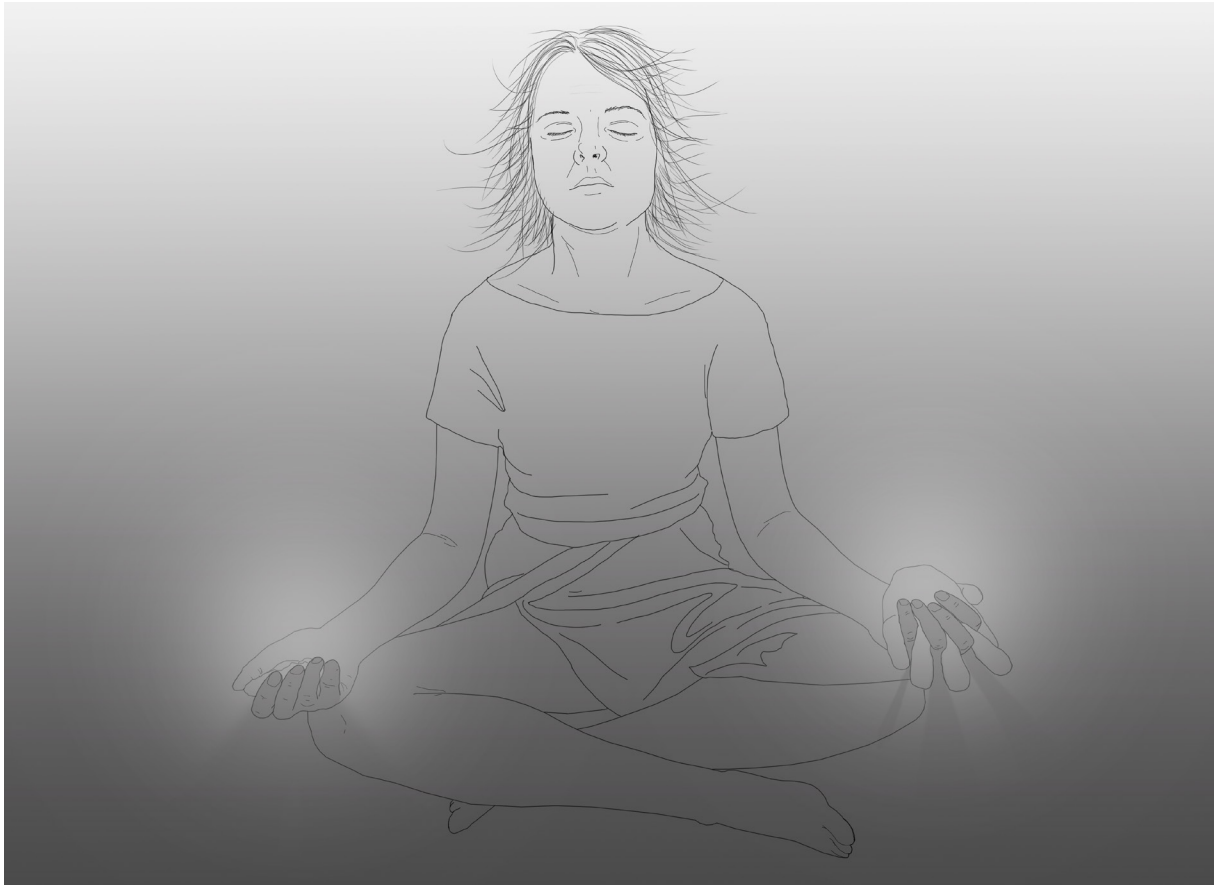


Figure 18.16: Exhausted Emilia meditating with the distracting stone and the comforting hand.

18.3 CONCLUSION

The conclusion of this chapter is a description of how the concepts fulfil the general needs.

- *Need: The product should help the user to let in the present, being consciously aware of what is happening in this very moment. That is, the product should assist the user in being mindful, thus, focusing on what is happening in the moment rather than on the bodily reactions and catastrophic thoughts.*

Fulfilment: All concepts offer the user something in the outside world to focus on.

- *Need: The product must not extinguish the inner dialogue and exclude the panic attack, but coexist with it, giving space for reality but also reflection upon thoughts and symptoms. This is to make the person normalise their panic attack and to not create a safety behaviour or object.*

Fulfilment: There is no indication on that any of the concepts gives an input strong enough to exclude a panic attack or extinguish the inner dialogue. Furthermore, the birdie is assisting the user in normalising his or her state of mind.

- *Need: The product should not create a dependency on it for the user in a long-term perspective, but instead teach the user how to handle their panic attacks without the product.*

Fulfilment: All concepts aim to teach the user how to manage their panic attacks without the product.

- *Need: The product should offer a snap out effect, helping the user connect with the reality and refocus, as well as offering a calm down effect and a sense of not being alone, helping the user to calm down and feel better about themselves.*

Fulfilment: The stone offers the user a strong input, helping them to *snap out* of the panic attack. The comforting hand and little birdie also help the user with connecting with reality and refocus, although not in the same *snap out* fashion as the distracting stone. All concepts help the user calm down, and the hand gives the user a sense of not being alone.

- *Need 5: The product should have a shape, size and weight that facilitate the device being carried in a pocket, purse or briefcase.*

Fulfilment: All products have a shape and size facilitating the device being carried in a pocket, purse or briefcase.

- *Need: The product should empower the user in order for them to feel that they regain control in the panic attack.*

Fulfilment: All products are giving the user an active role in the use phase, making them empowered. In addition, the all concepts help the user help themselves in different ways, which is empowering.

- *Need: The product should be able to withstand the handling of a person in a panic attack state of mind. This could include not being able to see properly and dropping the product, or not being fully aware of how hard one is squeezing with their hands.*

Fulfilment: The construction of the products is yet to be determined. However, there is nothing indicating that the products must be constructed in a way that makes them sensitive to drops or squeezing.

In conclusion, the needs stated earlier in the thesis have been fulfilled by the concepts developed. The concepts fulfill them in different ways and they provide a range of products that may be suitable for different individuals.

END OF PART 2

Concept development

19. DISCUSSION

In this chapter, the result of the project is discussed on the basis of fulfilment of aim and goals, the influence of the chosen project approach, the lessons that we have learned from working with the project and the reliability and validity of the results.

19.1 FULFILMENT OF AIM AND GOALS

The aim and goals set in the beginning of the project:

"The aim is to investigate the possibilities for productification in the area of panic attacks. Furthermore, the aim is to develop a product or products, i.e. not a medicine or a therapy method that can help persons suffering from panic attacks and panic disorder."

and

"The goal is to, within the frames of this master's thesis, develop one or more product concept(s) that can work against panic attacks. The product(s) should make the panic attacks less difficult for the user and/or help alleviate the user from the panic attack and should be focused on the core issues of panic attacks."

were fairly straightforward. A problem was to be investigated and a solution was to be found, and thus the mission was to conduct a standard procedure product development project.

However, the nature of this problem was very different from what we as designers are used to. The task in this project was not to find a product solution that relieves the user from a physically straining task, or to increase the usability in a product. Instead this project was focused on solving a problem in the mind of the users and to help them think differently. Thus, the otherwise straightforward aim and goals turned complex. How can one investigate and measure the problem, and how on earth could one come up with any solutions?

The answer to these questions was to use the same design methodology and process used in other product development projects, which is further discussed later in this section.

So, the design methodology helped us in our work, but did we manage to fulfil the aim and goals?

The *possibilities for productification* in the area of panic attacks are not necessarily unambiguous. Depending on what panic attack sufferer or what expert in the area one talks to, the possibilities and limitations seen can be different. For example, some of the interviewees were sceptical towards having a product altogether, while others were positive. To complicate it further, the investigation of the productification possibilities was continuous and evolving work that did not stop at finding that there is room for a product. Instead the investigation of the productification possibilities was constantly developed alongside the design decisions. The search for productification possibilities led us to answering the question of *"What should we do?"* while the design decisions answered the question of *"How should we do it?"* and for every what there could be one or several hows and vice versa. For example:

What should we do?
We should break the internal focus!
How?
By using a sensory input!
What should the input be?
It should be a haptic input!
How should we create haptic inputs?
Using vibrations!

And so on. In every decision of *what* and *how*, our theories also had to be validated, either by testing or through dialogues with users or

experts, to avoid both giving false answers and asking the wrong question.

In many projects at least the initial *whats* are already determined. For example, the mission can be to create a new bedside table for patients that are hospitalised. In this project there was also a *what* suggested: to create a breathing device that helped the sufferers of panic attacks elevate their carbon dioxide level in their blood. Nevertheless, we decided early on to start from scratch and investigate the subject to find the *what* ourselves. This gave us a lot of freedom to steer the project in the direction that we believed in, but at the same time the search for the *what* was a hard and complicated task.

The iteration between the *whats* and *hows* was inspired by Lars-Ola Bligård's framework of the iterative nature of the product development process, which promotes a constantly evolving design work based on recurring processes of data collection, analysis, ideation, synthesis and evaluation on all of the design levels. Using this process framework enabled us to make decisions on the suitable level of detail and not spend unnecessary time on small details for higher-level decisions.

Bligård's framework with design levels and design perspectives, together with his advice made us focus on the effect level for the first part of this project, being our first *what*-question: *what effect a future product should have.* This question could be answered quite unequivocally to be to break the internal focus on thoughts and bodily symptoms, which is a problem that can trigger and maintain panic attacks. We believed that a future product that could break the internal focus could be a success.

However, the following *what*-questions were harder. When we for example were trying to investigate what type of haptic input that was the most suitable to use, the thoughts and preferences of the individual users were different. Our vision was also blurred by our own preconceptions of what a product could be and we made the what more complicated than turned out to have to be.

In these ambiguities we as designers had to take the majority opinion of the users and experts in consideration as well as our own designer's instinct. This instinct, or gut feeling, is of course not a scientific tool with high reliability and validity, but something a designer develops over time. In this project, the designer's instinct has been an invaluable tool in times of uncertainty and equivocality and thus, we believe that this project would have been impossible for us to do a couple of years ago, even if we would have had the same tools and theories at hand. A complex problem like this demands of the designer to have a confidence in her own work, as well as a bank of experiences forming a well-calibrated designer's instinct.

Finally, a very important *what* that could be questioned in terms of correctness is the very first one, i.e., the aim of finding possibilities to make a product against panic attacks. As previously mentioned, some were sceptical towards the very idea of having a product against panic attacks, and thus the *what* that started off the project might be irrelevant. If so, the whole project has no relevance. However, even though some of the interviewees were sceptical, many were positive towards the project in general and to the solutions we came up with. Therefore, we believe that the product development project itself is of value.

Now, back to the core question, did we fulfil the aim of *"investigating the possibilities for productification in the area of panic attacks and to develop a product or products, i.e. not a medicine or a therapy method that can help persons suffering from panic attacks and panic disorder?"* Well, we believe that we managed to investigate the possibilities for productification by conducting a thorough research study, and listening to the sufferers and experts as well as to our own designer's instinct. The response from the users has also been positive which indicate that we have managed to find relevant productification possibilities. This also implies that we have managed to create the prerequisites necessary for achieving the goal of creating a product that

is focused on the core issues of panic attacks, and not just the symptoms.

In addition, the concepts are not medicines or new therapies, but one can discuss the concepts' relationship to therapies. In the aim, it is stated that the result of this project should not be a therapy, but a physical product. In the end, the result was physical products that in different ways facilitate the use of already existing therapies. Thus, we have not invented new therapy methods, but we have made ideas and therapies that are already used more approachable and easier to use.

Although we believe that we have fulfilled the aim, the problem is very complex, and there are many possibilities for productification, most likely many more than those that we have found. Thus, we believe that we have done a good investigation of the productification possibilities, though we cannot state that we have found *the only* possibilities for productification.

So, we managed to do an investigation of the possibilities for productification, but what about the aim and goals of *designing a product or products against the core issues of panic attacks?*

The success of the design of the product, and thus *how* the product should fulfil the *what*, was of course very much dependent on the result of the investigation of productification possibilities. Similar to reaching the aim of finding productification possibilities, the path to reach the aim and goals of designing a product was not straight. In order for us to achieve the task we had to shift our mind-set from designing a product to designing an experience. We realised that the value of the product should not be the product itself, but what happens in the user's mind when they are using it. After going astray many times in trying to design a complex, multifunctional "flashy" product, we gained a greater understanding that that was not the function this particular product should have, instead of having the action taking place in the product, the focus should be shifted to the user and the function of the product was to enable action to take place in the mind of the user. Through extensive user testing these errors were identified and we could peel off layer-by-layer of complexity until we ended up with three, on the outside, very simple product concepts. A problem in the design development was however to test whether or not our *how* was accurate. The *what* could be discussed with persons suffering from panic attacks and experts in the area. The *how* on the other hand, was largely dependent on the execution of the models that we made, and since some of the models had a poor finish, it was impossible to determine if the design actually fulfilled the goal. Thus, we cannot know for certain if the product concepts make panic attacks less difficult to handle or if they alleviate the users from their panic attacks.

Nevertheless, by creating concepts that we and many users and experts believe to achieve the right thing in the right way, we believe that we met the aim and goals of designing a product or products that work against panic attacks. However, similar to the possibilities for productification, we do not believe that we have found *the only* three ways of making products against panic attacks. There are probably many other ways that one can solve the issue, even if the initial presumption is that the problem should be solved by breaking the internal focus. A more experienced designer with a more acute designer's instinct might have tackled the issue with a different result, and other users and experts interviewed would probably also have enabled a different result to be reached.

All in all, we are happy with how our result has corresponded to the aim and goals that were set in the beginning of the project. We have investigated the possibilities for productification, and we believe that we have designed products, not a medicine or therapy method, that can help persons suffering from panic attacks and panic disorder, by making the panic attacks less difficult for the user and that help alleviate the user from the panic attack by focusing on the core issues of panic attacks.

The question that does remain is whether or not a *product* against panic attacks

is the right way to go. There is a risk that a product creates a safety behaviour instead of helping the person and maybe the products that we have designed have no effect. The only way to find this out is to make a full-scale test with well-made models, used in a panic attack situation. This could have been possible to achieve within the frame of this master's thesis. This is why we decided to put more focus on investigating the *what* compared to designing the *how*, as having the right basis of what the actual possibilities for productification were would increase the likelihood of making appropriate subsequent designs. Had we made a different prioritisation, focusing more on the execution of, for example just one of the final concepts instead of trying to "fill the void" with new concepts we mention in *Chapter 16: Filling the void*, we could have ended up with a more decisive result on whether or not we have reached our goals. Despite this, we do believe we made the right decision in having a wider focus as and that the strength of this thesis is the thorough investigation of the productification possibilities. This approach has given us the possibility to dig deep into the subject and allowed us to make a range of concepts tackling different aspects of panic attacks, showing that *one size does not fit all,* which was an important result of this thesis and a lesson learned on how to design products to help with mental health issues in the future.

19.2 FIGHTING PANIC ATTACKS BY USING A PRODUCT DEVELOPMENT APPROACH

We believe that using a product development approach to tackle this complex and personal problem has widened both the problem and solution space of how to deal with panic attacks.

By using a designer's way of approaching the problem, we were not limited to any medical categorisations and instead we were able to look at the issue from many points of views without preconceived notions. The interviewees were able to talk about their problems without us judging them on the basis of what condition they may or may not have, and thus the problem space could be explored in more depth. In addition, the interviewees seemed to appreciate providing us with information on their experiences, especially on what they do against their panic attacks, giving the interviews a positive and hopeful tone of at times. Furthermore, the product development tools helped the interviewees concretise their feelings and emotions. For example, the user journey (panic attack cycle) helped them visualise how they actually feel during a panic attack, making them reflect upon the different stages of the panic attack, and what feelings and symptoms that occur in what point in time.

The designer's approach also provided new ways of solving the issue. The existing methods for treating panic attacks are either based on affecting the signal substances in the brain by using medications, or affecting the way people think and act by using therapy methods. With the designer's approach we were able to assist the user in thinking and acting differently by providing them with a concrete tool. Furthermore, the product development perspective enabled us to also design the relationship between the product and the user, which is not considered in the current treatment methods.

In conclusion, the product development approach offered tools for concretising both the thoughts and feelings of the persons suffering from panic attacks, as well as the methods for dealing with the panic attack. Thus, the product development approach helped turn very abstract problems and abstract solutions to the problems, into a more concrete form that might be easier for a person to embrace. Furthermore, the product development approach and the designer's way of thinking, enabled us to fulfil the aim and goals of the project, i.e., to investigate the possibilities for productification and to develop products that can help a person with panic attacks that are not medicines or therapy methods, and that focuses on the core issues of panic attacks. If a product

development approach was not used, and if the problems connected to panic attacks, the people suffering from panic attacks, and the context in which they occur, were not thoroughly investigated, we believe that the result would have been very different. If for example the project would have been carried out with a medical approach, we believe that the result would probably be focused on managing symptoms, or replacing a medicine with a physical product with the same effect. This medical approach was present in the beginning of the project when we were given the project by the Center For Technology in Medicine and Health (CTMH). They, as previously mentioned, suggested that we should make a product that recirculates exhaled air to elevate the carbon dioxide levels in the blood of the panic attack sufferer. However, with a thorough design process and a focus on the *what*, we believe that such a product would not attack the core issues of panic attacks. Furthermore, our understanding for the user and the context later provided further arguments against a breathing device. Many users feel ashamed over their panic attacks, and many experience panic attacks in public settings. Thus, a highly visible product that you use in close proximity to the face is probably not preferable.

19.3 WHAT HAVE WE LEARNED?

As mentioned previously, this project has been quite different from many others we have conducted both in terms of the subject, mental health issues, and in terms of the fact that no product exists today as a starting point for the development process. This demanded other skills from us as designers than we were used to and we learned a tremendous amount. We will share some of the lessons we learned from carrying out this project in the following section.

EMPATHIC DESIGN

User-centred design is sometimes called empathic design since it considers the person who will use the product from the starting point, and creates a product around this. Showing empathy to oneself turned out to be one of our final concepts but it has also been a way of working for us during the project. As mentioned in *Chapter 9: Shame and vulnerability,* Brené Brown mentions four attributes of empathy including being able to take the perspective of the other person, recognising emotions in others by being in touch with one's own emotions and being non judgemental. We used all of these in this project. We listened a lot to the individuals who bravely shared their sufferings with us and we tried to connect it to our own emotions, which was at times painful. In this process we also learned a lot about ourselves and each other and we created a space where we could share thoughts and feelings so to understand ourselves and in that way understand the subject of mental health better. In order to truly understand the subject we had to get personal, in a very non-judgemental way, which also enabled us to try unconventional solutions and materials, opening up for creativity.

KILL YOUR DARLINGS

Throughout the project we had to question the ideas and solutions we created, as we learned more about panic attacks. One clear example of this is when we gave up a movements and vibrations, mentioned in *Chapter 15: Exploration of haptics test*. We really believed in have a multifunctional product that would give a range of haptic inputs, such as vibrations, different temperatures and movements, but tests with blindfolded participants clearly showed that it can be very uncomfortable with products that change outside of one's control. This was an important realisation for us as we thought that a product against something so powerful as a panic attack had to be powerful itself. We were surprised by the fact that something much more simple and calm was "strong enough". We had to be willing to let go of ideas we were

fond of, which is important in developing a product where no product exists. Had we not been willing to kill our darlings when it came to ideas and solutions, then we might have created a product that was counterproductive in a panic attack.

FIND A POSITIVE COUNTERWEIGHT

One can easily be downhearted when working with mental health issues that are difficult to solve, which happened to us, especially during interviews where the personal suffering of the interviewee was evident and we felt incapable of helping the person. Two things helped us to not stay downhearted: the appreciation we got from the participants in our study concerning that we wanted to take on the subject, as well as when we found our researcher hero, Brené Brown and her research on vulnerability. In the midst of investigating the crippling effect panic attacks can have on a person's life, Brown's inspirational research on how to live wholeheartedly counterweighted the helpless feeling. Instead of helpless we felt hopeful. This was a way for us to see solutions instead of only the problems. Brown painted a wonderful picture of how it is to live wholeheartedly and based on this we tried to think of how we could design for this. It is important to focus on a positive future solution and not on only the issues. In other projects where the subject matter is not mental health issues, it can still be easy to lose hope when the solution to the problem is seemingly impossible, so having an inspiration to glance at can be helpful.

19.4 VALIDITY AND RELIABILITY

In this section, the validity and reliability of the result is discussed, both in terms of the reliability and validity of the project as a whole, as well as the validity and reliability of the specific choices we have made.

VALIDITY AND RELIABILITY OF THE PROJECT AS A WHOLE

The project aimed to help persons with panic attacks, which includes all people around the world suffering from panic attacks. However, in this project only individuals in Sweden were interviewed, thus the validity of the result could be questioned. Furthermore, throughout the process, no tests were made with people who were actually having a panic attack in the moment of testing. Thus, the validity of the tests can be seen as low. In order to counteract this fact, the persons with panic attack experience were asked to give feedback on the concepts based on how they thought that they would work in a panic attack situation.

The sample selected in the interviews contained a mix of people suffering from panic attacks caused by panic disorder as well as other anxiety disorders, such as agoraphobia and GAD. This could have caused a validity issue if this project aimed to help only those suffering from panic disorder. However, since this project is aiming to help all people suffering from panic attacks, independent of the panic attack's origin, we do not believe that this is posing a validity issue.

Finally, this project breaks new ground in the area of product development as a way of helping persons suffering from psychological issues. Thus, existing theories and methods on the area are very scarce. This has resulted in a very explorative approach to the work, testing hypotheses in many small steps and developing the concepts continuously. This explorative approach might have resulted in making our ideas and preconceptions of the problems, and the solutions to the problems, more pronounced. Thus raising questions regarding bias. Furthermore, due to the lack of existing publications on the area of product development and psychological conditions, it is impossible to determine the validity of the results.

VALIDITY AND RELIABILITY OF PART 1: FRAMING THE PROBLEM

The first part of the project which focused on *what* to do, including searching for information on panic attacks from literature, experts and the experience of individuals, as well as analysing it with regards to where (or even if) we could contribute with our product development expertise. The results of this is discussed on the basis of validity, reliability, sources of errors and the fulfilment of the aim and goals in this section.

LITERATURE STUDY

The literature used in this project was a selection of the vast material on mental health that is published. Thus, some aspects of panic attacks featured in medical and popular literature was probably neglected. However, the literature used had both the perspective of the medical professionals (Semple and Smyth, 2013) and the persons suffering from panic attacks (Carlbring and Hanell, 2011) thus providing a broad spectrum of points of views.

QUESTIONNAIRE SURVEY

The questionnaire survey conducted was distributed online and within two closed groups, which probably affected the result. Only persons on the Ångestsyndromsällskapet's e-mailing list and persons within the reach of our (the authors') Facebook profiles were able to conduct the survey. Thus, persons without access to the Internet and persons that were not in direct contact with us or Ångestsyndromsällskapet were not able to give a response to the survey. This, we believe, resulted in many young persons responding to the survey since they are the ones within the reach of our Facebook profiles, and many persons with more serious issues since those are more likely to be involved in Ångestsyndromsällskapet's activities, answered the survey.

Furthermore, since the survey was not mandatory to complete, the ones answering it might be more prone and willing to reach out and talk about this issue. However, although there are a lot of sources of reliability and validity problems in the sample, the ones answering the survey fit fairly well with the description of those suffering from panic attacks found in literature. There were many women, and many people in the age span of 18 to 25.

INTERVIEWS WITH PERSONS SUFFERING FROM PANIC ATTACKS

Since the interviewees were found via the survey, the sample issues in the interviews were similar. However, the interviewees' proneness to share their stories might be more profound in the interview sample than the survey since it was optional to fill in the contact details in the survey in order for us to contact the participants again. Thus, persons who feel a lot of shame about their condition might not have been reached in the interview study, making the result skewed.

INTERVIEWS WITH EXPERTS

The experts that we reached out to had mainly been recommended to us via Ångestsyndromsällskapet. Thus the sample of experts might have been influenced by Ångestsyndromsällskapet's opinions and points of view. If other experts had been interviewed we might have gotten another view of panic attacks and how to stop them. However, the statements made by the experts did in a great extent correspond with the literature reviewed, thus we do not believe that the information received from the experts differs majorly from the recognised view of the topic. In addition, the experts gave different opinions based on their areas of expertise and points of view, suggesting that a spread of expert knowledge was found.

OTHER EXPERT INPUT

The other experts' views considered in this project were found via the Internet. There is a lot of input that can be found on the Internet with varying credibility. However, the persons we have listened to are respected scientist in their respective fields and therefore we feel

confident that the information that they have shared is reliable.

VALIDITY AND RELIABILITY OF PART 2: CONCEPT DEVELOPMENT

As mentioned, the first part of the project focused on what to do, and consequently, the second part focused on how to do it. In order to investigate how to develop products against panic attacks, an explorative approach was used and each chapter in the *Part 2: Concept development* were set up as its own investigation and forms a small report each, therefore, investigating the validity, reliability and sources of errors are relevant to do for each chapter. Finally, the following section also contains the fulfilment of the aim and goals.

CHAPTER 13: EXPLORATION OF THE SENSES

A big validity issue with the exploration of senses study is the question of whether or not pain can be used as an analogue for panic attacks. On the one hand, the pain is similar to a panic attack since it is a bodily sensation that steals a lot of focus. On the other hand, the pain does not include the components of fear, catastrophic thinking, losing touch of reality, embarrassment and powerlessness that a panic attack includes. Thus, the test did not evaluate whether or not the inputs could make those feelings go away or become easier to handle. Furthermore, the pain remains as long as the clip is on the ear and even though the pain could be extinguished for a moment by eating a lemon, we were not able to test if the momentary relief of pain could remove the pain permanently. In a real panic attack the symptoms are ultimately caused by a psychological reaction and a break of the vicious circle of internal focus might very well be enough to end the panic attack. Thus, eating a lemon or a chilli might be a good way of managing the panic attack. After all, the lemon is used in the healthcare system. However, this probably does not help one to get rid of the panic disorder since the lemon is a quick fix that does not help the users process their thoughts and problems.

Another big validity issue is that we did the test on ourselves. Thus, our thoughts and feelings regarding the subject could have created biases in the result of the test. For example, we had high hopes for the vibrating input in the early stages of the project, and maybe this resulted in a too positive interpretation of the result in favour for vibration. However, as the project progressed, vibration could be eliminated from the list of a successful inputs. A more specific validity issue in the exploration of senses study concerned the test combining heat with vibrations. The test setup involved the participant holding the can with hot water at the same time as the vibrating phone was held against the can. The input was rather rough and unpolished, thus the result might have been different if the two inputs were combined more seamlessly.

The level of reliability in the study can also be discussed since the test was performed only on two persons, being we, the authors. Other persons might have reacted differently on the inputs, rating them as more or less effective as well as rating them as extinguishing or coexisting with the pain in another way. However, the fact supporting the reliability of the test setup is that the two of us rated the inputs fairly similar, thus suggesting that different persons experience the sensory inputs in a somewhat similar way. Another source of reliability errors is the pain rating. Since the participants rated the pain on a scale from "not painful at all" to "the worst pain I have ever felt" the pain rating was very subjective and dependent on what pain the person has felt in the past. However, the comparative result between the inputs is not affected by this error.

CHAPTER 14: IDEATION OF HAPTICS

In the small tests performed in the ideation of haptics section, a lot of different sensory inputs were combined in the same model. However, sensory inputs cannot be separated. It makes a large difference if you hold in something cold,

small and light, in opposite to something cold, big and heavy. Thus, it is hard to determine which properties of the test object that caused a, for example, calming effect during the test determining where on the body the product should be used. Therefore, in order to make a more valid test, the properties should have needed to be tested individually. However, since this phase was focused on exploration the result from the small test still proved to be useful.

CHAPTER 15: EXPLORATION OF HAPTICS TEST

The exploration of haptics test was performed with participants without issues with panic attack, thus the validity of the test can be questioned. Furthermore, the participants in the test were all male which also can pose validity issues since the majority of those suffering from panic attacks are female. Despite the obvious validity issues, general guidelines on how to perform a future test could be created. Moreover, the inputs regarded as uncomfortable by the participants without panic attack issues, can be assumed to also cause discomfort in people with panic attacks and thus, general guidelines on product properties could also be created.

CHAPTER 16: FILLING THE VOID

No valid conclusions can be drawn from the single participant used in this section. Thus the indications given by the participant is no guarantee for the products created in the filling the void section to be successful in a more extensive test. Moreover, the participant was not a sufferer of panic attacks, and thus, her reactions might be very different from those who have issues with panic attacks.

CHAPTER 17: HAPTIC EVALUATION TESTS

Though the haptic evaluation test was performed with people suffering from panic attacks, other validity and reliability issues could be identified.

THE POOR QUALITY OF THE MODELS

The models for the little animal concept were not executed with enough precision to get the intentions of the concept across. All participants mentioned and focused on them being afraid of damaging the models, that they would break from the pressure of them handling them, or that they themselves would get hurt from the raw and sometimes sharp edges. As the users did not see the models, they could not see that the materials would not hurt them and that they did not have to worry. The idea or principle of the concepts did not get across as the users were focused on the above-mentioned aspects rather than what we intended for them to represent, thus the validity can be questioned. The hands and stones models were more accurate so the users focused on explaining their experience concerning what was intended to be evaluated rather than the state of the model. This makes the data on the little animal concepts skewed as the focus was on the fear of breaking the models rather than the intentions of the concepts.

The little animal concept needs an explanation in order for the user to understand the intentions and function of the model to a greater degree compared to the stones and the hands. For the stones and the hands, the haptic impression in itself is the function of the product. The function of the stones is to offer a haptic impression that makes the user focus on the distraction of the rough surface and the hands' function is to offer a comforting hand holding feeling to the user's hand. To present these concepts without an explanation is relevant as the question is whether other people agree that the models offer the impressions and to evaluate with people with experience of panic attacks think the impressions could be helpful. The results for these have a higher validity with a real life situation. As for the little animal concept, on the other hand, the specific haptic impression is as important as the idea of the concept of how to work with oneself. The choice was made to present all the concepts in the same way in order to see what the result would be of the haptic experi-

ence and how much of the idea came through the model, but the validity for the little animal concept can be deemed lower as in a real life situation, this concept requires the user knowing what the purpose of the model is. This is highlighted with how the participants generally changed their impression of the concept, experiencing it as more positive, once they were told about the idea of externalisation oneself and working with empathy for oneself after the test. Many participants mentioned that they would have thought differently of the product had they know the idea behind it. Many thought the concept was very relevant but that it did not come across solely in the model.

NOT SEEING THE PRODUCTS

Not seeing the product influenced the participants in a way that could put the validity in question. When the object or haptic impression was foreign to them, such as in the gel balls hand and the gravel hand models, and they did not understand what they were experiencing and why, the impression was generally more negative. Had the participants seen the concepts, they might have experienced it as less foreign and strange. In a real life situation, the participants would know the object in advance and know what it looks like, which questions the validity of the results of the tests. The stones, on the other hand, were objects the participants identified more quickly as known objects, and they focused more on exploring the object. Once they had touched the stones they seemed to get a quicker overall impression of them and could focus on exploring them with a more positive mind-set compared to some of the stranger models. The validity is higher for an object that the participants can relate to and do not have to spend time on trying to identify and understand.

The situation of not being able to use the visual sense seemed to make the participants uneasy which may have reflected in a more negative outcome in the semantic scales than had they been more comfortable in the test situation.

THE SEMANTIC SCALES

The validity of the result of the four semantic scales presented differs. The stones and the hands are considered to have a higher level of validity compared to the little animals. During the tests it was obvious that the participants got roughly the same impressions of the different stones making it possible to combine the results into one mean value. The same goes for two comforting hands; the syrup and the gel ball hands gave roughly the same impression, respectively, making the validity of the mean value calculation high. The little animal concept on the other hand gave many different impressions, so the combination of the results into one mean value has lower validity for what the participants intended with their semantic scales. As discussed above, the impressions were so different that it was difficult to put them together in a meaningful way other than calculating the mean value.

The choice of words was also questioned by the participants as some thought it was supposed to be antonyms on either side of the scale, but the intention was not to get results on antonyms per se, but to have the participant mark out which one of two different words they felt closest too.

NOT A REAL PANIC SITUATION

The validity of the results can come into question since the tests were not done during a real panic attack situation. Instead, the participants were asked to evaluate the potential of the concepts based on their experiences of panic attacks.

RELIABILITY

The nature of the test was mainly evaluative but it also had a portion of exploration, having a semi-structured interview guide with some questions decided in advance and some questions asked to explore what the individual participants mentioned. The nature of a semi structured interview decrease the reliability as the questions are guided by what the participant chooses to talk about.

Another aspect of reliability is that the little animal concepts had a dynamic feature of changing its appearance by opening up during the test and how this happened was done in accordance with how the participant handled the object. Sometimes the participant touched and handled the object in a way so that it opened up by itself and the test leader did not do the opening of the model. The time the object were in each state was not defined, but deemed on whether the participant seemed to be "finished" with exploring the object in each state. The reliability is lower as the exact same test cannot be replicated.

CHAPTER 18: THE FINAL CONCEPTS – FIGHTING PANIC WITH HAPTICS!

Since the haptic evaluation test was not done in a panic attack situation, and the models used did not fully correspond to the properties of the final concepts (especially in the case of the little birdie), the validity of the statements made in the presentation of the concepts and in the persona stories can be questioned. To achieve a valid description of the product concepts, models with the exact properties of the concepts would need to be tested by persons in an actual panic attack. Furthermore, the concepts would need to be evaluated for a long period of time in order to test whether or not the products can help a person in dealing with his or her panic attacks in a long-term perspective.

19.5 CONCLUSION

Since we did not have the possibility to try our product concepts in a real panic attack situation and with high quality models we cannot know for certain what effect the products will have. However, on the basis on the positive response from individuals with experience of panic attack and experts in the area, we believe that the result that we have achieved have met our aim and goals.

The nature of this project has been very explorative due to the fact that no previous research, known to us, has treated this area. Thus, many decisions have been made on the basis of our limited interview sample's opinions and experiences and on our "designer's instinct". Therefore, the validity of the result of this project is uncertain. However, we believe that our result is valid enough to use as a stepping-stone for further development and testing of the concepts.

20. CONCLUSION

This chapter features a list of the conclusions that could be drawn from the project, both with respect to the result and the process of using design as a tool for fighting panic attacks.

20.1 THE RESULT OF THE PROJECT

- Panic attacks can have many different root causes, but the main issue that we as designers can do something about is the panic attack sufferers' internal focus before and during the panic attack.

- The effect of a product against panic attacks should be to turn the internal focus of the panic attack sufferer to something else. However, this should be done in a way that gives the person space to accept, normalise and reflect upon the panic attack. This in order to avoid creating safety behaviours and avoid maintaining fear of the panic attacks.

- A product against panic attacks should empower the user since they often feel powerless in a panic attack situation.

    - The user should be active when using the product. This means that the user should do things to the product and not the other way around, i.e., that the product is doing things to the user.

    - The users should interact with the product by using their hands since this enables the user to be active, and powerful in the interaction with the product.

    - The interaction with the product should not be unexpected and the inputs given from the product should be congruent.

    - The product should help the users to help themselves in order to take the power of their wellbeing into their own hands.

- A product against panic attacks should aim to help the user feel safe and secure since they often lack these feelings in a panic attack.

- A product against panic attacks should aim to help the user feel more empathy for oneself since they often have a harsh inner dialogue.

- A product against panic attacks should aim to turn the fear and focus on symptoms and thoughts into curiosity for the world around them.

- A product against panic attacks should use haptic inputs to achieve the wanted effect since such inputs have the ability to turn the focus of the user to the input without taking away the opportunity for the user to accept, normalise and reflect upon their panic attack.

- A product against panic attack should use simple inputs, they are enough. There is no need for cool, extravagant and complex inputs; such inputs can have an opposite effect.

- One size does not fit all. One product cannot satisfy all users, instead several products with different properties and functions are needed.

- The product should consider the fact that getting through a panic attack is a process and assist the user in this journey.

20.2 FIGHTING PANIC ATTACKS BY USING A PRODUCT DEVELOPMENT APPROACH

- The product development approach and design methodology can be used as a tool for finding solutions that can help persons suffering from panic attacks. This suggests that the product development approach also can be used for finding solutions to other health issues.

- The design approach utilises visualisations of problems and solutions, making it especially useful to concretise therapy methods and issues of mental health that can be difficult to grasp.

21. RECOMMENDATIONS FOR FURTHER DEVELOPMENT

This chapter contains the authors' recommendations for future development of the concepts developed in this project.

21.1 RECOMMENDATIONS FOR FURTHER DEVELOPMENT

The first step in a future development based on the results of this project is to make more accurate prototypes of the hand and little birdie concept in order to make more valid user tests. However, before embarking on more extensive user tests, an ethical permit for testing and a CE approval for the product must be received.

The products must then be tested in a real panic attack situation in order to evaluate what effects they have on the user and on the panic attack. The products must also be tested for an extensive period of time to evaluate whether or not the user can learn something from them in a long-term perspective, and thus be able handle their panic attacks on their own. Furthermore, different designs on the concepts should be investigated and evaluated in order to find an optimal solution, or several optimal solutions to the products' look and feel.

In the next step, appropriate materials and manufacturing techniques must be investigated and decided, and a manufacturer must be found. Furthermore, the product must be introduced to the market, maybe through therapists or online marketplaces.

22. REFERENCES

American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders,* fifth edition. Arlington, VA.

Angest.se (2016). *Svenska Ångestsyndromsällskapet*.
http://www.angest.se/riks/ (2016-05-24)

Bligård, L-O. (2015). *ACD³ utvecklingsprocessen ur ett människa-maskinperspektiv*, andra upplagan. Teknisk rapport, nr 96, Chalmers Tekniska Högskolan, inst. för Produkt- och produktionsutveckling, Göteborg.

Brown, B. (2010). *The power of vulnerability* [video file].
http://www.ted.com/talks/brene_brown_on_vulnerability (2016-05-24)

Brown, B. (2012). *Listening to shame*, [video file].
https://www.ted.com/talks/brene_brown_listening_to_shame?language=en#t-991906 (2016-05-24)

Brown, B. (2013). *The power of empathy*, [video file].
https://www.thersa.org/discover/videos/rsa-shorts/2013/12/Brene-Brown-on-Empathy (2016-05-24)

Brown, B. (2015). *Våga vara operfekt*. Libris förlag, Örebro.

Calmclinic.com (2016). *Anxiety and the Fear of Dying*.
http://www.calmclinic.com/anxiety/symptoms/fear-of-dying (2016-05-26)

Carlbring, C. and Hanell, Å. (2011). *Ingen panik, fri från panik och ångestattacker i 10 steg med kognitiv beteendevetenskap*, second edition. Natur & Kultur, Stockholm.

Ignition (2016). *The prosthetic leg.*
http://ignition.co/177 (2016-05-24)

Kylén, J-A. (2004). *Att få svar: intervju, enkät, observation*. Stockholm, Bonnier utbildning.

Lantz, A. (2007). *Intervjumetodik*. Lantz, A. (2007). Intervjumetodik. Lund, Studentlitteratur.

Lelo.com (2016a). *Olga - the golden product*.
https://www.lelo.com/olga (2016-05-24)

Lelo.com (2016b). *Ora 2 - the black product*.
https://www.lelo.com/ora-2 (2016-05-24)

MacDorman, K. F. (2006). *Subjective ratings of robot video clips for human likeness, familiarity, and eeriness: An exploration of the uncanny valley*. ICCS/CogSci-2006 Long Symposium: Toward Social Mechanisms of Android Science (pp. 26–29). July 26, 2006. Vancouver, Canada

Mentalhealthce.com (2016). *David Clark's a Cognitive Model of Panic Attacks*. http://www.mentalhealthce.com/courses/contentHD/secHD23.html (2016-05-24)

Nilsonne.se (2016). *Åsa Nilsonne*. http://www.nilsonne.se/om-mig/ (2016-05-24)

Nilsonne, Å. (2008). *Sommar & Vinter i P1 - Åsa Nilsonne* [audio file]. http://sverigesradio.se/sida/avsnitt/369370?programid=2071 (2016-05-24)

Norman, D. (2004). *Emotional Design*. Basic Books, N.Y.

Pruitt, J. and Adlin, T. (2006). *The persona lifecycle: keeping people in mind throughout product design.* Amsterdam, Elsevier.

Psychologytoday.com (2011). *Acceptance and Commitment Therapy - a mindful way to treat disorders*. https://www.psychologytoday.com/blog/two-takes-depression/201102/acceptance-and-commitment-therapy (2016-05-24)

Quora.com (2013). *Haptics.* https://www.quora.com/Robotics-What-is-the-difference-between-tactile-feedback-and-haptic-feedback (2016-05-25)

Sciencelearn.org (2010). *Non-Newtonian fluids*. http://sciencelearn.org.nz/Science-Stories/Strange-Liquids/Non-Newtonian-fluids (2016-05-24)

Semple, D. and Smyth, R. (2013). *Oxford Handbook of Psychiatry,* third edition. Oxford University Press, United Kingdom.

Sverigesradio.se (2009). *Nya rön om depression och ångest*. http://sverigesradio.se/sida/artikel.aspx?programid=109&artikel=3171208 (2016-05-24)

Theguardian.com (2014). *How to refresh your inner Gollum: health and the homunculus.* http://www.theguardian.com/lifeandstyle/2014/jun/11/how-to-refresh-your-inner-gollum-health-and-the-homunculus (2016-05-24)

Thenounproject.com (2016). *Woman by José Manuel de Laá.* https://thenounproject.com/search/?q=woman&i=42689 (2016-07-09)

Theuxreview.co.uk (2013). *User Journeys – The Beginner's Guide.* http://theuxreview.co.uk/user-journeys-beginners-guide/ (2016-05-25)

Trost, J. and Hultåker, O. (2007). *Enkätboken*. Lund, Studentlitteratur.

Uie.com (2004). *The KJ-Technique: A Group Process for Establishing Priorities.* https://articles.uie.com/kj_technique/ (2016-05-25)

1177.se (2005). *Sinnena.*
http://www.1177.se/Vastra-Gotaland/Tema/Kroppen/Nervsystemet-och-sinnesorganen/Sinnen/ (2016-05-25)

1177.se (2012a). *Psykoterapi.*
http://www.1177.se/Vastra-Gotaland/Fakta-och-rad/Behandlingar/Psykoterapi/ (2016-05-24)

1177.se (2012b). *Mindfulness.*
http://www.1177.se/Vastra-Gotaland/Tema/Halsa/Stress/Mindfulness/ (2016-05-24)

LIST OF APPENDICES

APPENDIX 1: SUMMARY OF QUESTIONNAIRE SURVEY

This appendix contains a summary of the results from the survey. As the survey was distributed in Swedish, the summary is in Swedish. Qualitative information where the participants had a chance to write a longer answer has been removed in order to secure the participants' anonymity.

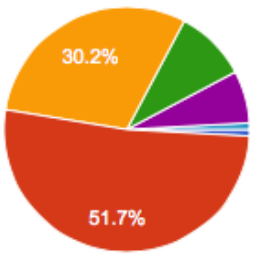
116 responses

View all responses Publish analytics

Summary

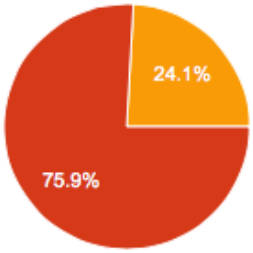
Om dig.

Hur gammal är du?



0-17	**1**	0.9%
18-25	**60**	51.7%
26-35	**35**	30.2%
36-50	**11**	9.5%
51-64	**8**	6.9%
65+	**1**	0.9%

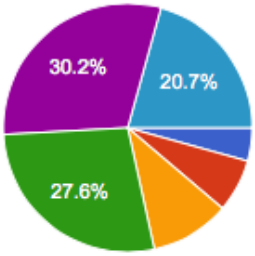
Kön



Vill inte ange	**0**	0%
Kvinna	**88**	75.9%
Man	**28**	24.1%
Annat	**0**	0%

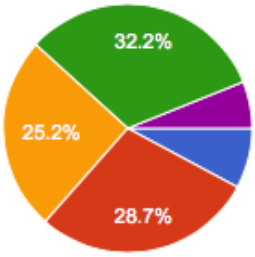
Om dina panik- och ångestattacker.

Hur ofta får du panik- eller ångestattacker?



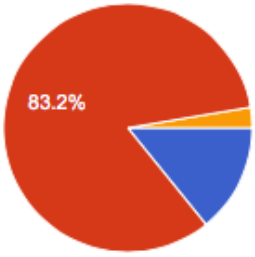
Dagligen	5	4.3%
Flera gånger per vecka	8	6.9%
Någon gång per vecka	12	10.3%
Någon gång per månad	32	27.6%
Någon gång per år	35	30.2%
Other	24	20.7%

Hur länge har du haft panik- och ångestattacker?



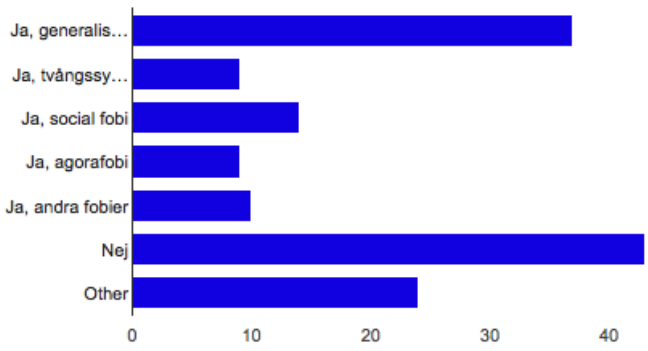
0-1 år	9	7.8%
2-5 år	33	28.7%
6-10 år	29	25.2%
Mer än 10 år	37	32.2%
Other	7	6.1%

Har du fått diagnosen paniksyndrom?



Ja	16	14.2%
Nej	94	83.2%
Other	3	2.7%

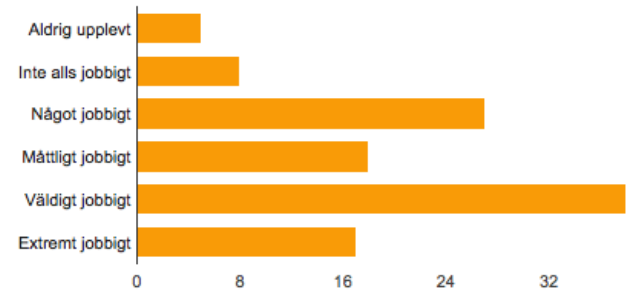
Har du annan ångestproblematik?



Ja, generaliserat ångestsyndrom	37	33%
Ja, tvångssyndrom	9	8%
Ja, social fobi	14	12.5%
Ja, agorafobi	9	8%
Ja, andra fobier	10	8.9%
Nej	43	38.4%
Other	24	21.4%

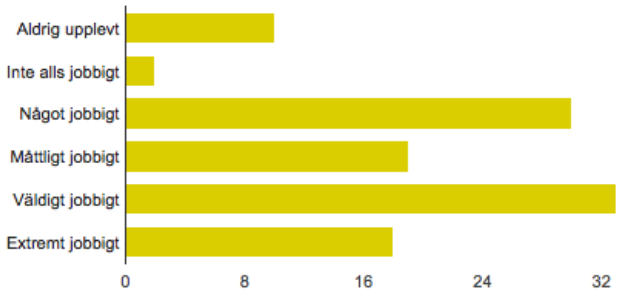
Vilka symptom har du upplevt i samband med en panik- eller ångestattack och hur jobbiga tycker du att de är?

Hjärtklappning, bultande hjärta eller hastig puls



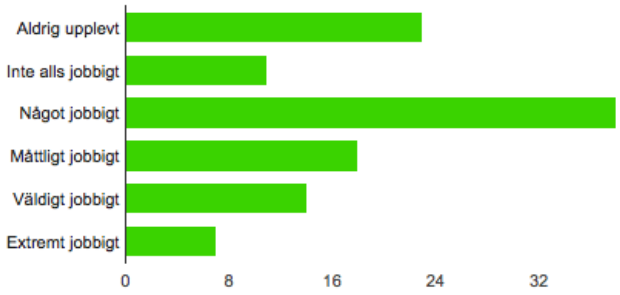
Aldrig upplevt	5	4.4%
Inte alls jobbigt	8	7.1%
Något jobbigt	27	23.9%
Måttligt jobbigt	18	15.9%
Väldigt jobbigt	38	33.6%
Extremt jobbigt	17	15%

Tryck eller tyngdkänsla i bröstet



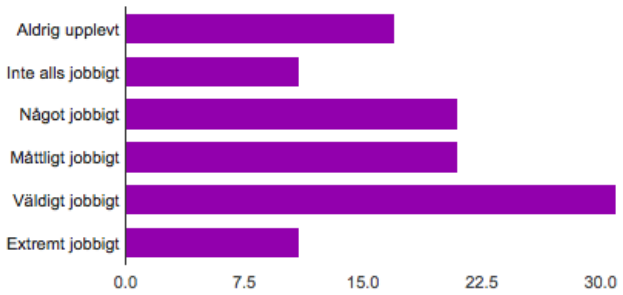
Aldrig upplevt	10	8.9%
Inte alls jobbigt	2	1.8%
Något jobbigt	30	26.8%
Måttligt jobbigt	19	17%
Väldigt jobbigt	33	29.5%
Extremt jobbigt	18	16.1%

Svettningar



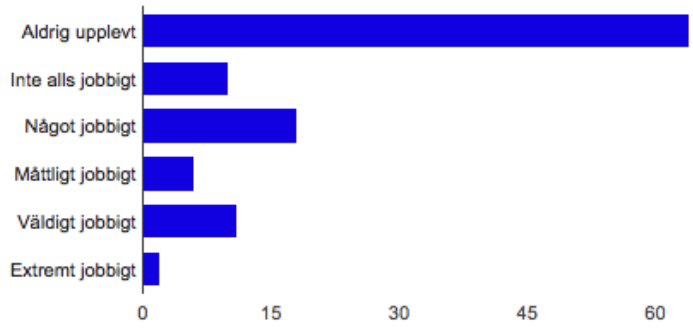
Aldrig upplevt	23	20.7%
Inte alls jobbigt	11	9.9%
Något jobbigt	38	34.2%
Måttligt jobbigt	18	16.2%
Väldigt jobbigt	14	12.6%
Extremt jobbigt	7	6.3%

Darrningar eller skakningar



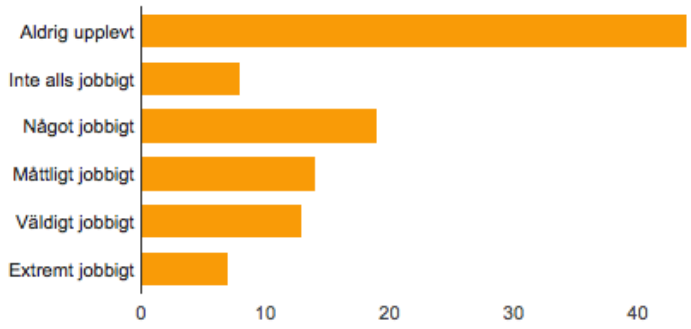
Aldrig upplevt	17	15.2%
Inte alls jobbigt	11	9.8%
Något jobbigt	21	18.8%
Måttligt jobbigt	21	18.8%
Väldigt jobbigt	31	27.7%
Extremt jobbigt	11	9.8%

Stickningar eller domningar



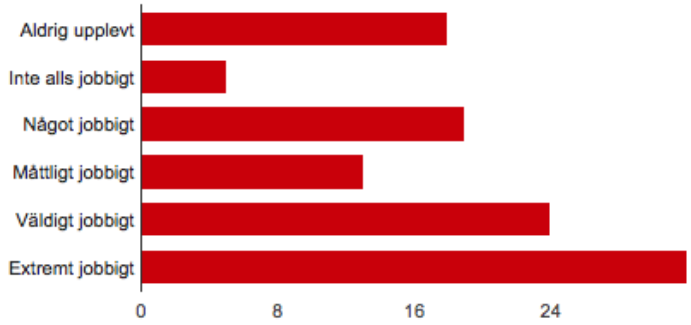
Aldrig upplevt	**64**	57.7%
Inte alls jobbigt	**10**	9%
Något jobbigt	**18**	16.2%
Måttligt jobbigt	**6**	5.4%
Väldigt jobbigt	**11**	9.9%
Extremt jobbigt	**2**	1.8%

Frossa eller värmevågor i kroppen



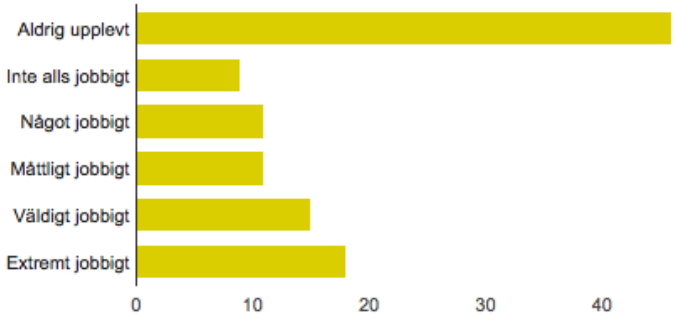
Aldrig upplevt	**44**	41.9%
Inte alls jobbigt	**8**	7.6%
Något jobbigt	**19**	18.1%
Måttligt jobbigt	**14**	13.3%
Väldigt jobbigt	**13**	12.4%
Extremt jobbigt	**7**	6.7%

Andnöd eller svårt att få luft



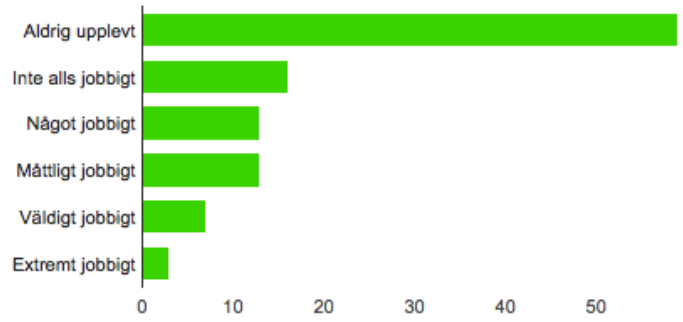
Aldrig upplevt	**18**	16.2%
Inte alls jobbigt	**5**	4.5%
Något jobbigt	**19**	17.1%
Måttligt jobbigt	**13**	11.7%
Väldigt jobbigt	**24**	21.6%
Extremt jobbigt	**32**	28.8%

Kvävningskänsla



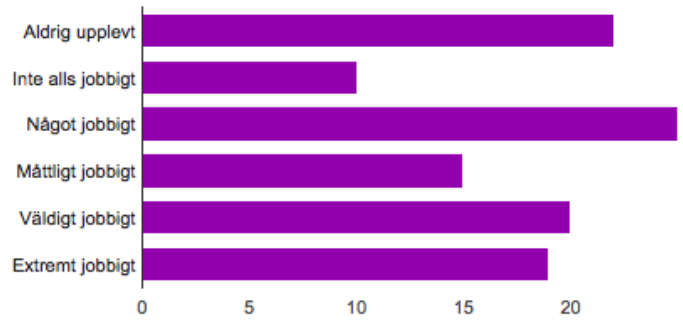
Aldrig upplevt	**46**	41.8%
Inte alls jobbigt	**9**	8.2%
Något jobbigt	**11**	10%
Måttligt jobbigt	**11**	10%
Väldigt jobbigt	**15**	13.6%
Extremt jobbigt	**18**	16.4%

Torr i halsen



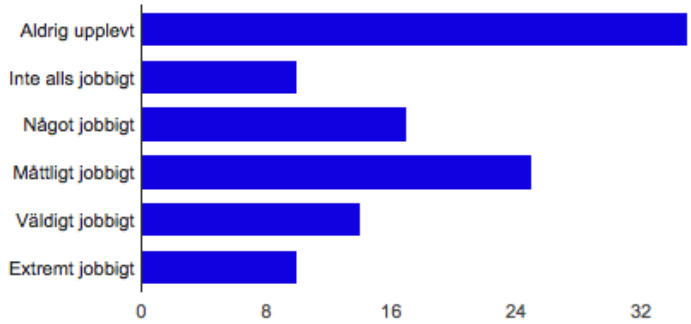
Aldrig upplevt	**59**	53.2%
Inte alls jobbigt	**16**	14.4%
Något jobbigt	**13**	11.7%
Måttligt jobbigt	**13**	11.7%
Väldigt jobbigt	**7**	6.3%
Extremt jobbigt	**3**	2.7%

Illamående eller orolig i magen



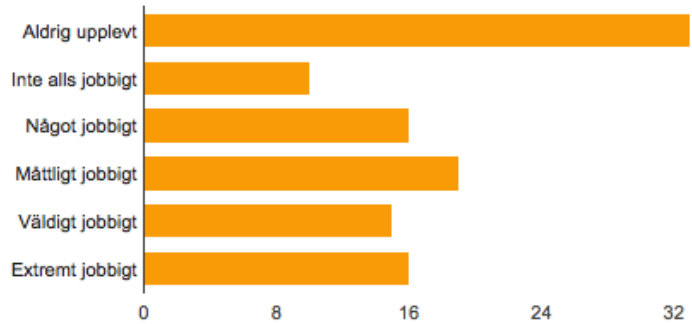
Aldrig upplevt	**22**	19.8%
Inte alls jobbigt	**10**	9%
Något jobbigt	**25**	22.5%
Måttligt jobbigt	**15**	13.5%
Väldigt jobbigt	**20**	18%
Extremt jobbigt	**19**	17.1%

Tunnelseende eller såg suddigt



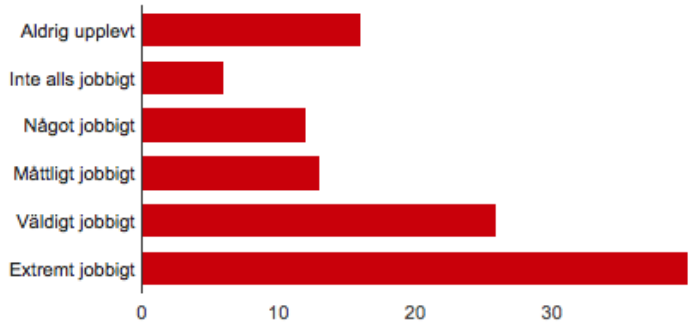
Aldrig upplevt	**35**	31.5%
Inte alls jobbigt	**10**	9%
Något jobbigt	**17**	15.3%
Måttligt jobbigt	**25**	22.5%
Väldigt jobbigt	**14**	12.6%
Extremt jobbigt	**10**	9%

Rädsla för att bli tokig



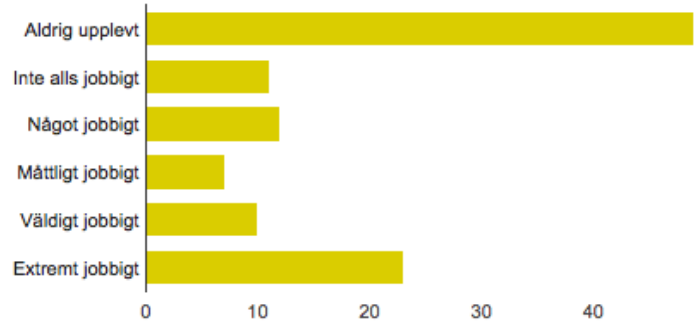
Aldrig upplevt	**33**	30.3%
Inte alls jobbigt	**10**	9.2%
Något jobbigt	**16**	14.7%
Måttligt jobbigt	**19**	17.4%
Väldigt jobbigt	**15**	13.8%
Extremt jobbigt	**16**	14.7%

Rädsla för att tappa kontrollen



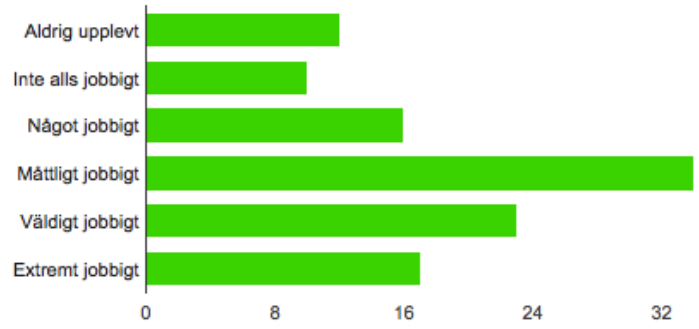
Aldrig upplevt	**16**	14.2%
Inte alls jobbigt	**6**	5.3%
Något jobbigt	**12**	10.6%
Måttligt jobbigt	**13**	11.5%
Väldigt jobbigt	**26**	23%
Extremt jobbigt	**40**	35.4%

Trodde att jag skulle dö



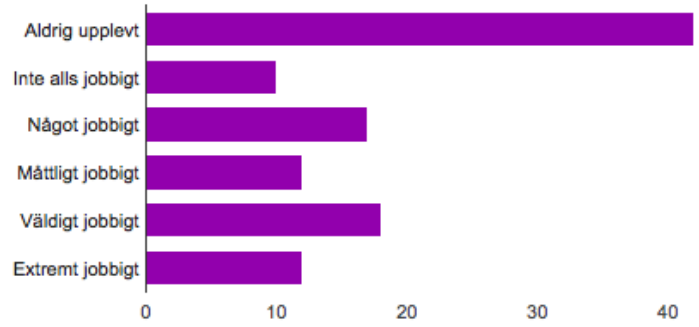
Aldrig upplevt	**49**	43.8%
Inte alls jobbigt	**11**	9.8%
Något jobbigt	**12**	10.7%
Måttligt jobbigt	**7**	6.3%
Väldigt jobbigt	**10**	8.9%
Extremt jobbigt	**23**	20.5%

Yr, ostadig eller svimfärdig



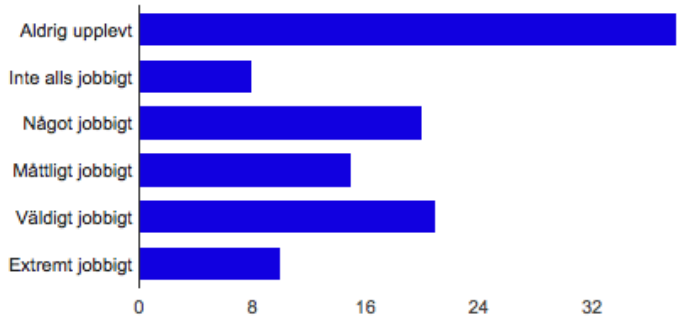
Aldrig upplevt	**12**	10.7%
Inte alls jobbigt	**10**	8.9%
Något jobbigt	**16**	14.3%
Måttligt jobbigt	**34**	30.4%
Väldigt jobbigt	**23**	20.5%
Extremt jobbigt	**17**	15.2%

Allt kändes overkligt eller som i en dröm



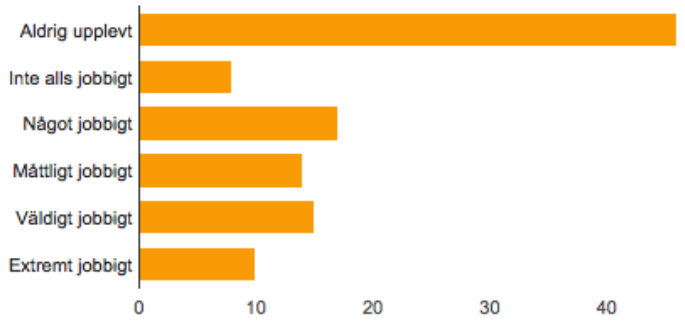
Aldrig upplevt	**42**	37.8%
Inte alls jobbigt	**10**	9%
Något jobbigt	**17**	15.3%
Måttligt jobbigt	**12**	10.8%
Väldigt jobbigt	**18**	16.2%
Extremt jobbigt	**12**	10.8%

Känsla av desorientering eller förvirring



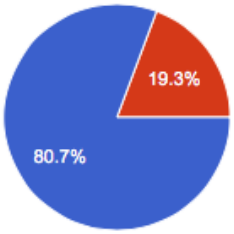
Aldrig upplevt	**38**	33.9%
Inte alls jobbigt	**8**	7.1%
Något jobbigt	**20**	17.9%
Måttligt jobbigt	**15**	13.4%
Väldigt jobbigt	**21**	18.8%
Extremt jobbigt	**10**	8.9%

Känsla av bortkoppling från kroppen



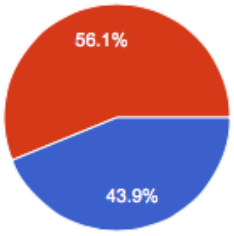
Aldrig upplevt	**46**	41.8%
Inte alls jobbigt	**8**	7.3%
Något jobbigt	**17**	15.5%
Måttligt jobbigt	**14**	12.7%
Väldigt jobbigt	**15**	13.6%
Extremt jobbigt	**10**	9.1%

Känner du till omständigheter som kan trigga en panik- eller ångestattack hos dig?



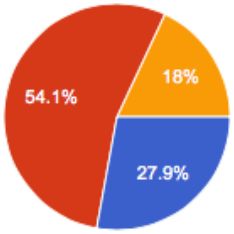
Ja	**92**	80.7%
Nej	**22**	19.3%

Får du någon hjälp av vården för att hantera dina panik- eller ångestattacker?



Ja	**50**	43.9%
Nej	**64**	56.1%

Om ja, upplever du att hjälpen har varit tillräcklig?



Ja	**17**	27.9%
Nej	**33**	54.1%
Other	**11**	18%

APPENDIX 2: PARTICIPANTS

This appendix contains a list of the persons interviewed during the project, both in the investigation and evaluation phases. The persons are kept anonymous but an explanation of their panic attack profile is described in the table below, based on their accounts. The symbol "-" denotes where such information has not been gathered.

TABLE 2.1 PARTICIPANTS

			Panic attack profile			
Alias	**Gender**	**Age**	**Frequency***	**Impact on life****	**Occurrence*** **	**Other issues**
P1	F	18-25	Daily	Medium	Past	Agoraphobia
P2	F	18-25	Monthly	Medium	Present	Eating disorder
P3	M	26-35	Daily in cycles	Large	In cycles	Bipolar
P4	F	26-35	Monthly/daily	Large	Present/past	Exhaustion disorder, separation anxiety, general phobias
P5	F	18-25	Daily	Medium	Past	Agoraphobia
P6	F	26-35	Daily	Large	In cycles	Self-destructive behaviours
P7	F	36-50	Weekly	Large	Past	Exhaustion disorder
P8	F	26-35	Weekly	Medium	In cycles	Agoraphobia
P9	F	51-64	Monthly	Medium	Present	GAD
P10	F	18-25	Monthly	Medium	Present	GAD, depression
P11	F	26-35	A few times a year	Medium	Present	
P12	M	18-25	Monthly	Medium	Present	
P13	M	51-64	Monthly	Medium	Past	
P14	M	36-50	Weekly	Medium	Past	
P15	F	18-25	A few times a year	Medium	Present	
P16	F	18-25	-	Medium	-	
P17	M	18-25	-	Small	-	

* daily/weekly/monthly/a few times a year
** small/medium/large
*** past/present/in cycles

Phone: + 46 (0)31 772 10 00
Web: www.tekniskdesign.se