
Fear Division; Archiving the Intangible

Dorien Neema Koelemeijer

Malmö University
Malmö, Sweden
info@dorienkoelemeijer.com

Franziska Maria Tachtler

Malmö University
Malmö, Sweden
info@franziskatachtler.com

Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for third-party components of this work must be honored. For all other uses, contact the Owner/Author.

*Copyright is held by the owner/author(s).
CHI'16 Extended Abstracts, May 07-12, 2016, San Jose, CA, USA ACM
978-1-4503-4082-3/16/05. <http://dx.doi.org/10.1145/2851581.2889465>*

Abstract

This paper describes the theoretical grounding, the concept and the construction of an embodied interactive installation about fear. The processes in the brain when exposed to fear, the memories related to it and the triggering of these memories are taken as a starting point. The functionality and design of the installation are based on the findings of neuroscientific research and the distribution of cultural probes. The neuroscientific research encompassed the exploration of two parts in the brain, the amygdala and the hippocampus, that cooperate when processing fear reactions. The acquired knowledge about these processes in the brain that is active when encountering fear enabled us to make informed decisions during the design process. Additionally, the cultural probes provided new insights about different fears and the content for the installation. The goal of the audiovisual installation is to give people more insight into the subject of fear, by offering them an interactive experience that is based on the archiving and retrieving of emotions and sounds related to fear.

Author Keywords

Fear; Memory; Decoding; Embodiment; Installation

ACM Classification Keywords

H.5.3 Information Storage & Retrieval

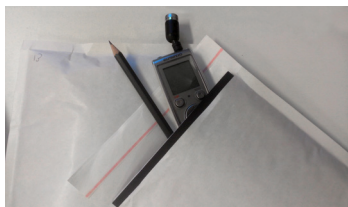


Figure 1: The distributed cultural probes package

Introduction

Fear is a common and recurring emotion, shared by people all over the world, and plays a part in everyone's lives. However, many people don't have a lot of knowledge about the different types of fear, and how fear actually works. This can be explained by the fact that fear is regarded as a negative and personal emotion that people would rather not talk or think about. We therefore decided to create an embodied interactive installation that opens up the topic of fear in an experience-based and personal way, yet doesn't focus solely on the negative aspects of the emotion. Accordingly, the installation "Fear Division" provides an audiovisual experience that makes the visitor aware of different fears and the stories related to these fears. The fear memories and the sounds triggering these memories are stored in the installation and can be retrieved by the visitor, by interacting with the installation. After experiencing the installation, visitors get the opportunity to record and share their own stories related to fear. In the following sections the grounding, concept, design process and future directions are described.

Grounding

Theoretical Research

There are two systems in the brain, the amygdala and the hippocampus, that cooperate during the processing of fear reactions [5]. The processing of this emotion depends greatly on memory, which was taken as the basis of this interactive installation. The amygdala reacts on external stimuli and is responsible for fear conditioning [4]. Additionally, it regulates the encoding and the storage of hippocampal-dependent memories. The hippocampal complex is responsible for episodic representations of the emotional understanding and

interpretation of events. Therefore, its connections to the amygdala may influence the response when emotional stimuli are encountered [5]. At the one hand, evolution has caused humans to feel fear when encountering recurring and common danger to be able to make fast decisions in life-threatening situations. However, there are also threats that are not genetically programmed, but are determined by experiences and memories [1].

Another aspect related to fear and memory is the ability of music or sound to trigger fear memories [6]. Therefore, hearing a fragment of a song or a sound can bring back memories of fear. The amygdala plays an important role in the processing of auditory fear memory, by giving a specific fear response upon receiving projections from the auditory thalamus [3]. The distinctive functions of the amygdala and the hippocampal complex, and the fact that these functions depend on (auditory) memories related to fear, and the triggering of these memories, formed a strong grounding for the installation.

Cultural Probes

As the theoretical research indicates, fear is a subjective topic that depends largely on the memory and experiences of a person. Therefore, cultural probes [2] were created and distributed to ten different people in order to compile personal stories and insight about fear from external sources. The cultural probes consisted of a small notebook, a pencil and a dictaphone (*Figure 1*). The notebook contained questions related to fear, which the participants were asked to answer through audio recordings, using a dictaphone. The participants proved to be willing to share a lot and, therefore, the results of the cultural probes were surprisingly insightful and diverse.

Related Work

Besides the theoretical grounding and outcomes of the Cultural Probes, design pieces related to fear and neuroscience were an inspiration for the design for "Fear Division". A related installation discussed in the field of interaction design is "Control of Fear" [9]. This interactive installation picks out fear as a central topic, the content of the installation, however, focuses on fears caused by catastrophes such as natural disasters, terrorisms and epidemic diseases, rather than personal fear. Additionally, we were inspired by the work "Entity I" (2010) by Phillip Stearns that is based on the artist's interpretation of the neuronal network. "Entity I" is an interactive installation using light and sound, and employs these by using an abstract and minimalistic aesthetic. The installation reacts to light, temperature and sound, and by this means responds to the presence of a person or changes in the environment [7].

Concept

The concept for the embodied interactive installation was formed, based on the theoretical research, the related work, and a selection of the recordings obtained by the cultural probes. The aim of the installation is to archive the intangible. In this respect, the intangible were the feelings and memories related to fear and the triggering of these memories.

The knowledge acquired by the neuroscientific research has helped in making design decisions for the installation, especially regarding the encoding of the stories. The functions of the amygdala and the hippocampus were an inspiration with regard to the division of the audio. For each fear story, the audio was divided in three categories: the voice recordings of fear memories acquired from the cultural probes, the sounds triggering these memories and abstract sounds.

To represent the hippocampal complex, fragments of the recorded stories were used. To symbolise the amygdala, abstract and natural sounds that trigger the specific fears connected to the recorded memories, were chosen.

Five different fears were selected to be addressed in furtherance of making it more likely that many users will relate to certain fears, alongside raising awareness of some fears they were not familiar with before. The purpose of the installation is to offer a poetic, yet abstract approach to the topic of fear, and by this means make people more aware of different fears and the role that sound plays in the triggering of fear memories. Moreover, the feeling of fear is a very private emotion and is difficult to decipher. Therefore, it was decided to make the installation a personal experience and allow only one person at a time to enter the installation.

Design Implementation

Based on the cultural probes it was determined that the installation should be a dark cube, with thirty wires or tubes, initially inspired by neurons in the brain, hanging from the ceiling. The thirty tubes are divided to represent the five different fears, retrieved by the cultural probes. It was decided to preserve the original voice recordings from the people participating in the cultural probes, in furtherance of keeping the installation personal and realistic.

All participants of the cultural probes talked about a dark and empty room when describing the setting associated with their fear. Furthermore, while analysing the documentary video about the interactive art installation "Control of Fear" [8], the difficulties of finding images and timeless video material representing fear became apparent. Accordingly, the aesthetics of



Figure 2: First functional prototype

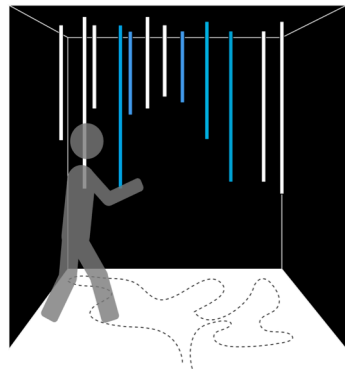


Figure 3: Sketch of the installation

the installation are minimalistic; the only elements in the dark installation are the different sounds, and tubes containing LED lights (Figure 2). Whenever a tube is touched, it lights up and a sound or story is triggered to play. Furthermore, the other tubes related to that specific fear light up, in order to guide the user through the installation (Figure 3). It is also possible to touch several tubes at the same time, and hereby sound compositions. In the installation a whispering sound is present until one of the tubes is touched, to make the user realise that personal stories are shared, and gives the user a sense of being inside someone else's brain and listening to their thoughts.

Future Directions

For future development, the design and functionality of the installation could be improved in order to intensify the sensory perception and the body experience of the installation. Particularly the manner in which the user gains access to the different stories could be explored further. Encouraging the user to crawl through parts of the installation, for instance, would alter and possibly intensify the physical experience. Even though several aspects could be developed, the installation provides the anticipated atmosphere and offers the visitor an experience that opens up the subject of fear in the way it was envisioned.

References

1. Jacek Debiec and Joseph LeDoux. 2004. Fear and the Brain. *Social Research*, 71, 4 (December 2012), 807-818.
2. Bill Gaver, Tony Dunne and Elena Pacenti. 1999. Design: Cultural probes. *Interactions*, 6, 1 (January 1999), 21-29. <http://doi.acm.org/10.1145/291224.291235>
3. Jin-Hee Han, Adelaide P. Yiu, Christina J. Cole, Hwa-Lin Hsiang, Rachael L. Neve and Sheena A. Josselyn. Increasing CREB in the auditory thalamus enhances memory and generalization of auditory conditioned fear. *Learning & Memory*, 15, 6, 443-453.
4. Joseph LeDoux. 2003. The Emotional Brain, Fear, and the Amygdala. *Cellular and Molecular Neurobiology*, 23, 4-5 (October 2003), 727-737.
5. Elizabeth A. Phelps. 2004. Human emotion and memory: interactions of the amygdala and hippocampal complex. *Current Opinion in Neurobiology*, 14 (April 2004), 198-202. <http://dx.doi.org/10.1016/j.conb.2004.03.015>
6. Hervé Platel. 2005. Functional Neuroimaging of Semantic and Episodic Musical Memory. *Annals of the New York Academy of Sciences*, 1060, 1 (January 2006), 136-147. <http://dx.doi.org/10.1196/annals.1360.010>
7. Phillip Stearns. 2010. Entity I. Retrieved October 6, 2015, from <http://phillipstearns.wordpress.com/projects/entity-i-2010/>
8. Chin Chin Yang. 2011. The Control of Fear. Video. (2011). Retrieved October 6, 2015 from <http://vimeo.com/19244558>
9. Chin Chin Yang, Lipin Liu and Jacy Chen. 2005. The "control of fear": an interactive art experiencing and presenting system with multimodal sensors and media. In *Proceedings of the 13th annual ACM international conference on Multimedia (MULTIMEDIA '05)*. ACM, New York, NY, USA, 559-562. <http://doi.acm.org/10.1145/1101149.1101277>