Fear Fighter Project:
A context-aware solution for treating acrophobia

- Exploring the qualities of the smart phone.

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ABSTRACT

The overall motivation for this project originates from the impact anxiety disorders have on society. The research project Fear Fighter aims to consider a new way of treating these disorders by utilizing the technologies available, in this case the smart phone and context-aware computing. Previous solutions do not rely on scientific or thorough investigations, which are crucial when making solution for treatments that are both emotional and complex. This paper presents a research study that focus on motivating and captivating qualities of the smart phone, useful to take into consideration when designing a comprehensive solution like the Fear Fighter Project. The study sets the ground for further research that involves digital solutions in complex, and sensitive anxiety treatment.

Keywords

Acrophobia, Smart phone, Captivating Qualities, Cognitive Behavioral Therapy, Fear Fighter Project, Context-Aware Computing.

1. Introduction

There are currently defined approximately 500 different types of phobias, everything from acrophobia (fear of heights) to social anxiety, etc. In Denmark about 1-5% of the population (60.000-300.000) suffer from either one or more types of phobias that will require treatment [10]. It affects people's everyday lives and the extensiveness of the problem has statutorily resulted in necessary legal privileges for treatment of the disorder, thus creating an economically onerous situation in the society [11]. Both the society and the economy are adversely affected, because many of the individuals with phobias are prevented from doing their jobs proberly or they reach a level where they are not able to work at all. By making research contributions in context-aware computing and digital services we can alleviate some of the challenges that requires a certain sensitivity towards the context in which the use of technology is to be utilized. The mobile phone and more recently the smart phone are interesting media for treating phobias, due to the fact that they are integrated in people's everyday lives [3].

Numerous studies have given credence to the mobile technology's dynamic and communicative ability to be a successful mean in e.g. withdrawing people from smoking [1, 2]. In addition, recent studies have substantiated the use of mobile phone technology in the practice of Cognitive Behavioral Therapy (CBT), however without providing sufficient data or suggestions for an integration of a fully functional and effective system [1].

The basic element for CBT is to have the patient confront and remedy the irrational thought that provokes the anxiety, instead of avoiding it. Through therapy sessions the patient is introduced to a set of techniques to help reduce the symptoms. By increasingly being exposed to their fears and by applying the acquired techniques in the situation, it will gradually reduce the anxiety until the symptoms do no longer occur [7].

This paper has its offset in The Fear Fighter Project (FF Project), which is a proposal for a complete therapy program for treating acrophobia [9]. The system is intended for a certain target group who are people afflicted with a severe condition of acrophobia, often requiring professional treatment. The treatment program is meant to be free of charge and anonymous. It takes place at a public location, the IT University of Copenhagen, from an application on the patient's own smart phone. The system requires technical attributes such as the smart phone as the main technology and a tracking system. The treatment program builds on CBT, and will primarily consist of different in vivo exposure exercises, and proceeds over a period of ten days. The fact that the treatment is extended over several days raises issues concerning motivation and engagement of the users in the FF Project. Among professional therapists, a general agreement is that the most important aspect of CBT is the relationship and trust that the patient builds up with their therapist [7]. The fact that the users have no direct personal contact to a therapist in the FF Projects' treatment also raises some motivational issues.

In this paper our intention is not to design a complete solution to the problem, but to investigate how qualities of the smart phone can be exploited in the design of such a comprehensive, context-aware and digital solution with regards to motivational factors for the users to engage in it.

2. Research Design

2.1 Methodical approach

In our research study we wanted to understand the phenomena of being exposed to one's anxieties, in this case acrophobia, while the smart phone serves as a mean to keep the situation under control. The assembled study is grounded on a wish to account for the smart phone's involvement in the FF Project's vision and in further research in this area and context. This was done by collecting evidence from a preliminary study at the IT University

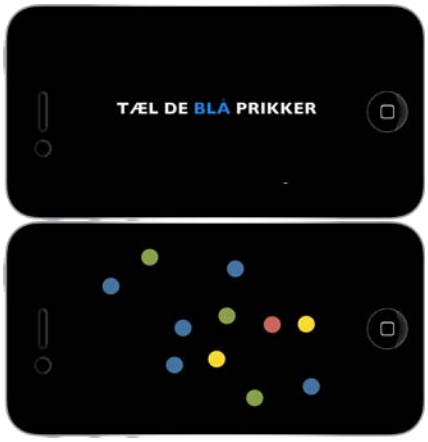
of Copenhagen, which we employed to construct a deeper contextual meaning in a follow up focus group interview. The questions how, what and why indicated motivational reasons for the target group to engage in the FF Project. Since the FF Project separates it self from other design solutions close to this topic by researching in more complex context-aware services, these were vital data for our focus on motivational factors.

Characteristics adjoining the phenomenological approach are to learn what the participants experience in certain situations and how they experience it. Through simulation and enactment in a controlled environment researchers are able to collect comparable data. This data utters something about the user experience, interactivity, and the potential, which mobile devices have to offer [6]. In order to get deeper into findings from preliminary studies, it can be beneficial to supplement with interviews [6]. At the same time scenarios and personas, have proven to be useful in creating empathetic insight from participants during e.g. a focus group interview.

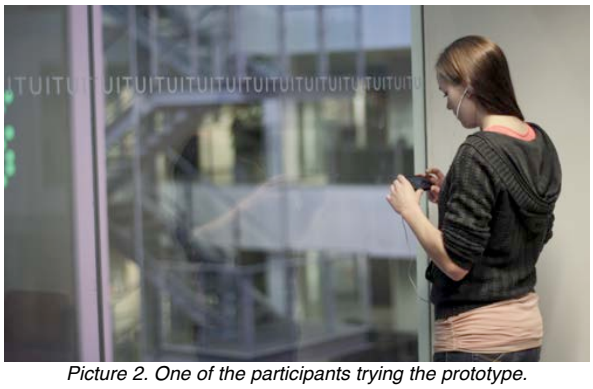
Based on these theories on how to merge research methods for understanding mobile technology use, we assembled our study.

2.2 Preliminary investigation at the IT University of Copenhagen

During the public event *Kulturnat 2011* we constructed a situation with focus on simulation at the IT University of Copenhagen. 38 people with various grades of fear of heights participated. They were exposed to heights inside the building and were introduced to anxiety reducing techniques, which should enable them to cope with their fear immediately. These techniques were breathing, focusing and stepping exercises. Some participants received techniques from a psychotherapist and some through a prototype on a smart phone. The prototype consisted of a video, which was shown, in a full screen version, directly on YouTube. The video presented three techniques in two different combinations; either with text or with a combination of text and the voice of a therapist. In addition to the three different presentation methods (a therapist and the two versions of the prototype) we created a fourth situation to account for the placebo effect. This meant that the participants in this situation were not exposed to the techniques.



Picture 1. Here is an example of one of the techniques presented in the prototype. The participants were to focus on the dots, counting each of the blue ones that would appear on the screen.



Picture 2. One of the participants trying the prototype.

The main focus for us was to observe the behavior of the participants while they were interacting with the smart phone contrary to the therapist, hereby reaching an understanding of the phenomena.

Picture 3. One of the participants is receiving some techniques from the therapist.

2.3 Focus group interview

Subsequently we conducted a focus group interview with three participants from the preliminary investigation, with moderate to severe anxiety, and a therapist who participated in the discussion as an expert, representing her previous anxiety patients. The focus of the interview was on the use of the smart phone, as well as the participants' experiences with their anxiety. These led to a debate about motivational factors connected to the smart phone in the Fear Fighter program. Open-ended questions were formed and divided into themes, based on our findings from our preliminary investigation. Furthermore we used the method Persona and Scenarios, to make the participants relate to the phenomenon from the eyes of a persona with a severe condition of acrophobia.

2.4 Critic of methodology

Only few participants in our investigations could approach similarities of the FF Project's proposed target group. This means that the results cannot be generalized, and are not representative of the whole population of persons with severe acrophobia.

When involving people in studies revolving around sensitive areas such as anxieties, ethical considerations are to be made. In this regard, we collaborated with two psychologists during the planning and execution of both studies, making sure that the participants were under supervision.

3. Findings

3.1 Similarities between the smart phone and the therapist

From the preliminary investigation we found that the participants were positive towards being presented to techniques through a smart phone; they saw it as a distraction from the fear, and as a support. One girl showed a huge amount of fear, but was able to focus on the smart phone performing the techniques step by step while feeling more relaxed. The majority of the participants expressed that the reasons for this relaxing effect were clearly the sound of a calm voice.

As we proceeded with the interview it was confirmed that there had to be certain motivating elements connected to the smart phone, in the design of the FF Project, in order to retain the users in such a program. A participant in the focus group said:

”It can be a problem that the treatment takes it course through the smart phone. It is all up to you, and no one else. No one is pushing you to do it. You are afraid of heights, so why would you expose yourself voluntarily to heights here at ITU?”

3.2 Game as a motivational factor

An interesting finding from the focus group was that the participants mentioned game elements as a motivational factor. The therapist corresponded by saying that it could be of significance to involve challenge in a CBT program, but without exaggerating it.

Additionally, one of the participants stressed, “It is always nice to be able to measure ones success”. The others agreed on this. At the same time one of them mentioned that it is important that success is not measured in e.g. how many apples you can get as points, but it should be meaningful and appealing compared to the situation in which you are in, in this case a very sensitive and complex context. The complexity in the future application, should supplement the complexity of the future program, reaching and motivating the target group on a deeper level. This will be further elaborated on in the discussion.

4. Discussion

When designing for a complex scenario, where the goal is to treat people with fear of heights, there are a lot of elements to take into account. The application connected to this scenario has to be intelligent and more profound than the kind of applications we normally develop. The Fear Fighter application is connected to a strict program, and a location-based tracking system. At the same time it has to deal with humans in sensitive situations. Sensitivity is an essential part of design and it is important that we show much consideration towards this [8].

In this section we will discuss qualities of the smart phone that are important to take into consideration, when connecting the device to the designing of the future FF system. This will be in relation to our findings.

4.1Motivation

Bill Gaver states that human beings are playful creatures, as he calls them ”Homo Ludens” [5]. “Play is not just mindless entertainment, but an essential way of engaging with and learning about our world and ourselves — for adults as well as children” [5, p. 3]

The play elements though, should not take over the goals and rules that are incorporated in the treatment process. There has to be found a middle way where the elements assert as a motivational factor.

Löwgren defines two captivating qualities in digital artifacts as “playability” and “seductivity” [8]. Seductivity entails “...Enticement (attracting attention and making an emotional promise to the user), Relationship (making progress with small fulfillment's and more promises, possibly lasting for long time) and Fulfillment (making good and final promises and ending the experience in a memorable and positive way)” [8, p. 132].

An important aspect of the FF treatment process is the relationship between the partial goals and greater promises. Reaching a certain goal e.g. getting rid of an anxiety is what must keep them motivated and captured.

Seductivity seduces the user, whereas, playability is described as making the users addictive [8]. Playability is important in order to give the users a sense of joy, it appeals to the intrinsic motivation that drives Homo Ludens. E.g. reaching a goal, getting from first floor to second floor [8]. It is important to supplement playability with seductivity.

As mentioned in the findings the participants were able to connect to the smart phone, but in order to capture their attention and withhold them in a therapy program, it could be beneficial to integrate the following playability qualities in the design of the smart phone’s application, as ways of engaging the users in an emotional process:

Challenge: The application should challenge the users and their anxiety by gradually exposing them to heights during the treatment. For motivation, they are given an opportunity to measure and visualize their success during the treatment.

Curiosity: The application should awake the users’ curiosity by making them wondering, how far they can go, with the smart phone as a mean and if they are able to cope with the anxiety situation.

Control: The user should have control over the application, e.g. the length of the techniques or which techniques to use, and be able to stop if the anxiety level rises.

Norman states that users have to distinguish between the words "complicated" and "complex", because life today is complex and we need technology to embrace this complexity, without making it confusing, as users think about many products, when they interact with bad designs. To cope with the complication, the application must be understandable, sensible and meaningful for the user [12]. By combining seductivity and playability, it is possible to create a relationship between the application and the user that is necessary for motivating the user to complete the treatment. Furthermore it creates hints and clues for the user and makes the application more understandable and meaningful. The term sensibility is an important aspect that will be a part of the future design of the application. In a situation where the users experience anxiety, emotions are controlling them. In these situations, it is important that the play elements are not visible. There should be a fine balance between the seriousness of the situation and the playability qualities.

5. Conclusion and Further Research

The paper has through a phenomenological approach provided a ground for further research. We have discovered and discussed motivational factors for engaging the users in the FF Project, and

which qualities of the smart phone that could support this engagement. Besides the audible and visual qualities, the smart phone's ability to portray game elements creates seductive and motivating reasons for the users to engage in the FF treatment.

However this area of interest does not provide any conclusive solution for a comprehensive design. There are other aspects to include when investigating user experience, such as physical, sensual, cognitive, emotional and aesthetic [4].

Another finding that we have not mentioned was the wish for an online community, connected to the program. According to Löwgren network games, contrary to single games, entails a whole new class of motivation, based on the social interactions [8]. Doing something together with other people is a huge motivational factor, which could supply the FF concept with great value [8, p. 127]. Our participants felt that the smart phone in a longer therapeutic treatment without direct contact to a physical therapist cannot stand alone. This is worth considering in future research.

Further research should also involve people with severe acrophobia and take place over a longer period of time, in order to build on our findings. Along with the above mentioned, additional research within context-aware computing has to be made, more specifically, in regards to the tracking technology (BLIP) that will enable the therapeutic exercises to be monitored and moderated in accordance to the specific patient's needs.

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