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EMOTIONS, FEAR, AND EMPATHY:
A DESIGN APPROACH TO HUMAN EXPERIENCES

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INTRODUCTION

I am fascinated by the evolution of emotions in humanity, and the role they play in the global arena, from conflicts and diplomacy, to progress and policy implementation. In particular, I have been exploring one of the most primitive intrinsic emotion of humanity, fear, investigating the myths and facts of this sentiment. The special interest in fear has sparked from an early exploration of human’s social evolution and the tendency of our societies to promote happiness and optimism as the climax of one’s existence. The indirect effect of such existential search for positivism fails with great shock, when events take a negative turn. As Oliver Burkeman noted in his book, “The Antidote: Happiness for People Who Can’t Stand Positive Thinking,” living in constant positivism will only make for distress and consternation to have a deeper impact in the mind of the positive thinkers (Alter).

This thesis is the exploration of the other end of the spectrum: the collection of unpleasant and unfavorable settings, which we so fervently try to avoid, only to be surprised by their unexpected experiences and be reminded of our negligence. In this context, fear has been particularly disregarded, enduring its troublesome characteristic. Here, I question the ‘what if’s’ of fear, exploring the possibilities that this intrinsic human emotion holds, from producing imagination, to enhancing our being and creating empathy.

In recent years, social activists and global advocates have been expressing the significance of human centered methodologies, stressing the need to increase our talent for empathy. The field of design has equally embraced the power of empathy, addressing it as a practical approach to truly understand the experiences of others. While embracing this belief, I am of the opinion that we are far from realistically and experientially empathizing with others. The research in this thesis comments on the meaning of empathy and opens a debate for its connection to fear, using design as a mediating tool for intervening on social relationships.
ABSTRACT

Fear is an intrinsic human emotion, which produces with variable intensity a bodily reaction as a response to a stimuli. It is considered one of the basic human emotions, and it is universal of all animal species. Despite its subjective quality, fear has gained a rather negativistic stereotype that this research intends to debate and readdress, proposing that “negative fear” is part of an evolutionary transition cultivated by social and cultural constructs. This thesis will analyze the context in which fear operates, employing experience design methodologies and design research to reevaluate the role of fear in the contemporary settings of our societies to prove its connection to imagination, transhumanism and the production of empathy.

After a brief historical perspective to situate this thesis in the contemporary framework of experience design, this research will investigate fear as prolific tool for the production of imagination, derived from its aesthetic connection to wonder and pleasure. This particular connection between fear to wonder was investigated among others by Charles Darwin, who also promoted the functionality of fear as the key to animal survival. The complex mechanism in which fear engages us will lead to the production of design prototypes that look at the animal kingdom and several other species’ talents in the detection and implementation of fear as a tool to survive. Here, the potential of our species to further evolve through the use of design will open a discussion on transhumanism and the future of humanity.

The last section speculates a counterfactual conditional statement of how our humanity would operate, if emotional identities were reevaluated. In particular, the emotion of fear will be reevaluated for its unpleasant characteristics, from the bodily sensations to the mental postliminary conditions, to understand why certain human behaviors are still exercised, when the physiological effects are universally acknowledged as distasteful. By interpreting the physiological impact of fear, this research will continue its argument towards empathy, questioning what it truly means to ‘stand in someone’s else shoes’, specifically when fear is practiced. Empathy, as a pilaster in the mission statement of many contemporary disciplines, has surfaced in this research as viral phenomenon, which little has to do with truly ‘empathizing’. Here, it investigates how empathy can be experienced when fear is in play: if sharing fear as the bodily experience of someone else can lead to the production of authentic empathy, then humans have a chance to reevaluate its application in the contemporary global topics of war and diplomacy, domestic and public violence, or bullying to name a few.

This research hopes to establish a new perspective on the role of emotions in our societies, and create a connection between design and the experience of intangibles, producing a view of the intrinsic systems of our being as ones deemed of value in the ambitious evolution of our species.
CONCEPT

Fear is as much of an emotion as it is a primitive animal mechanism. Within humanity, it is the product of evolution as a social and cultural construct, in which its biological function and physiological impact remain very primitive.

As a designer, I want to operate in the unanswered challenges of human evolution, trying to understand the why, where, when and how design should intervene on human behaviors and relations. The manipulation of emotions and the use of fear are the drive behind this research thesis, in which I explore the centuries of civilization and human evolution, after which humans still fail to understand one another, perpetuating violence, brutality, physical and emotional abuse, traumas and horrors as related to the experience and use of fear. Meanwhile, we emphasize the need for empathy, morality and ethics as monuments of human progression.

I want to answer why certain irresolute explanations about our humanity find justification in the ‘being human’ factor itself. I believe that experience design methodologies have the power to debate the standards we have already accepted, and identify the progress we must implement.

QUESTION

How can experience design utilize intrinsic human experiences to trigger empathy?

How can experience design authentically reproduce the emotion of fear?

How can experience design amend the image of fear?

Keywords: fear, empathy, design empathy, design emotions, sensorial experience, senses, emotions, sharing, change, evolution, imagination, function, wearable technology, transhumanism, experience design, ethics, morality, humans, interdisciplinarity, design research
ACKNOWLEDGEMENT PAGE

A couple of months ago while researching layouts and templates, I came upon a very amusing article that analyzed the most neglected sections in a research thesis. It turns out that after end- and footnotes, bibliography and image captions, the ‘Acknowledgement’ page is naturally disregarded by most readers, with perhaps the exception of one’s parents. On the other end of the spectrum, to make it to the top of the most acknowledged sections, there are the abstract and concept pages, which, if summarized even more, they would be awarded with the title of ‘Best Short in Academic Research’.

Without further ado, I would like to thank first and foremost my thesis advisor, Jenny Althoff, for her essential expertise to my research and immeasurable support during the process. Exchanging ideas, developing concepts and working alongside Jenny has far surpassed any expectations I had before entering my graduate education: she has been an exceptional mentor and enthusiastic protagonist in my academic experience.

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A very special thanks is extended to Kevin Grennan, who without hesitation shared his research on human-robot relationships, and his expertise on speculative design as a model for innovation and knowledge production, reassuring me of design’s ability to push the boundaries of social norms and fictional comprehension.

My deepest gratitude goes towards my parents, Cristina Busolli and Claudio Polinedrio, for having supported me all of these years in my academic and professional efforts. Thank you for the invaluable
inspiration you have transmitted me through your work and sacrifices; for the encouragement in pursuing design; and for the enthusiasm for knowledge, allowing me to grow it through travels to Europe’s most ancient ruins, the art, design, technology and science museums visited in rainy weather, and with the opportunities to further my studies and interests around the world. Above all, thank you for granting me the childhood wish to have a sister, Maddalena, who I am indebted for the inspiration, encouragement and exceptional moments spent together, arguing, laughing, cooking, debating, eating and living. Thank you for the accelerated course on survey making and result analysis: without your help, I would have never known what the Likert scale is and how to use it!

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1

INSTRUMENT

A very brief history
The culture of fear
Fear and fictional threats
Design and phobias
Designer’s role and responsibility

Appendix
A VERY BRIEF HISTORY

Fear is an innate human emotion. Along with anger, disgust, happiness, sadness and surprise, it forms the standard six basic emotions experienced by human beings. A controversially superb asset for our existence and evolution, fear has long been characterized by an overly negative stereotype. From philosophy to anthropology, economics to politics, fear has been marked as a psychological and physical obstacle to the well-being of individuals and the progress of societies.

Long viewed as a paralysis in human interactions, fear has been illustrated by philosophers, anthropologists, psychologists and government analysts, as one of the most effective emotions propelling humans to be counterproductive, to act irrationally and inhumanely toward one another, to affect judgement, and to impound opportunities (Ludlow 1). As highlighted by Peter Ludlow in his short essay “Fifty States of Fear,” British philosopher Bertrand Russell wrote, after seeing the effects of World War II in Europe, that “neither a man nor a crowd nor a nation can be trusted to act humanely or to think sanely under the influence of a great fear” (Ludlow 1).

The reason why fear has garnered such a bad reputation is deeply rooted in the history of mankind. I ought to make a very small parenthesis about the historical events and literary examples that have formed the founding image of fear today.

As such, fear has been adopted by a variety of parties, socially, religiously and politically, to obtain manipulation, blind faith and control. Possibly one of the earliest examples is found in religion, where the fear of god becomes a way of living in repentance. In Christian discipline especially, fear is adopted as a control tactic: the idea that, to win the gates of heaven one must comply with the rules of the ten commandments and behave in accordance to righteousness, is a business for the Christian church to manipulate its followers and generate guilt for control (Spong).

If not the most interesting example of fear as manipulation in fiction, George Orwell’s Nineteen Eighty-Four uses the nominal figure of Big Brother as an omniscient and omnipotent form of control by the governmental institution of IngSoc over the population of Airstrip One, where the protagonist Winston Smith lives. When he is captured by his antagonist, O'Brien, Winston is terrorized using his biggest fear, in order to manipulate, brainwash and get valuable information out of him. The Winston that exits the interrogation is a well-behaved, forever faithful and disciplined individual, who loves his government and his ordinary life in the unfair Airstrip One (Orwell).

Even though Nineteen Eighty-Four is a literary example, George Orwell’s novel offers a fictional reflection of the actual historical events that were occurring globally during the time the book was written. Its themes are well influenced by the history of the Soviet Union and the conflicts on European ground during World War II, from the constant change in favoritism between USSR and Nazi Germany, to the dictatorial restrictions on the freedom of speech and thought. During Stalin’s government, the Soviet press was not allowed to discuss the changes in
loyalty, or discuss the past actions of the government. Meanwhile, the population was kept under constant fear by the NKVD, incriminating any individual who showed anti-soviet affections: its interrogations and inspections were kept secret and seemingly imaginary, and the individuals who were released could only be returned to their somewhat ordinary lives after signing an agreement that they would never speak of such arrests (Fitzpatrick).

In recent years, modern warfare tactics have seen the use of fear to affect the population psychologically, creating sensory overloads that upset body functions. In his book introduction, “Sonic Warfare: sound, affect, and the ecology of fear”, Steve Goodman narrates the effect of a sound-bomb air strike on the Gaza Strip in November 2005. The sound-bomb, although not technically an explosive, is the effect of sonic boom, “a high-volume and deep-frequency effect of low-flying jets travelling faster than the speed of sound.” The results were quite devastating, both on the affected site and on the population, which reported ear pain, nosebleeds, anxiety and panic attacks, hypertension and “shaking inside.” The government responded to the protests on the use of such devices by declaring that sound bombs were more desirable than lethal weapons: the objective was to weaken the morale of the population through “shock-and-awe” tactics, leaving a perceived sense of fear among the collectives (Goodman XIII).

With the spread of terrorism as a global incident, which in itself has constituted one of the greatest instruments of fear for centuries, many countries have translated fear into a perception instrument to grow political and cultural attitudes that harvest fear for manipulation of beliefs. This kind of instrument is obvious in the aim of conservative politics, which create unity through fictitious fear. In a recent study conducted by the Department of Political Science at Iowa University, Peter Hatemi has been investigating the connection between social fears towards out-groups in light of terrorist threats, and the association with conservative political parties. He highlights how conservatism becomes a secure platform to deal with the perception that the world is a dangerous place, offering intolerant and insensitive policies, which produce intraspecific unity, but only prolong the effects of fear (Hatemi et al 2). Such behaviors continue to be implemented to reinforce traditional ideologies, while fear persists to be exploited as tool to manipulate and to be labeled by a negativistic connotation.

These attitudes make for the social and cultural constructs that have shaped the growing contemporary concept of the culture of fear.
THE CULTURE OF FEAR

The culture of fear is simply an expression used to describe contemporary societies, where fear is the lens through which the external environment is perceived. This lens is a risk magnifying tool, which overemphasizes fear as an encompassing and controlling emotion; the consequence is a social and cultural construct that depicts the world to be in general a dangerous place to live in. In “A Philosophy of Fear”, Svendsen calls the current postmodernist society a risk culture, one that has become more aware of dangers and threats, determining a culture of fear that goes beyond risk assessment and management (Svendsen 12). Such risks are learnt through personal experiences, second-hand information and second-hand non experiences (Svendsen 48). He points the fingers to the absurdity of threats and fear management in Western-like societies, which have prominently shown an increase in the perception of certain risks, while the actual dangers are in fact decreasing (Svendsen 14).

Svendsen takes Ludwig Wittgenstein’s statement “the world of the happy man is different from that of the unhappy man” from Tractatus Logico-Philosophicus, and turns it into his own statement, “the world of the secure man is different from that of the fearful man” (Svendsen 12). By that, he suggests that the quality of life of safe people is constantly threatened by the frailty of their own existence, where fear has been cultivated as the one and only powerful act that can destroy their lives. Such fear is constantly present in the form of a low-intensity sensibility, capable of filling the collective mind with overwhelming images of destruction. The culture of fear is very prolific for the maintenance of traditions, but it perpetuates a stagnant view of the world, in which risk is worrisome to take and change becomes hard to pursue. Building upon the characteristics of the culture of fear mentioned in this section, I will propose in the second chapter an alternative methodology to re-imagine the omnipresent tension of fear.

“In brief, the world must thereby become quite another. It must so to speak wax or wane as a whole. The world of the happy is quite another than that of the unhappy.”

Ludwig Wittgenstein
Tractatus Logico-Philosophicus
CONTEMPORARY AND FICTIONAL THREATS

In his opening statement to "A Philosophy of Fear", Svendsen addresses airport security checks and the ridiculous behavior we engage in to enhance personal security, both increasing the sense of danger and awareness of fear: we are no longer talking about actual and imminent threats, but possible dangers that have the potential to disrupt our daily lives (Svendsen 17). Secure people live in this kind of culture, in which fear emphasizes the vulnerability of their essence: movies and television, news and newspapers, governments and economies employ fear for their prolific ends, creating a vast platform for imagining a future in which we apocalyptically end.

Distinguishably different from the causal-effectual kind of fear that is typical of the animal kingdom, the postmodernist culture of fear is notably emphasized by the proximity of mass media. In fact, the communication industry has gained the powerful ability to feed on and blow out of proportion the 'fear of' in order to build an economy for itself: newspapers and television programs make profit out of fear and perpetuate a one-sided view of the information that favors them (Svendsen 19). The reverse effect that such manipulation of information causes on society is the acknowledgement of threats and the admission of fear by promoting a universal acceptance without a personal investigation of sources. A phenomenon distinguishable on social media and other networking platforms, viral fear and false threats are often aggressively spread in matters of hours without a verification of sources. A beautiful and perhaps ironic example is the 1938 Orson Welles “War of the Worlds Broadcast”, which is significant for the terror it claims to have created throughout America, as well as for the exploitation of fear by mass media (see Appendix: Orson Welles and The Mercury Theatre on the Air).

The blame is not to be placed on mass media only. The reason why fear is so powerful is due to the emphasis we have placed on its antonyms as a society: we prefer order to disruption, we cultivate positivity, and we avoid negativity, we focus heavily on how to mass-produced the 'good' at the expenses of mending the 'bad'. These behaviors have resulted in the production of safety-enhancing tools, rather than analytical methodologies. By that, I mean that it has become easier to produce and market the 'best', the 'safest' and the 'most positive', neglecting the source of the opposition or questioning why there is a need for security.

Design is also responsible for the production of this consequential profit (see Appendix:

“...People go to cinemas, they see films of Nazi tortures, of mass-shootings, of underground conspiracy and self-sacrifice. They sigh, they shake their heads, some have a good cry. But they do not connect it with the realities of their normal plane of existence. It is Romance, it is Art, it is Those Higher Things, it is Church Latin. It does not click with reality. We live in a society of the Jekyll and Hyde pattern, magnified into gigantic proportions.

Arthur Koestler
SAFE: Design takes on risk). I quote, “Especially in everyday life, security is an industry in constant expansion, because, since there is no end to what could go wrong, there is also no end to the creative and commercial possibilities design can offer”, and “Good design, combined with good instinct, is our strongest assurance of progress toward a safer, more liveable world” (Svendsen 15). Architecture as well revolves around the function of protecting its users and inhabitants from external threats. However, these measures are relative. One one hand, the juxtaposition between safety and danger perpetuates the social and cultural dissonance that is at the origin of fear. To the contrary, it constructs the fictional risks and threats that re-imagine the negative connotation of the culture of fear.

“T

his was, however, not always the case to the same extent. There were periods and movements in history [...] when at least certain representative layers of society had attained a relatively high level of mental integration; times, when people seemed to rub their eyes and come awake, when their cosmic awareness seemed to expand, when they were “contemporaries” in a much broader and fuller sense; when the trivial and the cosmic planes seemed on the point of fusing.

Arthur Koestler

the source of threat today. A tool such as the Nukemap (see Appendix: Alex Wellerstein) would have been useful during the cold war and Svendsen himself, who states that he belonged to the generation that grew with the fear of a nuclear winter (Svendsen 18). According to a British survey, most 11-year-olds today are afraid of eco-disasters (Jones). Terrorists in the form of bombers, hackers and extremists are equally feared in today’s society.

Finally, fear and the culture it lives in influence each other. As stated above, fear is employed to influence and control a society towards a preferred attitude. Similarly, fear is moderated by newness: it is an evolutive mechanism, as much as an evolution in itself. What individuals were afraid of centuries ago is no longer

“D

esign and phobias

Design can have an impact on the culture of fear as a collective system, as well as an individual entity. In this regard, it can intervene on personal fears, where an insensitive public opinion has influenced the perspective of treatment, often branding with stigma those individual suffering of its consequences. In the earliest stages of this research, I incurred in the clinical perspective of fear. Typically referred to as phobias in clinical psychology, these disorders occur when a specific fear persists in the sufferer, who engages in a physical and mental reaction at the presence of a specific object or development of a situation. Due to the necessary avoidance
of such triggers, phobic reactions are considered memorable by the sufferer of the situation, and disproportional by the witnesses of the circumstance.

With 19.9% suffering of specific phobias, and gender-age heterogeneous percentages for multiple, animal and social phobias, these disorders are the most common forms of mental illnesses to affect individuals in North American and Europe (Fredrikson et al. 1). In light of their impact on society, phobias are treated by slow exposure to the object or situation of fear itself: cognitive behavioral therapy allows the phobia sufferers to challenge the beliefs and thoughts surrounding their fear, with the ultimate aim of helping them understand the irrationality of their fear (see Appendix: Dunne & Raby and Michael Anastassiades).

I decided to take one of the most common specific phobias, arachnophobia. A common argument suggests that humans are evolutionarily programmed to be afraid of certain animals, and that our human ancestors have genetically developed the ability over the evolutionary time line of mankind to react to dangerous animals, spiders and snakes in particulars (Pearson).

Although not all humans may be genetically susceptible to spiders, many of us are primed to become fearful, especially if we see others in the middle of a fearful reaction. Sympathy and therapy, therefore, become valuable and appropriate tools in the response to phobia attacks (Pearson).

I have questioned how design could intervene in the specific case of arachnophobia, which, due to its apparent evolutionary programme, emotionally affects many individuals across cultures. Keeping in mind the high-demand for arachnophobia treatment, I imagined how people fearing spiders could build up their individual systematic desensitization to their object of aversion, by gradually and customarily expose themselves to it. The ‘Arachnophobia Kit’ is
designed in four phases and it proposes a public, not-to-be-ashamed-of, perspective to the treatment of the fear of spiders. It was produced after interviewing some friends and acquaintances with mild cases of arachnophobia and analyze their behavior in the presence of a spider. The four designs are developed after several iterations of possibilities in the users ‘fight or flight’ response, providing them with the most practical resources in the case of a spider threat. The speculation of the use of such product is intentionally ideological.
.1 bubble

The first phase, .1 bubble, is specifically designed for individuals with the most invincible fear of spider. The design speculates that the user would neither flee, nor fight the spider, therefore leaving him/her with only one possibility: waiting for the spider to act. Ironically created for a long period of stay, the bubble is fully equipped for living inside just long enough for the spider to move on.

**Product description:** A fully impenetrable, water proof and claw-resistant plastic bubble to find shelter during your arachnophobia moments. The bubble is ready in just a few seconds and is fully impenetrable from the inside. Its round shape and anti-adherent material are sure to leave any spider scopula pads in disbelief!

**Content:** 1 water proof human bubble, water, snacks

.2 trap

Having experienced the presence of the spider from a protected area, the second phase of the arachnophobia kit offers slightly more exposure and bravery on part of the user. Provided with a defensive tool, the user is encouraged to throw the habitat cup over the spider from a desirable distance and to place a not for someone else to take care of the spider. By slowly approaching the cause of distress, one is invited to observe the spider and truly recognize its size, while acknowledging the safety of the action.

**Product description:** Why taking care of the disposal of the spider, when someone else can? Take the indestructible habitat cup and throw it on top of the spider to ensure its disarmament. The habitat cup is coated with a mild spider happiness potion that guarantees it will enjoy its waiting time! Now place one of the notes on top of the cup for someone else to discover, and rest assure no one will see that spider again!

**Content:** 1 habitat cup, 10 reusable notes
.3 spray

As one is moving forward, the third phase propose a fight response to the presence of a spider. Yet aiding one’s approach to the threat by using a freezing spray, this step encourages the user to take action and get rid of the spider. The extendable stick is imagined as a prop to be attached to one’s shoe or closest object, and be implemented as a crushing weapon or removal tool. The spray kit further emphasizes the most-likely-small size of the threat and prepares the user for the last phase in the treatment.

**Product description:** Freeze any spider’s potential for attack or escape from a short distance with the spray, and prepare yourself for the crash! Extend the slipper stick, hold tight on its end and approach the spider with uttermost bravery!

**Content:** 1 spray, 1 extendable slipper

.4 feed

The aim of cognitive behavioral therapy is to expose someone to their specific fear till they are fully capable to coexist with and to stop avoiding it. Similarly, the arachnophobia kit imagines that the progressive exposure to spiders will allow its users to ultimately act rationally in their presence. The last phase imagines that such behavioral improvement towards spiders will lead to a friendly relationship between human and animal. After identifying the spider type, one is invited to comfortably live near it, provide for its safety and feed it.

**Product description:** Feed and grow your spider easy and comfortably from your desk. The desk spider nest consists of a perfectly designed habitat for your spider to keep right by you at all times. Keep an eye on it and watch it become your next new pet!

**Content:** 1 desk spider nest, spider food
DESIGNER’S ROLE AND RESPONSIBILITY

Contemporary societies are based on norms that have shaped individual and collective, ethical and moral standards. Experience design reflects upon these social pillars, and approaches local and global challenges from a human-centered approach, discussing the ethical and moral consequences of its design implementations. When operating within these challenges, experience design, and design in general, must establish their role and responsibilities.

Considering the impact it has on societies, design holds an extraordinary capability to debate the current systemic models humanity works in, and to push mankind towards progress. I have always believed that design methodologies, through research, prototype, critic and iteration, have the power to redefine meaning, and to produce transformation. As a consequence, I regard designers as game changers and innovators with great responsibilities.

By debating issues, forecasting alternatives, and speculating outcomes, designers can rework the social parameters they operate within, questioning the meaning of instructions, and revisiting the structure of methodologies. In the latest book of Anthony Dunne and Fiona Raby, “Speculative Everything,” it is clearly stated in the introduction that, only by changing values, beliefs, attitudes and behaviors, societies can quit ‘being just hopeful,’ and begin envisioning again. Design’s continued inherent optimism has had a positive impact, but can no longer be applied to contemporary ‘wicked problems’ (Dunne and Raby 2). Thriving on imagination and introducing new perspectives, designers must become critics of reality, catalysts for speculation, revolutionaries of ideologies, and imagineers of political and economical systems. These are the roles and responsibilities we must carry.

This thesis is not designed to provide a specific solution to a problem; rather, it intends to open a discussion on the challenges that presently affect societies. To say that I am attempting to fix humanity would be a statement too great for the insignificant authority I hold in my community. However, I urge those individuals with such dominance to reflect upon their role and influence, redefining their standards and methods.

In light of this particular research and topic, I hold myself responsible for a debate on ethical and moral standards, design speculation, and practical application. As such, I intend to provide additional insight and new knowledge in the next chapters, moving towards a redefinition of fear, as a positive game changer in human relationships.
APPENDIX

CHAPTER 1: INSTRUMENT

SUPPORTING WORK

This appendix contains a collection of sources, annotations and inspiring works by other authors to support the writings presented in this chapter.

ADDITIONAL RESEARCH

Additionally, I reserve space for supplementary research information completed in the development of the thesis project.
DUNNE & RABY AND MICHAEL ANASTASSIADES

DESIGNS FOR FRAGILE PERSONALITIES IN ANXIOUS TIMES

Often as a society that operates on efficiency and functionality, we expect design to provide effective solutions. In Dunne & Raby’s collaboration with Michael Anastassiades, design takes a critical stand, placing irony on other disciplines’ research and popular views. The 2004-2005 series “Designs for Fragile Personalities in Anxious Times” explores the growing role of the culture of fear in our societies, and produces design solutions intended for individuals with phobias and paranoid behaviors. Borrowing from psychology’s popular treatment of phobias, the *Huggable Atomic Mushroom: Priscilla (37 Kilotons, Nevada 1957)* is designed for those individuals with a fear for nuclear explosions, and is proposed as a step-by-step solution that administers a small dose of exposure to the source of fear till one is gradually able to hug a gigantic soft atomic mushroom (Dunne and Raby 40). From the same series, *Hideaway Floor Furniture* is composed of three furniture versions that accommodate individuals with the fear of being abducted (Anastassiades and Dunne & Raby). These pieces are given much attention to details and are produced with high quality materials, provoking in its viewers and users conflicting feelings for what it is supposed to represent.

ALEX WELLERSTEIN

NUKEMAP AND NUKEMAP 3D

The product of a nuclear weapon historian, Nukemap is a project by Associate Professor Alex Wellerstein, who, using publicly available tools such as Google Maps and custom built Java Script, simulated the effects of nuclear explosions on earth (Wellerstein). The culture of fear certain society live in has created a general paranoia over nuclear weapons and atomic disasters, which often make headlines in newspaper and mass media platforms. Wellerstein argues that yet the majority of the population has a very bad sense of what impact an exploding nuclear weapon produces: thought of as a potentially global destructive event, nuclear explosions fill the imaginarium of our societies as both apocalyptic and dull incidents. The reality, he confirms, is found between the lines of these beliefs: nuclear explosions have the potential to cause immense destruction, but their effects are still comprehensible on a human scale (Wellerstein). The design of Nukemap developed as a tool to help visualize nuclear accidents through understandable measures and familiar means, such as location, scale, proximity and population. The results change based on location and the variable of kilotons of the device, allowing users to compare the impact of nuclear explosions throughout the world (Wellerstein). While demonstrating the impact of the culture of fear on human subconscious through the false propaganda of nuclear threats, Wellerstein addresses the ethical and political implications of making such a map: information on atomic explosions are already open source and the probabilities of a terrorist using such a map to gather results is unlikely (Wellerstein).

ORSON WELLES AND THE MERCURY THEATRE ON THE AIR

WAR OF THE WORLDS RADIO BROADCAST

At 8 p.m. on the night of Halloween of the year 1938, Orson Welles and the Mercury Theatre on the Air broadcast a special adaptation of H. G. Well’s novel *War of the Worlds* over the Columbia Broadcasting System radio network. Intended as a piece of dramatic and fictional storytelling, the 62 minutes broadcast simulated news bulletins, which recounted the Martian invasion of Earth as the aliens landed and attacked Grover’s Mills, New Jersey. The story, fictitiously narrated by actors and carefully pre-produced in the CBS studios, switched between the performance of “Ramon Raquello and His Orchestra” in New York City, the “Princeton Observatory” and the “Government Weather Bureau”, as the world is progressively coming to an end (Welles). The news bulletin simulation, which was announcing the landing of cylindrical spaceships the size of a football field, was the cause of an apparent widespread panic throughout America. At the time, the Mercury Theater on the Air ran without commercial breaks, which added to the realism of the story, and the news bulletin simulation apparently threw the listening audience in panic (Pooley and Socolow). According to the recounts of the AT&T telephone operators working at the switchboard on that 1938 night, the lights on the board started flickering as the story told of the crossing of the Martians over the Washington bridge (AT&T Operators Recall War of the Worlds Broadcast). In the attempt of connecting people over the telephone, the operators shared the fear and terror in the voices of Americans, who were trying to say goodbye one last time before the end (AT&T
Operators Recall War of the Worlds Broadcast.

The story is of particular interest in light of the mythical quality it gathered: the War of the Worlds Radio broadcast in fact never generated more than occasional panic (Pooley and Socolow). The New York Times, which addressed the broadcast ‘Terror by Radio’, “reproached radio officials for approving the interweaving of blood-curdling fiction with news flashes offered in exactly the manner that real news would have been given (Pooley and Socolow).” Nonetheless, this is a good example of the manipulation of emotions in the culture of fear as utilized by mass media to attract audience, generate imagination and produce collective empathy.

SAFE: DESIGN TAKES ON RISK

MOMA

Curated in 2005-2006 by Paola Antonelli for MoMA, the exhibition SAFE: Design Takes On Risk collected more than 300 contemporary products and prototypes designed to protect the body from dangerous circumstances and the mind from stressful situations, to respond to emergencies, and to provide a sense of comfort and safety (Antonelli). The exhibition investigates design products and architectural information, featuring, among different categories, refugee shelters, protective gear, medical equipment and everyday-life objects. These products debate the role of designers in providing protection, while promoting innovation, functionality and invention. It addresses the management of risk and threats in the global arena, and explores fundamental human fears, like darkness and loneliness, or disasters and terrorist attacks (Antonelli).

The exhibition catalogue states that “SAFE redirects the pursuit of beauty toward the appreciation of economy of function and technology,” while designers must “mediate between disruptive change and normalcy” providing solutions that undertake personal needs, protection and security (Antonelli).

JENNY BERGSTRÖM

GLOBAL TEMPERATURE CHANGE, AND THIS IS THE AIR WE BREATHE, 2007

In her graduate work at Konstfack, Jenny Bergström questioned how design could have an impact on fear, especially when we deal with complex information. Taking on difference case scenarios around the topic of global warming, she analyzed data and statistics to convert them into textile pieces. What she questioned in her thesis were the methods utilized for the fight against global warming; the apocalyptic stories that surround the most common behaviors have the reverse effect of making the public passive (Bergström 6).

Through her work, she intended to show the reality of the information in this age of big data. The most effective piece ‘This is the Air We Breathe…’ provides direct feedback of a phenomenon that is difficult to grasp in our day-to-day activities. Using flock printing to absorb the dark particles in pollution, she wrote a message that is clear to everyone and that slowly shows human impact on the environment (Bergström 14).
2 IMAGINATION

Imaginary Fear
Aesthetics and sublimity
Producing imagination

Appendix
IMAGINARY FEAR

Exploring the quantity and quality of fictional scenarios that fill the culture of fear, there is a possibility to prolifically utilize the continuous production of fear in our societies. In light of the historical negative stereotypes that have been emphasized in the previous chapter, I intend to open the conversation in this section for a more constructive view on fear and identify the opportunities design holds in harvesting imagination and speculation through its cultural presence and social misuse.

The earliest recollection of fear and imagination date as far back as Aristotle, who had identified the capacity of fear in the outset of the Peloponnesian War, which found the Athenians worried for the growing economic and social power of the Spartans. The speculation that one side felt for the other led to the inception of one of the longest belligerent historical events of Ancient Greece. Besides the economic factors that dominated the war stage, what sort of imminent threat did one side perceive in order to initiate the conflict? This fictional fear is the starting point of this short exploration of aesthetics, sublimity and the derived design intervention I speculate could be beneficial in the culture of fear.

AESTHETICS AND SUBLIMITY

A most important document, which established the aesthetic interpretations of biological phenomena, is Charles Darwin’s 1872 compendium of “The Expression of the Emotions in Man and Animals”. The book, written in fourteen chapters, categorizes human and animal emotions in complementary groups, which highlight the subtle similarities of intrinsic human experiences. Not coincidentally, Darwin classified the emotion of fear in the section titled “Surprise - Astonishment - Fear - Horror”, exploring the mechanisms that transform surprise into fear and horror into astonishment. Paying particular attention to the physiological reactions of the individuals he observed, Darwin was able to collect identical feedback in threatening and astonishing situations, which in his opinion proved the connection between these two behaviors, as well as the universality of emotions in humans (Darwin 295).

By placing fear and astonishment in the same chapter, Darwin traced a significant
anthropological and esthetical resemblance between these two attitudes (Darwin 307). He illustrated the remarkable similarities between the facial expression revealed during an experience of wonder and one of terror:

“Attention, if sudden and close, graduates into surprise; and this into astonishment; and this into stupefied amazement. The latter frame of mind is closely akin to terror” (Darwin 278).

And:

“Nevertheless, it is probable that many or most of the above symptoms of terror, such as the beating of the heart, the trembling of the muscles, cold perspiration, & c., are in large part directly due to the disturbed or interrupted transmission of nerve-force from the cerebrospinal system to various parts of the body, owing to the mind being so powerfully affected” (Darwin 308).

Darwin’s anthropological illustrations are a remarkable proof of the connection between the forceful physiological reactions and the powerful psychological effects of fear, which had only been dialectically explored through the philosophy of aesthetics a century before the Darwinian evolutionary theories. In the 1757 essay “A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful”, Edmund Burke categorized fear and terror as appropriating sentiments, opening his paragraph on terror by saying that “no passion so effectually robs the mind of all its powers of acting and reasoning as fear” (A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful 517). Burke’s theoretical analysis of the sentiments around fear and the passions of the mind are remarkable ideologies in the context of moral philosophy and ethics for the time, which form with John Locke’s and Adam Smith’s writings the complex dialogue of empiricism. Within this formulation of theories, Burke traced the etymology of the words terror and wonder, to delineate the semantic development between fear and imagination. He stated:

“No passion so effectually robs the mind of all its powers of acting and reasoning as fear. For fear being an apprehension of pain or death, it operates in a manner that resembles actual pain.”

Edmund Burke

“Several languages bear a strong testimony to the affinity of these ideas. They frequently use the same word to signify indifferently the modes of astonishment or admiration and those of terror. Θάμβος is in Greek either fear or wonder; (...) αἰδέο to reverence or
to fear. *Vereor* in Latin is what *αἰδέο* is in Greek. The Romans used the verb *stupeo*, a term which strongly marks the state of an astonished mind, to express the effect either of simple fear, or of astonishment; the word *attonitus* (thunderstruck) is equally expressive of the alliance of these ideas; and do not the French *étonnement*, and the English astonishment and amazement, point out as clearly the kindred emotions which attend fear and wonder” (Burke’s Writing and Speeches)?

Semantically, there exists a significant connection in the etymology of the words fear and wonder; one that can be used at the advantage of this research in exploring a forward-looking alternative to the use of fear, imploring that this one could in fact be more adaptable and meaningful to human existence. It is true also that fear is naturally connected to curiosity: biochemically, humans are attracted to experiences of fear because of their charm (Svendsen 74). This is also reflected in the behavior that drives or follows fear itself, as a person would typically strive to find out the cause of a certain effect, even through the most terrifying of circumstances. Svendsen reiterates that “there is without a doubt something delightful about being terrified almost out of one’s wits”, and this is particularly true of storytelling, which has used fear, terror and horror to attract even the most indifferent of audiences.

The reason for this had been identified as far back as 1 BCE and redefined in Burke’s writings as the Sublime, or the physical, moral, aesthetic, spiritual and artistic quality of greatness. In his definition, the Sublime is any sort of sentiment that excites terror, fear, pain and death in a pleasurable manner, which overwhelsms the mind, but keeps safe in the knowledge that it will not harm the body (A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful 517).

What can be derived from this pleasurable and distanced experience of fear is the knowledge of security, one that allows the mind to wonder freely in the immensity of one’s imagination. Immanuel Kant specifically addresses this sublimity in the power of reason and the mathematical sublime, in which the human mind overcomes fear itself and gains awareness of it elevation:

“The astonishment amounting almost to terror, the awe and thrill of the devout feeling, that takes hold of one... is not actual fear. Rather is it an attempt to gain access to it through imagination, for the purpose of feeling the might of this faculty in combining the movement of the mind thereby aroused with serenity” (Kant).

In other words, the Sublime for Kant only appears when fear is under control. The same can be said about the quality of this emotion in the culture of fear, where it is not a heightened experience, but rather a low-intensity and frequently present one. Therefore, if in the culture of fear, the object of fear itself is overcome, then could we use such sublimity to translate fear into a habitual production of imagination?
PRODUCING IMAGINATION

The culture of fear is heavy in imagination: living in a society that is safer than ever, we imagine the intensity of possible dangers, and create the context for new threats. Terrorism and global warming, vaccines and cosmetics, chemical wars and viral attacks are lurking in the darkness of our futures, and our imagination plays a central role in the production of possible threats. This statement can be reversed, articulating it the other way around: fear can propel imagination, by forcing a speculation of possible futures (see Appendix: Karen Thompson Walker).

Such production of imagination finds justification in the human mind. Gifted with the faculties of anticipation and aggregation, humans can envision threats and extrapolate fear, before they materialize, if ever. The fundamental importance of imagination during an experience of fear lays in the space for envisioning the “What if”. By “What if,” I suggest the frame of thinking in which anything is possible: imagination is an intangible location in which our physiological shell finds itself free of obstacles. It is a space that allows us to decipher physical information and transform it into powerful narratives. The human mind has always had this powerful ability: data is input, and meaning is output.

In his essay “The Pleasures of the Imagination”, Joseph Addison places imagination in a mid-point between the gratification of the senses, and the rationale of the understanding, where it becomes a dominant element of both empathy and interpretation (Addison 382). During an experience of fear, when one’s senses accelerate through the biological responses of the threat, imagination offers a pleasing escape route. In the instance of a fictional threat, however, imagination provides insight and produces new knowledge.

If on one hand, there are many disciplines and professions that harvest paranoia for the production of a risk-assessed socioeconomic environment, it is also true that imagination in a protected-from-fear situation can generate infinite possibilities. This constructive paranoid behavior can be used to manage risk and prevent unwanted outcomes, but also turn fear into innovation. A practical exercise can be achieved through the application of a reductio ad absurdum methodology, in which the most ridiculous of worries evolves into an equally absurd conclusion. Through such practice, design can utilize public anxiety to speculate alternatives, idealize functions, and prototype concepts (see Appendix: Dougal Dixon).

In the attempt to find a prolific application of non-threatening fears, I propose to utilize social media and other public platforms as spaces to crowd source collective sentiments of worry. By doing so, design and other disciplines can begin generating imagined scenarios that promote more sustainable futures.

“Our fears are an amazing gift of the imagination... a way of glimpsing what might be the future when there’s still time to influence how that future will play out.

Karen Thompson Walker
This appendix contains a collection of sources, annotations and inspiring works by other authors to support the writings presented in this chapter.

Additionally, I reserve space for supplementary research information completed in the development of the thesis project.
**KAREN THOMPSON WALKER**

**WHAT FEAR CAN TEACH US, TEDGLOBAL, JUNE 2012**

In November 1820, twenty American sailors stood on three whaleboats watching their beloved whale ship, the Essex, sinking into the water. The ship had just been attacked by a sperm whale in the middle of the Southern Pacific Ocean, more than 3000 kilometers off the coast of Chile, leaving its crew with limited food and water supplies, rudimentary navigation tools, and a long journey ahead to reach land. The survivors began debating which way to go: according to the accounts of the survivors, the captain of the Essex opted to go West in order to reach the closest ground, the Marquesas Islands. This idea was quickly abandoned, as some had heard rumors of cannibalism, which in the minds of these sailors was the most fearful consequence of all. Eventually, the three boats parted and each went on their way, with some men navigating towards Henderson Island in the Pitcairn complex, and some towards the coast of South America. Overwhelmed by the terrors of cannibalism, these men sailed for thousands of kilometers imagining the potential of a better outcome (Fear & the Imagination). As Karen Thompson Walker narrates in her TEDtalk, these men made a decision, driven by their own fears: cannibals, storms, or death (What Fear Can Teach Us). In light of the whale ship Essex history, she proposes that fears are an intrinsic part of our imagination: they are similar to stories in that they have a plot and a protagonist, but above all they make us think about the future (What Fear Can Teach Us). She states “fears are an amazing gift of the imagination, a form of everyday clairvoyance, a way of glimpsing what might be the future when there’s still time to influence how that future will play out” (What Fear Can Teach Us). When interpreted properly, fears can provide wisdom, insight and what she calls “a version of that most elusive thing, the truth” (Fear & the Imagination).

**DOUGAL DIXON**

**AFTER MAN: A ZOOLOGY OF THE FUTURE, 1998**

Illustrator Dougal Dixon explores the aesthetics of earth after mankind has suffered extinction. Focusing on biology and meteorology, he divided the world into six regions, in which new animals and environments have evolved (Dunne and Raby 76). Our post-apocalyptic home planet is now home to wingless bats and flower look-alike creatures, which stun their preys in a human-free environment. This future scenarios proposes a fear-provoking outcome to today’s global anxieties, illustrating a biological evolution that is stimulated by fear-based speculation and imagination.
EVOLUTION

What is fear?
How fear works
Functionality and responsibility
Animal instincts
Human adaptations

Appendix
WHAT IS FEAR?

In short, fear is an emotion. Specifically, it is categorized as one of the basic human emotions, which along with anger, disgust, happiness, sadness and surprise form the intrinsic biological mechanisms of human experience.

Fear exists in both humans and animals, and functions as a protective emotion: intended to heighten the senses and to prepare for the so-called fight-or-flight response, fear is considered an outstanding survival mechanism with superhero-like functionality.

“Among these emotions there is one, very widespread in the animal kingdom, [...], very important to the welfare of the animal, and typical of the suggestive conceptions resulting from the positing of a comparative and a physiological point of view - the emotion of fear.” (The Psychology of Fear 351)

HOW FEAR WORKS

As a chain reaction initiated by an outer stimulus, fear is a cause-effect mechanism that involves the senses as instruments of perception, the brain as an apparatus of interpretation and the body as a machine for response.

When an external stimulus engages one’s senses, the process of fear is started in the brain and can take two forms: the low or the high road (Layton).

THE LOW ROAD

In the low road, one is simply reacting to a stimulus, taking the immediate fight-or-flight response. For instance, as one is walking at night and a loud noise behind engages one’s space, the low-road process alarms the person of the possibility of an attack by an unknown source. The objective of the low road is to initiate a response without asking questions and push the sensory data through a fast brain reaction.

The first to receive the information is the thalamus, which, uncertain of the nature of the danger signal,
automatically bypass the other sections and informs the amygdala to take action. The neural impulses are transmitted to the hypothalamus, which initiates the fight-or-flight response in order to protect one from danger (Layton).

**THE HIGH ROAD**

What makes the difference between the low and the high road is the parts involved in the process and the amount of information considered. The high road is an analytical process that “contemplates” information and weighs options in order to provide the most proper response to a stimulus.

Taking the example used in the previous low road description, when one is engaged by a loud rear noise, the high road process takes the sensory data and passes them to the thalamus. The information are processed and sent to sensory cortex, rather than directly to the amygdala: the sensory cortex in fact is responsible for interpreting meaning, determining the various potential meanings around the external stimulus. In collaboration with the hippocampus, the information acquired till this point is analyzed for context. Memory is used to understand whether such sensory data had been met during another instance and what particularly happened. Additionally, the hippocampus analyzes what else is happening around by engaging the other senses in order to understand what could have been the cause of the noise: in other words, the hippocampus is responsible for determining if the noise was the source of a plausible attack or something falling on the ground.

If the hippocampus realizes that there is no actual threat, it will communicate to the amygdala to shut down the response. If there is a danger, the hippocampus will however warn the amygdala, which in turn is responsible with the hypothalamus for initiating the fight-or-flight response.

The low road is applied imperceptibly. The high road on the other hand takes longer, and is expressed in those moments of terror before further action is taken (Layton).
FUNCTIONALITY AND RESPONSIBILITY

In the same way as other emotions and processes in nature, fear has evolved and continues to evolve in order to fulfill specific evolutionary functions. The complex system of fear operates holistically and infinitesimally: it combines smell inputs, hearing reception, physiological reactions and responsive expressions that create a defensive individual strategy, and an alarming collective system.

Both among animals and plants, as well as in humans, fear is one of the quickest and most intense experiences, in terms of heightening of the senses, of bodily feelings, and of postliminary memories. From the quickening of the heart beat and involuntary muscular trembling, to the paleness of the skin, cold exudation and dryness of the mouth, fear is integral to many species’ ability to survive (Darwin). Its specific survival functionality is matched by its experiential responsibility. By that, I refer to the experiences learnt through the bodily effects, which will be further examined in the last chapter.

ANIMAL INSTINCTS

In nature alone, there are various examples of the adaptive and protective responsibilities of fear in animals: the Eurasian rollers has, since the discovery of its alarm system, been praised for its sticky orange vomit, which functions as a warning signal for other birds of an incoming threat; similarly, minnows with their oozing of bodily substances into the water prompting other minnows in the vicinity to immediately leave the site (Angier). Such process, known in nature as the ‘smell of fear’, is not simply a mechanism for animal species, but for plants as well: alarm signals are released through air and soil, which scientists have been able to translate as evidence of vegetal despair (Angier).

The discovery of the smell of fear and the powerful olfactory apparatus in species like birds is considered a research breakthrough in this field, opening the opportunities for other groups, including humans, to develop a sensibility to fear, or schreckstoff.
Called *Schreckstoff*, after Austrian honeybee researcher Karl von Frisch’s discovery in 1937, the alarm signal mechanism of animals is the result of a chemical communication among members of the same species. The chemical compound responsible for this phenomenon is hypoxanthine-3N-oxide ($H_3NO$), or chondroitin sulfate (Wilcox). For the sake of a human analogy, the smell of fear is hypothesized to be somewhat ‘sweet’.

*Schreckstoff* can be interpreted in two ways. It is a defensive mechanism with the purpose of frightening a near-by predator. There is a well-known escape mechanism in nature, found specifically in the members of the cephalopod species: squids and octopi. These are able to release a dark ink-like solution that creates an escape route, by obscuring a predator’s vision for a short period of time. Some experiments have shown the possibility that such ink can also numb and irritate a predator, creating a unique defensive mechanism.

The other responsibility of *Schreckstoff* lays in a collective alarm system, capable of communicating with others through pheromones. Taking the example of fathead minnows schools, when one of them is injured by a predator, it will release $H_3NO$ in the water, warning other minnows to escape. Another case is found in plants, where one species warns the neighboring ones through the release of volatile chemical signals that it is injured or infested. Accordingly, the recipients activate their defense mechanisms by decreasing their vulnerability or attracting benevolent mites.

*Schreckstoff*, or scary/fright stuff, is the chemical alarm system of animals ($H_3NO$).

**PROGRAMMING**

Perhaps one of the most interesting aspects to observe in animals during the presence of a threat is their behavior. From an extra-species perspective, it looks like they all at once acquire a collective understanding of what is happening, where the threat is, and how to proceed to maximize utility. This is a characteristic that seems to lack among humans when panic disrupts the ordinariness of a day.

Such animal behavior finds an answer in their evolution, where for generations they acquired new information and rewrote their genetic program to maximize their survival. Whereas the environments in which most animal species operate is far less complicated than the one humans populate, their rationale and programmed behavior in the instance of fear is a quality to explore.
HEIGHTENED SENSES

The fiction surrounding the powerlessness of human beings emerges from the realization that our bodily capabilities are limited in comparison to other species. It comes with no surprise that we created superheroes, human-like individuals who possess acute hearing, superb vision, sensational strength, and incredible skin mutation. Fiction writers have looked at non-human species to combine their most outstanding characteristics with our senses.

It is true that animals have certain qualities that become most powerful during fear. The already mentioned olfactory system, better night vision, and low-frequency sensors are just some of the capabilities animals possess, which human can explore for innovative transformations.

HUMAN ADAPTATIONS

What humans can learn from nature in terms of adjusting their behaviors during fear is more than a discussion on biophilia and biomimicry. When imitating the way animals have adapted and evolved by means of developing acuter senses and better instincts, mankind can turn the discussion into innovation and progress. Translated in terms of human evolution, such adaptations fall within technology and transhumanism.

In the previous section, I highlighted some behaviors that animals employ in order to prevent an attack, defend themselves and communicate to others the presence of a threat. Researchers have been analyzing these behaviors in humans to understand which new possibilities could be applied for our species’ evolution. Whereas the ‘smell of fear’ used by animals may seem a fictional thought for our species, the human olfactory system has more access to information in the environment surrounding us than we believe. The ability of recognizing a good perfume from a bad odor is just one and the most applied function of our nose, but research shows that it is capable of much more. In her work on smells, Norwegian artist and smell researcher Sissel Tolaas explains how the human olfactory bulb is linked to the limbic system, a complex set of brain and neural structures, responsible for a variety of functions, from one’s emotional life and behaviors, to motivation and the formation of memories (Tolaas). In her collaboration with M.I.T., she explored the possibilities for the human body to secrete alarm pheromones, and for the olfactory and limbic system to process the smell of fear (see Appendix: Sissel Tolaas). The exhibition Tolaas created at the end of her research allowed the visitors to explore their sense of smell, and to analyze the alarm system of others: although the smell was not identified as fear, some say they experienced a sense of discomfort and anxiety within the space (Ngowi).
These distressing behaviors in the presence of fearful smells have been confirmed by other studies: in 2009, a team of German researchers collected sweat from people waiting to give an oral presentation. Then, they connected a different group of participants to MRI scanners and asked them to smell the scented air containing the fearful sweat compounds. Although the participants could not recognize what the smell was, the MRI scans reported increased brain activity in the limbic areas involved with empathy processes and social signals. The survey suggested that the nervous sweat, containing the chemical compounds of anxiety, triggered a response in the smellers’ brains, without the typical manifestation of the more apparent experience of smell (Prehn-Kristensen et al.). Similarly, Zhou and Chen at Rice University conducted a study with chemical sweat compounds focusing on facial expressions. Their findings provided behavioral evidence that human sweat contains emotional meanings, suggesting that, even though humans rely primarily on sight and hearing, smell does contribute to provide certainty (Zhou and Chen).

One of the strengths in animals is perhaps the seemingly rational behavior that follows a threat. This rationality is explored in the chemical mixture that produces fear itself. Interaction designer Kevin Grennan analyzed this rationality in human-robot relationships, claiming that the scent of fear could enhance concentration and performance (see Appendix: Kevin Grennan). In his scenario, the rationality in the chemistry of fear could effectively allow humans to differentiate between dangerous situations and false alarms. Such capability could turn out to be useful in public situations where panic spreads quickly.

**TRANSHUMANS**

The aim of this chapter has been to explore the bodily experiences manifesting during fear, and to understand where design could intervene in person-to-person interactions, changing the public view of fear and utilize its core function. When it comes to human adaptations, I found an opportunity to merge the positive aspects of fear as seen in non-human species with transhumanism and wearable technology, applying them to contemporary issues.

There are no limits to the possibilities that such exploration could offer (see Appendix: Human Adaptations). When looking into the positive characteristics of fear as observed in animals, the most significant quality is the heightening of the senses. Visual, auditory, tactile and olfactory cues are interpreted infinitesimally to understand a threat and pursue a response.

The ordinariness of human senses are reviewed in this design concept, which enhances the auditory, visual and tactile systems by providing immediate feedback to the surrounding environment. The prototype includes a wearable device and a smart phone application.

The wearable device consists of 5 finger pieces that contain an area microphone and
Bluetooth technology. It is imagined to be most useful when moving around, both in urban and rural areas, but it can be adjusted to any situation. The finger pieces can be set up to pick up auditory data for a chosen distance radius, and to interrupt the individual wearing them, by enhancing sound through headphones or vibration on the hands. The wearable device communicates to the smartphone application in order to save and analyze the sensory information, by matching the specific sound with the ones in the database. Once the sound is matched, the application can be used to locate its origin. The design concept is imagined to serve mainly two functions: firstly, to offer an enhanced sensorial experience when a stimuli enters one’s space; and, secondly, to empower an individual flight route, or a collective fight intervention.
Image 8. Smart phone application and finger device prototype: sound is picked up by the fingers.

In the same way that animals behave in the presence of a threat, a person can make an assessment of the surrounding environment, by picking up stimuli and creating a valid response. The individual flight scenario sees a person moving through space and be interrupted by an enhanced sudden sound. For the purpose of this narrative, the auditory data matches an incoming drone strike. After analyzing the information, the application shows a map with the origin of the sound, offering an alternative escape route. In this case, the function of this technology corresponds to that of the low road in fear, which offers a quick solution to an impeding stimuli.

The other function of the concept seeks an intervention, rather than a defense mechanism. This second scenario breaks into a person’s space by enhancing the sound coming from another individual. Similar to the communicative pheromones of animals observed earlier, this design concepts picks up the alarm system of someone else nearby. The sound is enhanced and analyzed
Polinedrio.

Evolution

Image 11. Smart phone application prototype in use: sound is enhanced and sent to smart phone.

Image 12. Smart phone application prototype in use: audio data is analyzed through the database for matching.
through the database to identify it, for the purpose of this narrative, as a female scream. The smart phone application shows the quickest route to the origin of the sound, while the finger pieces intensify the vibration the further away a person goes from the alarm. In this instance, the wearable technology is imagined to enhance the needs of others, resisting the infamous bystander effect and asking for a collective intervention upon an external request.

The hope of this design concept is to promote a behavior that is more fit for the circumstances one is surrounded by. The application is envisioned to fill the gap of our human weaknesses, making a progressive impact on our reactions and responses to a situation. As wearable technology is making a greater social and cultural impact, design can focus on intervening where there is a lack of pragmatism, expecting a future that finds mankind more adaptable and sensible to its surrounding realities.
Image 14. Smart phone application prototype in use: an audio match is found.

Image 15. Smart phone application prototype in use: audio is located and a map is provided to find the source.
APPENDIX

CHAPTER 3: EVOLUTION

SUPPORTING WORK

This appendix contains a collection of sources, annotations and inspiring works by other authors to support the writings presented in this chapter.

ADDITIONAL RESEARCH

Additionally, I reserve space for supplementary research information completed in the development of the thesis project.
SISSEL TOLAAS

THE FEAR OF SMELL - THE SMELL OF FEAR

Animals have been held in high regards when it comes to their natural super powers. When it comes to fear, research suggests that they produce and detect in-species alarm signals, which allows them to communicate with other members of their group during a dangerous situation. This is the so-called Shreckstoff, or the smell of fear.

Do humans have the nose for fear? The research on smell and the human olfactory system of Norwegian researcher Sissel Tolaas questioned if humans could produce and identify fear, and began to explore the possibility for fear to possess a recognizable and distinctive smell. In her investigation on the ‘smell of fear’ conducted with M.I.T., she evaluated the sense of smell as one capable to communicate different moods, and explored how the body could use adapting physiological changes to communicate such conditions (Aditi).

In collaboration with M.I.T. for 2006 the exhibition titled “The Fear of Smell - The Smell of Fear”, Tolaas took samples of sweat from nine individuals after their experiences of fear-induced stimuli. She analyzed the specimens, isolating the components of smell in order to synthesize the fearful sweats into the equivalent chemical replicas (Aditi). The processed fear chemicals were then mixed with paint through micro-encapsulation technology, allowing for them to be directly rolled on the walls of the gallery (Tolaas). The experiences of the thousands of visitors of the gallery were very subjective, from some feeling unbearably overwhelmed to continue through the exhibition, to others engaging with the intimacy of the newly discovered sense (Aditi). However, most interesting was the biological and neural response of the participants of the social experiment: the smell may have not been identified with fear, but some say to have experienced a sense of discomfort and anxiety within the space (Ngowi). Tolaas has extensive understanding of smell as a sense, and has been working with smells from the start of her career. She explains how the human olfactory bulb is linked to the limbic system, a complex set of brain and neural structures, responsible for a variety of functions, from one’s emotional life and behaviors, to motivation and the formation of memories (DiCarlo).

KEVIN GRENANN

PROTOTYPE ROBOT ARMPIT

Investigating the relationship between humans and robots, interaction designer Kevin Grennan questioned the future of empathy between these two groups. In his “Prototype Robot Armpit”, he took industrial Japanese sweat that emulates the scent of human fear and dispensed it through a robotic armpit, equipped with synthetic flesh, glands and hair (Connelly). His argument against the aesthetic anthropomorphism of robots is made clear in the armpit design, which sustains his claim that empathizing with human look-alike machines is dangerous in the wake of technological advancements in robotics (Connelly).

Fear and the pheromonal contents in its formula are known to increase cognitive performance and concentration, and it is in subtle communicative forms, such the one through the olfactory system, that Grennan believes humans could potentially develop subconscious and more realistic reactions (Connelly).

THE SMELL OF CONTROL: TRUST, FOCUS AND FEAR

Within the same subject of human-robotic relationships and the evolution of empathy, Grennan explored the subconscious properties of trust, focus and fear in chemicals dispensed by machines and inhaled through the human olfactory system (Dunne and Raby, 62). In “Trust”, he equipped a surgical robotic arm with oxytocin, the molecule of trust and morality; before a medical operation, the machine sprays the patient with the hormone, and waits for the human to progressively develop a trusting relationship with the machine (Dunne and Raby, 63). In “Focus”, Grennan used androstadienone to increase the productivity of females in a production line: his picker robot releases the chemical compound to improve performance in the vicinity (Connelly). In “Fear”, a bomb-disposal robot discharges the scent of fear with the objective of enhancing concentration and effectively differentiate between dangerous situations and false alarms (Dunne and Raby 62; Connelly).

Pointing to science fiction and social paranoia that enhanced the fear of robots taking over the world, Grennan created a speculative future that offers a pessimistic view of the evolution of human-machine relationships (Dunne and Raby 62). Nonetheless, the scent of fear is explored as an added human capability for cognitive enhancement and intelligent performance, while empathy remains a critical point of human evolution.

(Aditi)
HUMAN ADAPTATIONS

There are no limits to the design possibilities we could produce when merging biomimicry, biophilia, transhumanism and wearable technology. This space is dedicated to the quick sketches and prototypes that hypothesize an improved use of fear in human beings. These concepts are imagined as added features for a future in which humans will reinvent their senses and capabilities, and will be able to fully access the data in their environment.

ADDED SENSORY ABILITIES

Human sensory spaces are well established, with specific system serving specific functions. In the early stages of this design speculation, biomimicry and biophilia observed the way in which other species sense data in the environment. Paying attention to ants and other bugs capable of tasting fear through their limbs, this design proposes a genetic manipulation of our sense of taste to expand its detection beyond the gustatory space.

INTER-SPECIES COMMUNICATION

Global threats have become larger and more complex to comprehend, as we lack the physical and direct proof of their impact. This design proposal suggests an aided relationship with plants, where we can begin to understand each other’s role in the issue of global warming. Using plants intra-species communication, with which they communicate among one another, we can translate their transmission in a physical language we can understand as well. This speculation uses somatosensory and auditory data to translate the physical condition of a house plant, but it could be imagined in larger context (such as a forest), using other sensory spaces.
LOW FREQUENCY DETECTION

Some animals are believed to perceive threats in advance, engaging in behaviors that we as humans cannot comprehend, due to our inability to detect certain environmental clues. Low-frequencies, occurring during earthquakes, are some of these environmental clues, which humans cannot recognize. Wearable technology looks at the way other species, including dogs, transform these information into an early discovery of risks, in order to prepare for a threat in the right time.

This design sketch proposes shoes as a tool for the detection of low-frequency from the ground, turning these imperceptible vibrations into a signal we can understand.

INTRA-SPECIES COMMUNICATION

In the pursuit of empathy, which will be addressed in the next chapter, humans could develop new ways to communicate one another their inner state of being. Currently, we can detect emotions based on facial and bodily expressions, as well as spoken direct language. What if we were able to read each others physiological conditions in order to detect such state of being?

This interface proposes a personal point of view when looking into another being, allowing technology to detect for us the actual physical condition of another individual. In line with other species ability to communicate by means of bodily sensory data, this design prototypes speculates on new ways to communicate within our species through the use of wearable technology.
4

EMPATHY

Biological information
Communicating the hidden
The value of human emotions
Empathy or apathy?
The role of empathy in humanity
Monetary and philanthropic empathy
Sensory spaces
The experience of fear
Collective sharing

Appendix
BIOLOGICAL INFORMATION

In 1872, Darwin published his book “The Expression of the Emotions in Man and Animals,” a long awaited compendium of his findings on the genetically determined characteristics of behaviors in humans and other species (Darwin 290).

Regarding the subject of fear, he describes the physiological reactions consequent to the exposure of a threat, detailing all of the stages from the quickening of the heart beat and involuntary muscular trembling, to the paleness of the skin, cold exudation and dryness of the mouth (Darwin 290). The descriptions and illustrations that Darwin gathered for his chapter on fear extensively analyze an emotion that is an integral part of mankind: when overcome by the presence of a threat, our body initiates a process of feelings and sensory awareness that is common of all people.

Whereas many argue the cultural and linguistic diversity of emotions, defining them as the most subjective of human phenomena, a Finnish study has highlighted their sensory universality. In the same way that Darwin collected and confirmed the similarities in the bodily reactions of different individuals and animals, this recent collaborations points to the biological response accuracy and ubiquity of specific feelings during a certain emotional experience (Nummenmaa et al. 1). The study, which analyzed basic (anger, fear, disgust, happiness, sadness, surprise) and non-basic (anxiety, love, depression, contempt, pride, shame, envy) emotions, identified a biological foundation for emotional experience. This finding is of fundamental importance in the debate that tries to place emotions as congruent universal experiences. A topographical self-report tool was used to measure the bodily location of the six basic human emotions in different linguistic groups, leading to the conclusion that each embodied emotion finds a topography-specific sensation, shared in similar ways across multiple individuals. In particular, when analyzing fear, the emotion seems to be elevated in the core and upper portion of the body, within the rib cage, around the shoulder and head. These findings correspond to the likely biological response triggered during fear, which consists of the quickening of the heart beat, fast breathing connected to hyperventilation, the involuntary muscular trembling and the uncontrollable changes in the facial expressions.

Indeed, there is a peculiarity in our emotions that connects us as humans. Such idiosyncrasy lays in the biological and sensory occurrences that shape and differentiate each human emotion. Fear, in the same way as anger, happiness or sadness, feels a specific way, which is unique to its condition.

In this final section, I will conclude my research focusing on the sensations that occur during an experience of fear in the human body. After rectifying the perspective of fear through a design exploration of new social possibilities, I will demonstrate how fear holds the key to understanding our own humanity. By externalizing its hidden physiology, I will justify the obligation to experience fear before condoning its application.

“No suffering is greater than that from extreme fear or horror.”

Charles Darwin
COMMUNICATING THE HIDDEN

When Locke published “An Essay Concerning Human Understanding” in 1689, he fought British empiricism to promote the influential significance of human subjectivism as the most fundamental knowledge, insisting that innate human sensations contribute to forming accidental experiences that produce understanding (Locke 365). It is in the instinctual and intrinsic mechanisms of human Reason that Ideas are associated to produce involuntary and inexplicable understanding, one that according to Locke is delivered by chance and is different for every individual (Locke 365). In Locke’s essay, it is important to gather the fundamentals of subjectivism, which lead to the importance of sensory informations and emotions as foundations of knowledge.

The peculiarity of human emotions exists in their secrecy. Communicating the internal happenings of our body is rather difficult. As a species, we have developed external cues that reveal a particular process as it is occurring in our body, such as blushing or shivering. As intelligent beings, we have learnt to communicate our feelings and emotions, through common behaviors or other forms of intellectual kind. Yet in the brisk circumstances and special context that emotions manifest themselves in, we misinterpret their meaning.

The complexity of human interactions often coincides with a misunderstanding of emotions. Fear especially can be taken for surprise or wonder, as it was highlighted in the chapter on imagination. Similarly, it can be wrongfully interpreted for aggression or anger (Svendsen 24). Where there is a fair distinction mediated by social norms, there exist biological and physiological aspects of fear that are unmistakable. These comprise the sensory data that create the experience of fear, such as the quickening of the heart, acceleration of breathing, shivering and loss of balance, to name a few. By externalizing the most intrinsic processes of fear, there is a possibility to demonstrate its universal discomfort, opening the conversation for a more constructive understanding among individuals, and pointing to the altogether fallacy of human emotions.

“They don’t believe in concentration camps, they don’t believe in the starved children of Greece, in the shot hostages of France, in the mass-graves of Poland; they have never heard of Lidice, Treblinka or Belzec; you can convince them for an hour, then they shake themselves, their mental self-defence begins to work and in a week the shrug of incredulity has returned like a reflex temporarily weakened by a shock.”

Arthur Koestler

THE VALUE OF HUMAN EMOTIONS

An emotion is a phenomenon, consisting of a physiological experience and a cognitive interpretation (Svenden 21). The process of an emotion is considered both physical and mental.
Empathy is a phenomenon of interests for many disciplines, experience design included. It is generally recognized as the ability to experience the emotions of another being, bridging the gap between the self and the other (Klein J.K. 438).

In opposition to empathy, there is apathy, which is commonly defined as a lack of emotional concern or interest. A search for the definition of apathy often returns negativistic results, such as ‘the opposite of love’, ‘tyranny’ and ‘the worst of evils.’

Both empathy and apathy are contingent upon experience and context. Whereas empathy is praised for its ability to enter a situation by vicariously experiencing the feelings of others, apathy is fundamental to detach the physical self in overwhelming circumstances. The risk of overplaying an apathetic attitude, however, lays in a progressive desensitization of experience,
But at the same time they lamentably failed to imbue the people with anything approaching a full awareness of what it was all about, of the grandeur and horror of the time into which they were born.

Arthur Koestler

which in the context of fear leads to the inevitable insensitivity that takes away meaning during its application. By that, I refer to the lack of shock and discomfort that occurs during fear, which apathy is often the cause of its absence. This point in particular touches the essence of my debate on empathy and the experience of fear. I question: why are we no longer shocked? Why am I myself able to watch an online video of people screaming with horror before being shot to death? Why did Yue Wang die on the street? (see Appendix: The Yue Wang Case) Why are we unaffected by someone's distress in public?

In the 1944 short essay “On Disbelieving Atrocities,” Arthur Koestler powerfully describes the apathetic attitude that his contemporaries maintained in front of the brutalities of World War II (Koestler 2). He highlights the detachment between the occurrences of that time and the realization of human failure, pointing the finger to the aloofness of human relationships. He states:

“But at the same time they lamentably failed to imbue the people with anything approaching a full awareness of what it was all about, of the grandeur and horror of the time into which they were born. They carried on business-as-usual style, with the only difference that the routine of this business included killing and being killed (Koestler).”

This ‘business-as-usual style’ that Koestler denounces is a sort of empathic desensitization to the reality of atrocities, terror and distress, which affect many individuals on a local and global scale. The problematic lack of human connection in light of such horrors is the result of an inadequacy to comprehend the experiential content of fear (or other emotions), which inevitably materializes in the occurrence of these applications.

By the end of his essay, Koestler speaks of an acquaintance of his, who used to isolate himself in a room, and imagine in detail the experience of people killed in Poland: he would imagine what it would feel like to “be suffocated by chloride gas in a death-train”, or “dig his grave with two hundred others and then face a machine gun” (Koestler 4). In Koestler’s opinion, he had the grand ability to engage the audience with storytelling, because he understood the meaning of empathy. Eventually, he exhausted himself with a nervous breakdown, but Koestler believes that he brought his personal plane closer to the reality plane of his time, transcending his own humanity.

This is where I intend to emphasize the significance of empathy over apathy, for it being more than sympathy or acknowledgement of someone else’s condition. When combined with experience design, empathy becomes the key to connect individuals, who are occupying separate spatial and temporal domains. Particularly in the context of fear, empathy can assess individual
THE ROLE OF EMPATHY IN HUMANITY

It seems like mankind is going through what many have called an ‘affective revolution’ (Bloom 2). The findings in the biology of empathy have shown that there is a connection between experiencing the feelings of others and morality. Naturally, the regions of the brain responsible for empathy and suffering are connected to the ones for the storage of moral standards. Therefore, the production of empathy has led to new questions, including how it could be reproduced to generate morality and promote ethics.

Since it gained prominence as a fundamental player in individual and collective relationships, empathy has been praised and criticized, in a similar way as fear. Because it is a vicarious experience, it is ineffectual to describe it as ‘experiencing’ the emotions or feelings of others. Empathy is an extremely sophisticated imagination process. Kant recognized early on that there is a persistent problem with empathy: he called it the ‘other minds.’ This obstacle dictates that individuals must rely on their imagination, and knowledge of the self and others, in order to conceptualize the experience of others. In other words, if empathy performs within speculation, then the reality of the experience of others is a far-fetched truth. Above all, when an individual has no understanding of the self and others by means of experiential memories, empathy is nonexistent.

If we truly should act by means of empathy to improve ourselves and our societies, then we must decide how willing we are to undergo the experiences of others, including the negative ones. I have been questioning how design could effectively give meaning to empathy, especially when there is currently no way to authentically do so, and specifically in the context of fear. Through this research and the final installation for this project, I challenge all of us to ‘literally’ experience the fear of someone else, in order to dispute the limits of our own empathy, to redefine it for the philanthropic connotation of its essence, and to erase the monetary value we have imposed on it.

The role of empathy is to embed tangible and intangible experiences in the form of memories, and transcend ourselves for having understood the connection to other human beings.
MONETARY AND PHILANTHROPIC EMPATHY

I spent many years volunteering for non-profit organizations. Working mostly with Honduras and Uganda, I quickly comprehended the similar challenges that affect these two countries: the top issue be poverty, which consequently magnifies inequality, violence and lack of education. When I visited Honduras for the first time, I was welcomed with open arms, for two reasons: first, I was there to solve challenges that seemed internally inextricable; second, I was an economic source, which in a country affected by poverty results in the justifiable cry for donation. Whereas I thought I was operating with an empathic approach, I quickly realized it was all but a monetary-based empathic approach. Where research has shown that making monetary donations increases the sense of fulfillment of those living in luxury, such superficial empathy wears out just as quickly as the click of the mouse to initiate a bank transaction. What has been lost in this monetary abuse of empathy is the human connection: the understanding of someone else’s distress in the form of experiential content. We need to rethink the meaning and consequences of empathy.

In this controversial topic of implementing fear to stop its misuse, I question the limits of empathy when individuals truly step in the experience of others. In particular, when sharing the bodily sensations that form an experience of fear, the intent is to stage a space for the occurrence of authentic empathy, questioning how we can design empathy.

SENSORY SPACES

Delving further in the sensory experience of fear, I designed a questionnaire to gain a further understanding of the bodily processes involved (see Appendix: Sensing Fear). Inspired by the Finnish research on the universality of emotions, I intended to investigate the integrity of sensory data among individuals of different gender, age and cultural background, living in different countries. By asking the participants of my research to rank their senses from most elevated to least perceived, the results showed how fear plays with sensory perception (please refer to the appendix to see the full results and methodologies for collecting data). The intention was to understand how sensory spaces engage with one another in the presence of such emotion, questioning how design can produce an experience that triggers the body discomforts felt during fear. Such findings will also be significant in the continuation of this project, where a future implementation of this data can be introduced within contemporary technology and wearable applications.
AUDITORY SPACE

The auditory space is the sensory system which includes the peripheral receptors, and the central data encoders. The most external receptors allow the ears to process the auditory data, and send it to the most internal nerves to comprehend the sensory information of a specific sound. The auditory space is connected to the vestibular space, where the vestibulocochlear nerve transmits sounds and equilibrium to the brain.

In a fearul situation, the auditory space finds itself as the most heightened of the senses, followed by sight, temperature, touch, balance, smell and taste.

VISUAL SPACE

The visual space consists of the external and internal organs responsible for processing visual details. It performs some complex functions, from converting light into monocular representations, forming a binocular perception from two dimensional projections through the outermost devices, the eyes, identifying visual objects by assessing distances between them, to finally navigating the body in relation to visual evidence. The visual space is particularly important in matching auditory data with visual identification, but it plays a major role in proprioception and vestibular functions, where it controls balance and stabilizes the corporeal barycenter in relation to mass.

THERMAL SPACE

The thermal space refers to the body system of temperature regulation. This is a process of continuous exchange of information between the internal organ condition and the external environment, where the receptors on the outer shell of the body regulate homeostasis.

When experiencing fear, body temperature is heavily affected by the infinitesimal occurrence of events, where a sensory overload affects the body homeostasis and triggers both vasodilation for sweating and piloerection for insulation. The thermal space can additionally engage the tactile system, in which temperatures in the external environments are measured to trigger a response for protecting the self.
VESTIBULAR SPACE

The vestibular space contributes to corporeal balance, spatial orientation, dynamics and kinematics. This complex system is connected to the auditory and visual spaces, where the vestibulum and the eye respectively control the sense of balance, and perception of movement through space.

In the instance of fear, the vestibular space is affected creating loss of control, feelings of derealization and of depersonalization, and dizziness.

OLFACTORY SPACE

The sense and reception of smell is situated in the olfactory space, where the nose is the most peripheral apparatus in the detection of chemical signals and volatile substances. Connected to the gustatory and limbic systems, the sense of smell affects memory, moods and behaviors. Particularly in fear, it can create a sense of alertness by heightening the perception of chemical related signals and by detecting the somatosensory characteristics of external stimuli.

GUSTATORY SPACE

The sense of space is significant to humans for the detection between toxic and harmless substances. The complex system of papillae on the tongue acts as chemoreceptors for the perception of salt, sour, bitter, sweet and savory ‘flavors,’ differentiating during fear, the gustatory space is the least heightened, perhaps due to a sensory overload of the other spaces. However, multiple recounts have admitted to a sour and dry taste in one’s mouth, as the body adjusts after the experience.

SOMATOSENSORY SPACE

Commonly known as the tactile system, the somatosensory space is the complex collection of thermoreceptors, photoreceptors, mechanoreceptors and chemoreceptors, which produce touch, proprioception and haptic perception. This multiplex structure is able to communicate between the most peripheral areas of the body, and the core of the nervous system, where it is responsible for the feelings of hot and cold, numbness and tingling, shaking and grazing, to name a few in the context of fear.
THE EXPERIENCE OF FEAR

The physiological experience of fear was illustrated very early by Darwin in his compendium of human emotions. He wrote:

With respect to fear, as exhibited by the various races of man, my informants agree that the signs are the same as with Europeans. They are displayed in an exaggerated degree with the Hindoos and natives of Ceylon. (...) Malays when terrified turn pale and shake; (...) native Australian being on one occasion much frightened, showed a complexion as nearly approaching to what we call paleness, (...) a nervous twitching of the hands, feet, and lips; and by the perspiration standing on the skin. Many savages do not repress the signs of fear so much as Europeans; and they often tremble greatly. With the Kafir (...) the shaking of the body is much experienced, and the eyes are widely open, (...) the sphincter muscles are often relaxed, just as may be observed in much frightened dogs, and as I have seen with monkeys when terrified by being caught (Darwin 290).

Darwin’s work has been significant in implying the universality of emotions by means of a physiological experience. In order to continue his illustrations, and along with the Finnish study mentioned in an earlier section, I conducted a series of questionnaire to validate the identical bodily sensations, as described in the 19th century work. The most significant aspect that transpires from all findings is the discomfort caused by the physiological experience of fear.

The body of an individual experiencing fear will first perceive the quickening of the heart beat. While the nervous system prepares for an adequate response to the threat, the circulatory system engages in a full acceleration of the heart. As a consequence, the respiratory system demands a higher level of oxygen, resulting in faster breathing and hyperventilation. The inadequate supply of blood to the brain together with vestibular oscillation result in dizziness, or the impairment in spatial perception and stability. One of the most foreign sensations is derealization: due to the sensory overload during intense fear, memories and sensory information create a sudden detached sensibility from one’s surroundings. This inconsistency alters the perception of external experience, forming a temporary anomaly in the understanding of reality. Such sensation affects the visual, auditory, and vestibular spaces, leading to another extraneous experience, depersonalization. Described as the temporary anomaly of awareness of the self, the body is perceived as an external disconnected entity, far from the individual identity. During depersonalization, the concept of the self is eradicated, leaving the individual to experience the discomfort of forsaking one’s memory.

While the mind is engaged in depersonalization and derealization, the body undergoes paresthesia and muscular tremor. The former is the sensation of tingling and numbness, produced
Sensations emulated by the installation, “The Limits of Empathy,” to produce the physiological experience of fear:

1. Rapid heart beat
2. Accelerated breathe
3. Hyperventilation
4. Dizziness
5. Derealization
6. Depersonalization
7. Paresthesia
8. Muscular tremor
9. Cold Sweat and goose bumps
10. Hot flashes and perspiration
The heart beats quickly and violently, so that it palpitates or knocks against the ribs; but it is very doubtful whether it then works more efficiently than usual, so as to send a greater supply of blood to all parts of the body; for the skin instantly becomes pale, as during incipient faintness. This paleness of the surface, however, is probably in large part, or exclusively, due to the vasomotor centre being affected in such a manner as to cause the contraction of the small arteries of the skin. That the skin is much affected under the sense of great fear, we see in the marvellous and inexplicable manner in which perspiration immediately exudes from it. This exudation is all the more remarkable, as the surface is then cold, and hence the term a cold sweat; whereas, the sudorific glands are properly excited into action when the surface is heated. The hairs also on the skin stand erect; and the superficial muscles shiver. In connection with the disturbed action of the heart, the breathing is hurried. The salivary glands act imperfectly; the mouth becomes dry, and is often opened and shut. I have also noticed that under slight fear there is a strong tendency to yawn. One of the best-marked symptoms is the trembling of all the muscles of the body; and this is often first seen in the lips. From this cause, and from the dryness of the mouth, the voice becomes husky or indistinct, or may altogether fail.

Charles Darwin

If it is demonstrated that fear is universally unpleasant, why is it then still perpetuated in our societies? The installation proposed for the final stage of this research pushes the public to undergo the universally recounted emotion of fear, through the bodily sensations explored in this chapter. Experiencing fear invites all of us to explore the limits of our personal empathy, and to contemplate upon our role in societies where fear is still misused. If, by experiencing fear and understanding its impact, humans can gain insight of their bodily weakness, then this project will have succeeded in demonstrating the madness of practicing violence, intolerance, terror and abuse, which hold the prevailing occurrence of fear.

Fear is the tool to counteract the use of fear in human relationships.
COLLECTIVE SHARING

Due to the intrinsic quality of fear and the imaginary experience of empathy, it is paramount to open a discussion on the possibilities we hold as humans to rethink the role of these components in our societies. The intent of this research has been to amend the view of fear and review its experiential content, by using it to counteract its global contemporary application and collectively discuss our predisposition to empathize. The result of such study concluded with “The Limits of Empathy,” an interactive public installation that directed its visitors through a controlled experience of fear.

After externalizing the physiological content of fear as experienced by the body, the installation replicated it on a platform that used formal manipulation, and auditory and somatosensory data to recreate the unpleasant bodily sensations of being afraid. The visitors of the installation were invited to voluntarily step into the platform, after being provoked by the question, ‘to what extent can you bear someone else’s experience?’ Such choice was intended to both analyze individual behaviors in collective spaces, and to visualize the potential of public zones to rethink the way we share subjective conditions.

In the specific case of “The Limits of Empathy,” the floor was manipulated to create a subtle incline to affect the vestibular space, reproducing the effects of dizziness, depersonalization and derealization. Auditory data in the form of heart beat and breathing were output by hidden speakers and sub woofers, that used low-, mid- and high- frequencies to a affect the auditory, vestibular and somatosensory spaces of the visitors.

The installation furthermore utilized a laptop, two Parallax PIR motion sensors, and an Arduino board to detect visitors’ movements and output audio based on their location. PureData and Pduino were used to control sound, after the Arduino and motion sensors picked up visitors’ movements in the space.

Image 16. Motion sensor to Arduino to PureData diagram
In order to question the visitors’ own predisposition to empathize, while experiencing someone else’s fear, the installation used three different modalities:

1. A ‘Steady’ track continuously played the regular heart beat and breathing sound of a person. All sounds had been previously recorded with voluntary participants, who underwent a stressful event. The recordings were further edited in order to suppress environmental noises, and emulate the internal sound of the body. A similar way to experience this would happen when placing one’s hands over one’s ears, and listening to softened internal sound of the body.

2. When the PIR motion sensors detected movement, the Arduino board informed PureData to randomly play one of the two ‘Panic’ tracks. Each track last three minutes, taking off from the ‘Steady’ track and reaching a climax point of maximum accelerated heart beat and very intense breathing. ‘Panic_v1’ contained the fear of one individual; ‘Panic_v2’ contained the fear of multiple people, in a sort of public anxiety mode.

3. As long as the motion sensors detected movement in the space, the ‘Panic’ track would continue play, eventually passing the climax point and intersecting with the ‘Steady’ track. If the motion sensor did not detect movement, the ‘Panic’ track would interrupt, and the ‘Steady’ track would start playing.
As the installation wanted to investigate the specific question of endurance, both as a temporal and spatial predisposition to empathy, visitors were allowed to move throughout the space, informing themselves of the physiological content of fear, while experiencing it on their own bodies.

The results in the endurance of the experience varied. Most visitors did not want to engage with installation, as they were startled by its effects while standing in the larger exhibition space. Some visitors opted out as the intensity of the heart beat and breathing increased within the first minute of the ‘Panic’ track. They stated that it was overwhelming for them, and they could feel their own heart beat and breathing accelerating as a consequence of their own body synchronization to
the other individual’s fear. The small amount of visitors that underwent the whole duration of the experience found it paralyzing, while exciting. As demonstrated in chapter 2, there is indeed a very close connection between fear and excitement, which allowed for curiosity in the experience of the installation itself.

Personally, as the designer of the experience and as a visitor of the installation, I found it especially overwhelming in the somatosensory space. The low frequencies travelling through my body had an incapacitating effect on my limbs and respiratory system. As my breathing synchronized with that of the imaginary individual in the installation, I felt the need to exit and recuperate my energy to breathe again, while my legs were weakened by the vibration of the floor. However, the repeated exposure to the physiological experience eventually led to a sort of desensitization, demanding an increment of the intensity, which without fault provoked every time a paralyzing discomfort in experiencing fear.

Without question, “The Limits of Empathy” has been able to provoke a reaction in the investigation of how to design fear, and to challenge the predisposition to empathize in a public context.
Image 19. The Limits of Empathy, installation (aerial view); Experience Design, Konstfack Degree Exhibition 2014

Image 20. The Limits of Empathy, installation (form detail); Experience Design, Konstfack Degree Exhibition 2014
The Limits of Empathy, installation (motion sensor, detail); Experience Design, Konstfack Degree Exhibition 2014

The Limits of Empathy, installation (visitor interaction); Experience Design, Konstfack Degree Exhibition 2014
The Limits of Empathy, installation (visitor interaction); Experience Design, Konstfack Degree Exhibition 2014
Image 27. The Limits of Empathy, installation (visitor interaction); Experience Design, Konstfack Degree Exhibition 2014

Image 28. The Limits of Empathy, installation (visitor interaction); Experience Design, Konstfack Degree Exhibition 2014
APPENDIX

CHAPTER 4: EMPATHY

SUPPORTING WORK

This appendix contains a collection of sources, annotations and inspiring works by other authors to support the writings presented in this chapter.

ADDITIONAL RESEARCH

Additionally, I reserve space for supplementary research information completed in the development of the thesis project.
THE YUE WANG CASE

ANALYSIS AND SPECULATION OF FEAR-SPECIFIC CASES: WHERE EXPERIENCE DESIGN CAN HAVE AN IMPACT

The 2011 case of young Yue Wang, getting hit by a minivan in the streets of Foshan and dying 8 days later because 18 people watched as she was overrun by a second vehicle and left bleeding for 8 minutes, is easily explained by psychology as the ‘bystander effect’ (Schwartz).

In the aftermath of the event, Foshan residents came to explain why they just watched without intervening: one mother, walking by with her own child, expressed an overall feeling of fear for herself and her daughter, leading to a quick escape route. Later, however, she felt “regretful, compassionate, painful at heart and guilty” for not helping Yue (Schwartz).

The driver, who caused the death of Yue, later admitted that his reasoning behind the decision of leaving the girl to bleed to death was due to finances: if Yue died, he may only have to pay about 20,000 yuan ($3,154); but if she was injured, it may have cost him hundreds of thousands yuan of medical expenses.

In light of this and other events, Law Professor Jerome Cohen stated that in actuality Chinese policies place no requirements to respond to requests for help, and that often in the history of Chinese legal cases ‘being good’ has resulted in heavy financial and social repercussions for the good samaritan. The question then becomes: can laws encourage Chinese to lend a hand?

Ultimately, some have expressed the lack of community sense as the explanation why no one helped the young Yue. Along with her family, she is one of the internal migrants of China that had arrived in Foshan a couple of years before. Many of the shop keepers who witnessed the event knew, but had never spoken to Yue’s family, adding to the neglect for help.
SENSING FEAR

A SURVEY ON THE PHYSIOLOGICAL EXPERIENCE OF FEAR AND ITS IMPACT ON EMPATHY

In the pursuit of the understanding of fear as a physiological experience, I created a series of questions to clarify the individual and universal content of its feelings and bodily sensations.

The following pages contain the results of surveys and interviews which wanted to collect individual responses of experiences of fear as endured by the general public. This inquiry gathered 48 participants between January 1, 2014 and January 31, 2014 across North America, Europe and Asia.

The results collected in the following pages only show the responses of 33 participants, as the remainder 15 opted out of some questions, making the survey partially incomplete.

WHAT HAS MADE YOU EXPERIENCE FEAR?

1. Airplane shaking during flights
2. The unknown
3. When someone broke into my apartment
4. Physical violence
5. The sudden situation or the chance of losing important part of life makes me go through this experience
6. Humanity
7. Failure
8. Stranger followed me in the night
9. My thesis project being shitty
10. Almost falling down feeling
11. Stranger at night when I’m alone
12. The thought of being unsuccessful
13. Ghosts, darkness, the unknown
14. Due to a stress that I have had, I started feeling fear just about everything
15. Failure, being watched/stalked/followed
16. Fear of attack at night on the street. Fear of losing a friend or family member
17. Embarrassment
18. Cockroaches, bag worms, the dark, and odd sounds at night in a house by myself
19. Darkness
20. Heights, death, clowns, school in the future
21. Heights
22. Having seen my mother die when I was seventeen years
23. Life, flashbacks, some people, ignorance
24. When I was young
25. Insufficient funds
26. The future of a sick child
27. Life
28. Being open with my thoughts and sexuality
29. The eminent permanent loss of someone I love
30. Spiders, failure, people jumping out from behind a door
31. Spiders, wars, natural disasters, people
32. Movies, thoughts, dreams, other people
33. To fly / airplanes
THINKING OF YOUR FEAR (THAT OBJECT, PERSON, ANIMAL, SITUATION, ETC), CAN YOU DESCRIBE HOW YOU FEEL DURING SUCH EXPERIENCE?

1. Almost as if I am removed from the situation; my senses are very alerted and heightened, and I feel out of control
2. Panic, empty, suffocation
3. Fear for my own safety
4. Anxiety, stress, ready for anything, pumped up
5. Its the realization of the fact and feeling of being naive weak and helpless
6. Hopelessness, sadness, despair
7. Helpless, unable to move, struggling
8. Creepy, panic, stressed, paranoia
9. Anxiety, stress, depressed, paralyses, unable to do, hot flashes...
10. Feel pain in my womb
11. Sensory overload. I’m overly aware of everything around me. I think of ways to escape
12. Trapped, panicked, like the world may truly end
13. My heart beats faster, I don’t want to move from where I am, I might cry
14. I just feel horrible, the feeling is so bad, I can’t even describe it. Sometimes the fear is so strong that it seems to you are going crazy
15. Panicked. Like my whole world is falling apart
16. Without control, panicked, nauseous, wired
17. I very rarely feel fear on my own. It’s usually at the prospect of upsetting or letting somebody else down
18. It feels like my heart stops beating momentarily and then there’s a rush of energy that comes immediately next where my heart begins to race! I usually take a sharp breath inward and sometimes, if the fear comes as a surprise, I’ll give a little shout
19. Total sense of panic
20. Anxious, nervous, chills, dread, heartbeat fluctuates, blackout
21. I feel small & young. Not willing to follow through with the action of climbing. I feel like someone is using a spoon to scoop out my insides
22. Helpless and useless
23. Excruciating pain
24. Scared nervous
25. Sad, excluded
26. The great physical pain and helplessness in the face of illness
27. I get goose bumps and start feeling cold.
28. Anxiety, rejection, introversion, independence, love
29. A loss of the ability to grasp the concept of hope or constructive thought blended with helplessness, followed by panic at this realization
30. My heart races and I often feel paralyzed.
31. Scared, cold sweat, fast heartbeat, chills, anxiety
32. I feel trapped, out of control of my own body, and very, very small
33. I am in panic, it is like the world stops and I cannot hear anybody
WHICH OF THE COMMON SENSES DO YOU PERCEIVE AS THE MOST ELEVATED DURING YOUR SPECIFIC FEAR?

During this exercise, participants were asked to recall the sensorial experience during their particular fear, and rank their senses from most elevated to least perceived. The senses included in the question were hear, sight, body temperature, touch, balance, smell and taste, which compose both the traditional and non-traditional operations involved in the translation of sensory information to perception.
WHAT IS THE INTENSITY OF SOME OF THE MOST COMMON SENSATIONS DURING YOUR EXPERIENCE OF FEAR?
The participants were asked once more to recall their particular experience of fear, and rate their bodily sensation from ‘unbearably intense’ (with a value of 5) to ‘I don’t feel that’ (with a value of 1). An intermediate rating value, labeled ‘intense’ (with a value of 3), was given to mediate an interval between the two extremes. The rating system used in this exercise was developed and measured after the Likert’s 5-point scale, evaluating any kind of subjective or objective criteria of the respondent.

The purpose of this question was to understand which bodily sensations occur during an episode of fear, as felt by the participants of the workshop. The list in this and the previous page rates these phenomena from most intense to least intense.

<table>
<thead>
<tr>
<th></th>
<th>I don’t feel that</th>
<th>Uncomfortable</th>
<th>Intense</th>
<th>Very Intense</th>
<th>Unbearably intense</th>
<th>Average Rating [max. 5]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Pounding</td>
<td>0%</td>
<td>6.25%</td>
<td>18.75%</td>
<td>37.50%</td>
<td>37.50%</td>
<td>4.06</td>
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<tr>
<td>Feeling of Loss of Control</td>
<td>6.45%</td>
<td>9.68%</td>
<td>12.90%</td>
<td>35.48%</td>
<td>35.48%</td>
<td>3.84</td>
</tr>
<tr>
<td>Fast Breathing</td>
<td>6.25%</td>
<td>15.63%</td>
<td>28.13%</td>
<td>37.50%</td>
<td>12.50%</td>
<td>3.34</td>
</tr>
<tr>
<td>Derealization (feelings of unreality)</td>
<td>12.90%</td>
<td>22.58%</td>
<td>19.35%</td>
<td>16.13%</td>
<td>29.03%</td>
<td>3.26</td>
</tr>
<tr>
<td>Shortness of Breath</td>
<td>9.38%</td>
<td>28.13%</td>
<td>18.75%</td>
<td>25%</td>
<td>18.75%</td>
<td>3.16</td>
</tr>
<tr>
<td>Voice Trembling</td>
<td>6.25%</td>
<td>37.50%</td>
<td>25%</td>
<td>15.63%</td>
<td>15.63%</td>
<td>2.97</td>
</tr>
<tr>
<td>Sweating</td>
<td>16.13%</td>
<td>16.13%</td>
<td>35.48%</td>
<td>19.35%</td>
<td>12.90%</td>
<td>2.97</td>
</tr>
<tr>
<td>Hot Flashes</td>
<td>15.63%</td>
<td>21.88%</td>
<td>34.38%</td>
<td>15.63%</td>
<td>12.50%</td>
<td>2.88</td>
</tr>
<tr>
<td>Leg Weakness</td>
<td>12.50%</td>
<td>34.38%</td>
<td>18.75%</td>
<td>25%</td>
<td>9.38%</td>
<td>2.84</td>
</tr>
<tr>
<td>Depersonalization (being detached from oneself)</td>
<td>21.88%</td>
<td>31.25%</td>
<td>12.50%</td>
<td>12.50%</td>
<td>21.88%</td>
<td>2.81</td>
</tr>
<tr>
<td>Muscle Shaking</td>
<td>9.68%</td>
<td>38.71%</td>
<td>25.81%</td>
<td>16.13%</td>
<td>9.68%</td>
<td>2.77</td>
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<tr>
<td>Dizziness</td>
<td>19.35%</td>
<td>38.71%</td>
<td>16.13%</td>
<td>12.90%</td>
<td>12.90%</td>
<td>2.61</td>
</tr>
<tr>
<td>Tingling</td>
<td>9.68%</td>
<td>48.39%</td>
<td>29.03%</td>
<td>6.45%</td>
<td>6.45%</td>
<td>2.52</td>
</tr>
<tr>
<td>Chills</td>
<td>29.03%</td>
<td>29.03%</td>
<td>16.13%</td>
<td>12.90%</td>
<td>12.90%</td>
<td>2.52</td>
</tr>
<tr>
<td>Abdominal Distress</td>
<td>32.26%</td>
<td>25.81%</td>
<td>16.13%</td>
<td>19.35%</td>
<td>6.45%</td>
<td>2.42</td>
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<tr>
<td>Numbness</td>
<td>28.13%</td>
<td>37.50%</td>
<td>15.63%</td>
<td>12.50%</td>
<td>6.25%</td>
<td>2.31</td>
</tr>
<tr>
<td>Feeling of Choking</td>
<td>53.13%</td>
<td>21.88%</td>
<td>9.38%</td>
<td>9.38%</td>
<td>6.25%</td>
<td>1.94</td>
</tr>
<tr>
<td>Chest Pain</td>
<td>51.61%</td>
<td>29.03%</td>
<td>6.45%</td>
<td>9.68%</td>
<td>3.23%</td>
<td>1.84</td>
</tr>
</tbody>
</table>
WHAT IS YOUR RESPONSE TO YOUR SPECIFIC FEAR?

After having recalled their bodily sensations, participants were asked to give some details of their response to fear by providing a description of what they believed happened during and right after their experience.

1. I sit and wait: there is really no escape route while flying!
2. Stay, make it pass, move on
3. I freeze, as in being unable to do anything
4. Stand my ground
5. I tend to take some time, tend to stop, or sit, it feels like all the energies of body are gone or lost. In fact feel lost
6. I try to talk to people around me. I try to think positive
7. Control my breath, talk about it
8. Pretend normal until too scary then ruuuuun!
9. I become irrational and panicky in my work habits, thinking I am not working hard enough, when really I should step back and go for a run
10. Can’t open mouth
11. I’m a flight. I try to run away
12. It’s a bit of both fight and flight. The panic I get pushes me to do something to want to change but my imagination cripples my confidence as well
13. Flight? If hiding is considered flight
14. I just try to realize that it is unrealistic to be afraid of something you don’t know. Just try to use common sense and understand that this feeling will go away, maybe it will take hours, but it will go away. But derealization and depersonalization are own of the worst feelings, I guess. But the only thing I can do is just to wait until my condition will change
15. Flight
16. I want to believe that I would fight. Thankfully I’ve never actually had to do one or the other, it’s always turned out to be not what I thought. I have only even really felt frozen and then relief once I realize what was really going on
17. Depends. Usually flight
18. If my fear is a bug or something small that I can escape, I’ll move VERY quickly away from the “thing.”
19. I stand with my senses focused on what to do next, in a “fight” kind of response
20. I try to relax and stay together. I might leave, it depends if I’m able to leave, and if I feel it is appropriate for me to leave
21. Saying “Oh no”. Gasping. Grasping the nearest things to my body. Closing eyes
22. Try to stay calm
23. I clench my fists and teeth, squeeze my eyes, listening to music that can drain the excess adrenaline
24. I try to convince myself it’s wrong to feel fear
25. Impotence
26. Shout, fight, not think about it, find help, run!!!
27. I view my fear as an external response to what I cannot predict. I view fear as a mountain I must climb, and climb quickly, as I cannot perish. I love the challenge of fear; it clarifies my mind and makes decisions I cannot while clear-minded. I overcome
28. In a way I both ‘fight’ and ‘flight’ at the same time. I hold my ground and my body goes into emotional lockdown (perceptually to the witness) Most of the time I go numb inside to ‘protect myself’ until the second I am alone and it is safe to be emotional
29. I usually try to get myself back to a calm state - steady my breathing, tell myself it’s not that bad, etc
30. Screaming/words can’t come out. Flight and fight, depends on the fear
31. Curling up in a ball, trying not to move, or running away. Definitely always an escape/flight response instead of a fight one
32. Scream at people.
DO YOU WISH THAT OTHERS WOULD EMPATHIZE WITH YOU, WHEN YOU ARE AFRAID?

Perhaps the most controversial question, participants were asked if they would like others to empathize with them when they are afraid. Participants explored the meaning of empathy and the circumstances of sharing a particular bodily experience.

**Extra Comments:**

1. Because it makes me feel even weaker
2. Maybe not, because it’s not a gee feeling. I don’t want my be loved friends and family feel that, but probably dentists and doctors
3. Since my case is really intense, I don’t think that other people will be able to understand how I truly feel. So I don’t think that their sympathy or support will somehow help me. Only the people who have the same fears and disorder might be able to really feel that horrible condition I am in
4. I don’t have phobias so I don’t feel fear very often
5. Having others who aren’t scared at the same time allows me to be less scared. I trust them and get over it sooner
6. It happened to me once and I made cry two other people, so I decided that my darkest fears remain where they are, inside me, hiding them in the best
7. However, I never want any one to witness when I am afraid or in pain. I always feel like they may use it against me. I also feel that it may make me appear weak to them
8. Because you are more detached from a situation when you’re not the one experiencing it, it may be helpful to hear about someone else’s fears and how they have dealt with it or not dealt with it to gain a new perspective
9. I don’t like to talk about my fears, or having people taking care of me and empathize with me

**Results:**

- **Yes:** 64.52%
- **No:** 35.48%
WOULD YOU EMPATHIZE WITH OTHER, IF YOU WERE TO EXPERIENCE THEIR EXPERIENCE OF FEAR?

1. Yes my friend! But can we talk to each other while we are sharing the experience?

2. I feel a lot of empathy for people with phobias. I hate feeling afraid and I don’t think it’s funny to scare people.

3. It would depend if your fear were legitimate. If you’re afraid of heights, then yes. If you’re afraid of harmless insects, then definitely not. In fact, I’ll likely get pissed off at you for being afraid of something so ridiculous.

4. I can only empathize with that which I have experienced.

5. I know fear, and I know it can be conquered, and that is what I can empathize with.

6. I would not use your fear against you but I would not trust you to do the same.

7. I think sharing fear can either squash it or multiply it.

**Extra comments:**

1. Interesting, also how body and mind react just after the fear is gone.

2. I really don’t know if it is possible to cure this kind of disorder, when a person is just afraid of everything...But if your research will somehow help this field of studies, I am happy I participated in this survey. In the end, just wanted to note, that anxiety and disorder are the worst things I have experienced, and I really doubt that it can be somehow cured by people who have never experienced it themselves. For doctors we are just people who “are afraid” and that is all. And it really sucks. Good luck with your research!

3. It might be interesting to find out how often people feel fear. I don’t think I am afraid of very much but when I am afraid I feel it so intensely. I have friends though that will scream and then laugh on a daily basis.

4. The fear of losing something is big. But bigger than this is the fear of losing the memories of what you have already lost. Good job.

5. Fears must be faced and overcome. Feel fear is human, but fear does not solve problems.
Final Reflections
Future Work
Conclusive Summary

Bibliography
FINAL REFLECTIONS

As long as we continue to speak of empathy, we will not have achieved its scope. In order to adopt an empathic attitude, it is imperative to embed the experiences which form a full understanding of our ‘being human’ condition. Such experiences come in the form of ingrained memories, which allow individuals to understand the environment surrounding them and those occupying it. This is where the significance of experiences makes its stand: as humans progress and produce new knowledge, they will expand their experiential content, achieving higher standards of evolution and social interaction.

Whereas fear has proved to be amendable, after the comparison of its faults to its possibilities, empathy still lacks its core objective. It is not enough to imagine someone else’s experience, or to be sensitive of another’s condition. Empathy must be experienced in its pleasant and unpleasant forms. The experience of fear has ultimately served well in the context of a public installation, but it must be scaled up and experienced by those who still implement it, in order to interrupt its contemporary application.

Bringing back Koestler’s statement, “For as long as there are people on the road and victims in the thicket, divided by dream barriers, this will remain a phoney civilisation,” it is my belief we are far from truly empathizing. However, due to the global nature of our daily lives, we are slowly becoming aware of universal conditions, and we are gradually enhancing our connections to individuals we have never met. It is my hope that with this expanded interactions, we will be able to grow our experiential content, eventually leading to true embedded empathy.

In conclusion, the contemporary connotation of fear as an instrument of intimidation can be outplayed for its potential application in transhumanism, curiosity and imagination. It can furthermore be implemented on a ‘fear-for-fear’ methodology, where it is utilized to counteract its practice. However, this study has confirmed that there is a substantial lack of personal predisposition to endure someone else’s experience of fear, leading to the deduction that empathy is still a vicarious phenomena. Only a conscious reflection of personal predisposition, and a comprehensive embodiment of experiences can point towards an actual implementation of empathy.
Humans are conglomerates of physical and psychological processes, which govern the way we behave individually, relate to others and act in the environment we occupy. From a biological standpoint, it all makes perfect sense: there are infinite amounts of outer stimuli, with which humans engage temporally and spatially in matters of infinitesimal amounts. Their information is processed in such a complex manner that it is difficult to emulate their spontaneity. Nevertheless, they make us function and react consequentially in the occurrence of cause-effect events that surround our existence. The sequential and dimensional quality that these bodily systems possess is at the core of our humanity. Yet as humans, we are confused by these inner processes, and mystified by our intrinsic emotions. We wonder why we reacted a certain way, or why we felt a specific sensitivity, just to discard the ephemerality of the experience by blaming it on the turmoil of our emotive composition.

Humans count six basic emotions: anger, disgust, fear, happiness, sadness and surprise. While this research has extensively investigated one of them, there are five more which could be explored using a similar methodology, additionally analyzing them in their interaction.

As mention in chapter 3, Evolution, there are also great possibilities for design to expand when meeting biomimicry, biophilia and transhumanism, highlighting new opportunities for the future of humanity. This is a space where design can collaborate interdisciplinarily with other fields of study, combining different expertise in the pursuit of new knowledge.

I believe, however, that the most thriving place for new investigation lays in the analysis of experiences and empathy in collective spaces. The installation “The Limits of Empathy” opened a small platform for the discussion of how experiences are shared in public settings, but the context in which it operated did not visualize the large scale capabilities that such question holds. Therefore, this investigation only proposes a further exploration of how public spaces could facilitate the sharing of intrinsic experiences, influencing individual behaviors and social interactions.
CONCLUSIVE SUMMARY

The objective of this research was to identify the potential of fear in the production of empathy, while showing an alternative perspective of emotions in our societies. The implementation of an experience design methodology dictated an exploration of the physiological context of emotional experiences, resulting in the application of a sensorial engagement in order to generate an intangible experience of fear. The research concluded that, while fear holds an incredible evolutionary potential for our human species, empathy is a secondary phenomena that needs reevaluation. With such statement, this research deliberately intended to highlight the limits of our social empathic behaviors, leading to a debate on our individual predisposition to bear someone else’s experience of fear. By proposing such experience in the form of a physiological public installation, this research determined that emotional experiences create knowledge in the form of experiential content, which become embedded in the individual undergoing it. Additionally, it revealed the need to reframe the definition of empathy, from a vicarious phenomena to a participatory social behavior, which must become an integral part of our societies.

Furthermore, whereas an experience of fear demonstrated the unpleasant application during its sensorial engagement, the physiological public installation proposed a new environment for the manifestation of emotions, and the creation of empathy in spatial design.
BIBLIOGRAPHY


AT&T Operators Recall War of the Worlds Broadcast. *AT&T Archives and History Center*. Warren, New Jersey: Film.


Hatemi, Peter K. et al. *Fear Dispositions and Their Relationship to Political Preferences.* Department of Political Science: University of Iowa, IA, 2010. Print.


“Protest.” *COLORS : 134.* Print.


Wellerstein, Alex. “NUKEMAP by Alex Wellerstein.” Nukemap 2.2 Web. 4 Mar. 2014.


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