Me & My smartphone.

A study into our relationships with our phones.

Master Thesis
Design for Interaction
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Background Image by Pawel Kuczynski

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Executive Summary

Smartphones have become an inseparable gadget and beneficial tool in our lives. Imagining a future without them would truly be impossible. When a new technology arrives, society needs time to adjust and become aware of the impact products have on people and our ways of behaving.. This always takes time. In the case of smartphones, the last few years have shown a growing amount of literature, media, researchers and most successful people in the world give attention to the negative effects and developments smartphones and social media has had on many people around the world.

This thesis did even so, but has as final goal to create awareness, stir debate and provoke reflection within the audience about the subject. To do so we used design as tool. This particular movement is called Critical Design.
Through an extensive literature research the present effects and developments in different areas of expertise were identified, such as the cognitive area, psychological, physiological, and social. From a user study empirical data related to the matter was collected, the way people feel, think and experience their own relationships to their phones.
Combined, these scientific findings led to five interesting themes that we transformed into a smartphone manifesto, which could then be used as basis for the idea generation.

The Social Paradox
The Loss of Solitude
Your Internal Friction
The Addiction
Your Divided Attention

For each theme, one design has been made. The final outcome of this thesis is a collection of five critical designs, from which three have been developed into prototypes. As part of these designs, narratives have been created in the form of commercial like videos, setting the context and adding to the completeness of the design concepts.

By combining personal perceptions towards society with scientific evidence and empirical data, a translation from a very scientific background towards a more artistic way of designing was made. There was no prior process similar to the one taken in this thesis, which allowed a very open, new and free way of going through the design process.

In a qualitative final evaluation, 8 people were interviewed in order to find out if the critical designs provoked them and created critical reflections towards our own behaviors and relations to smartphones within society.

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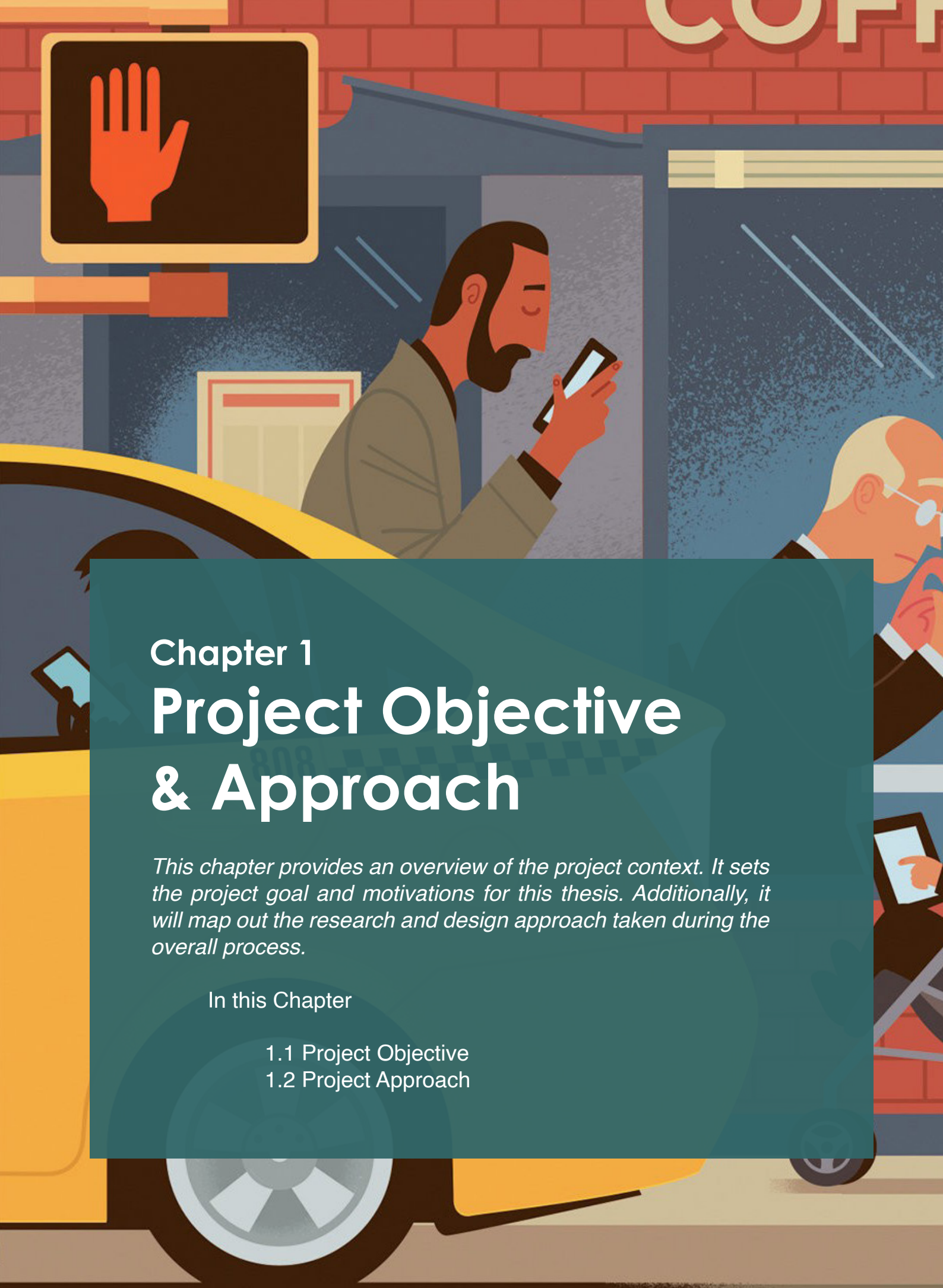


Chapter 1

Project Objective & Approach

This chapter provides an overview of the project context. It sets the project goal and motivations for this thesis. Additionally, it will map out the research and design approach taken during the overall process.

In this Chapter

1.1 Project Objective
1.2 Project Approach

Background Image by Paul Rogers for the New York Times


EE SHOP

Figure 1.1 Photograph of the first Iphone. (Apple)

2007: The year the first smartphone was born

On January the 9th, 2007, Steve Jobs introduced the “revolutionary product” he promised. The first ever three-in-one device. A widescreen Ipod with touch controls, a revolutionary mobile phone and a breakthrough Internet communications device.

1.1 Project objective

All species have a communication system, but humans have shown to be more successful at conveying information, making them the only species having shown real growth. Going from ancient cave paintings more than 30.000 years old, to the creation of the Internet and smartphones facilitating split-second communication. This chapter provides an overview of the objective and approach of this graduation project.

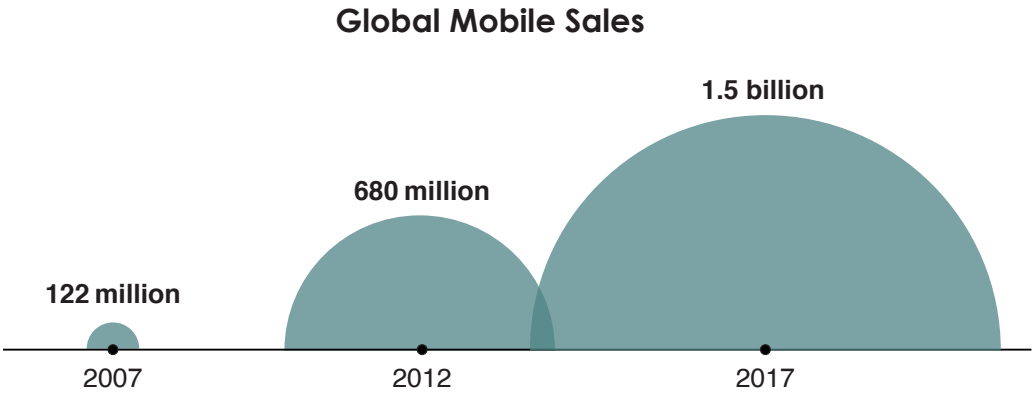


Figure 1.2 Growth of global mobile sales since 2007, since the release of the Iphone. (Groupe Spéciale Mobile Association)

1.1.1 Introduction

It is only 12 years ago since Apple launched its first smartphone and today, the Netherlands is the number one country in smartphone possession with 95% of the population according to a study done by Deloitte in 2018.

The latest generation of smartphones have powerful computing capabilities, large amounts of memory and screens with operating systems that even encourage application development. The infinite amount of applications have brought tremendous benefits to users. From instant communication with family and friends, to health, fitness, management apps and professional education tools, the list of advantages is endless. The limitless access to information, knowledge and entertainment make them very convenient and irreplaceable gadgets.

But their omnipresence has also brought its own disadvantages. In 2018 the World Health Organization says that the "Use of the Internet, computers, smartphones and other electronic devices has dramatically increased over recent decades, and this increase is associated not only with clear and tremendous benefits to the users, but also with documented cases of excessive use which often has negative health consequences. In an increasing number of countries, the problem has reached the magnitude of a significant public health concern." It is only a matter of time before smartphone disorder and social-media disorder will be included by the WHO in the International Classification of Diseases.

As Intel Co-founder Gordon E. Moore said in 1965, with such rapid growth comes rapid social change in the ways we behave and communicate (Moore, 1965).

Anything having such a driving force and that we use this often, is worthy of critical observation and thought, because anything we do this often has lasting effects on us.

This project will focus itself on these rapid changes smartphones have brought in our societies, looking at the broad spectrum of all the effects that are developing themselves.

Figure 1.3 Photograph of Tristan Harris

"Every application, every website, every online service is competing ultimately for attention. They are all competing for the one finite resource that we all have, which is, attention, or our time.
What's the best way to get attention? It's to be better and better at persuading people, at tapping into more and more of these psychological instincts, so that people come back and stay, so you can hook them." (VPRO, 2016).

-Tristan Harris, former design ethicist at Google.

1.1.2 Project Aim

The central aim of this project is to create awareness and provoke critical thinking about our relationships towards smartphones. Researchers, intellectuals and the media all around the world have been given attention to this topic.
Within the scope of this project design will be used as a tool to make people think, and to thus raise awareness, spur debate, and provoke positive action (Malpass, 2017).
This will be done by combining a user centered and critical design approach. First the most important problems and developments will be identified to combine these findings with the insights gathered from a user study. A series of critical designs will be the final outcome of this thesis.
The motivation to put forth this thesis comes first of all from a personal worry related to the matter, and the alarming health problems and societal changes we have been witnessing the last years.
If design can be a successful tool to raise awareness and make an audience more conscious about their behavior and the effects these bring along, we can say a small contribution has been made towards a healthier future.

1.1.3 Problem Definition

As the smartphone has proven to be unique in its capacity to link absent worlds and create unlimited connectivity and endless networking possibilities,
a more complicated picture emerges. On the one hand, the benefits are irreplaceable and the possibilities infinite. A world without would be unimaginable. Information and Communication Technology has proven to be one of the most important factors in globalization, changing people's connections, the relative meaning of time and space and eliminating physical boundaries.

The emergence of smartphones and their computational capabilities in particular, have provided us with access to a virtually infinite array of potential diversions, while being so portable that they are always with us. (Dwyer, Kushlev, & Dunn, 2018). But with a positive side, comes a negative one.

Figure 1.4 Motorola Vice President John F. Mitchell showing off the first portable radio telephone in New York City in 1973.

The strongest evidence may be our daily smartphone use, being on a average of 2 hours a day for people between 18 and 59 years old (Deloitte, 2018). Younger generations between 14 and 24 years old are even reaching an average of 3 to 4 hours daily. As mentioned, the World Health Organization said the problem has now reached the magnitude of a significant public health concern. Numerous studies are mentioning health related issues to an overuse of smartphone devices, going from prolonged stress, symptoms of depression, sleep disturbances (Thomée, Eklöf, Gustafsson, Nilsson & Hagberg, 2007) to the negative effects the presence of a smartphone can have on conversation quality and connectedness (Dwyer, Kushlev, & Dunn, 2018).

This project will aim to encourage and empower people to become more conscious and aware of their smartphone use and the plausible health related consequences these might bring to them and to everyone around.

"We had no idea that in as little as 35 years, more than half the people on Earth would have cellular telephones."

- Martin Cooper, Inventor of the cellular mobile phone.

1.2 Project Approach

This project is divided into four main stages. The first two focus on research, and have as goal to investigate the issues and developments occurring within the human - smartphone relationship. This is to set a framework for the design process. The final two stages focus on developing and delivering the designs.

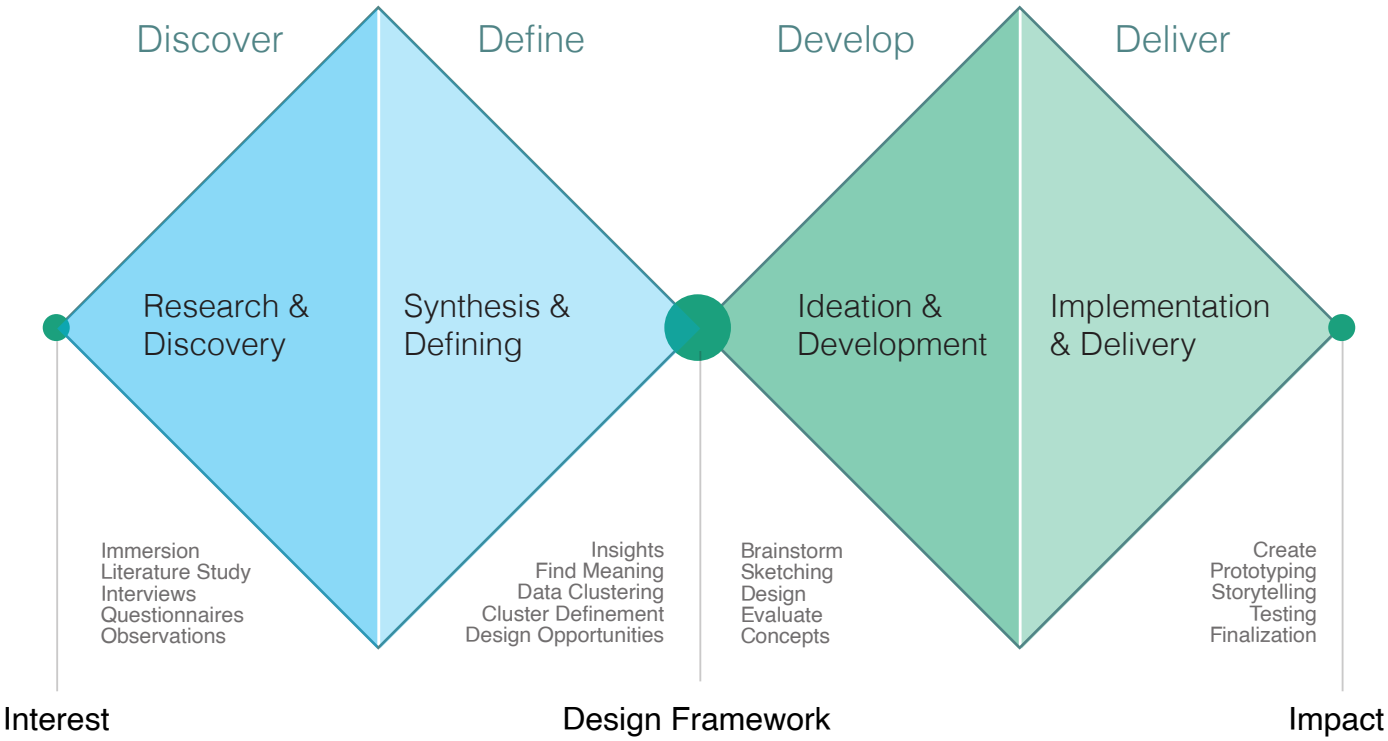


Figure 1.5 Project Approach

Design Goal

Engage and provoke debate/reflection within the audience by creating a series of critical designs based on scientific insights, encouraging them to think critically about the repercussions of their personal and our collective relationships to smartphones.

1.2.1 User Centered & Critical Design

Within this project, the double diamond design approach will be followed. It is divided into four phases with two divergent and convergent phases. In these different stages, different design methods, and activities have been chosen based on the design goal. In this case, the bridging of a user - centered and critical design approach gives this project its own flavor.

Discover

In this research phase, the goal was to map out and understand the present issues and developments related to smartphone use. A very broad spectrum of different areas were investigated; physiological to psychological issues but also neurological and of course societal ones were looked at. An extensive literature study was done, followed by observations, interviews and questionnaires to understand how users think, feel and experience the current interactions. This resulted in interesting findings.

Define

In this phase, the goal was to synthesize the findings and create a sharpened design framework. Through the analysis of the first phase, inconsistencies, problems and clusters were made leading to 5 interesting themes covering the overall issues and developments related to smartphones. A set of surprising scientific insights were chosen to underpin each theme, creating the design framework for the critical design series.

Develop

The challenge of this phase was to ideate and create a set of critical design ideas, based on the scientific facts. Creative group and individual brainstorm sessions were held. The chosen concepts are iterated upon small user tests, to end with final design concepts for each theme, that meet the design goal.

Deliver

In this phase, the final concepts are finalized in the form of prototypes, extrinsic narratives and storytelling are created to situate the products into context, allowing the audience to understand and engage with the design and the underlying critical message.

Chapter 2

Critical Design as A Tool

This chapter provides an introduction and overview of critical design theory and practice. It sets the overall domain in which this project will operate. Additionally, it will show examples to give the reader an idea of how critical design works in practice.

In this Chapter

2.1 Function & Impact
2.2 Examples

Background Image / Haus-Rucker-Co, "Environment Transformers", 1968.

2.1 Function & Impact

As Dunne & Raby argue, the design profession needs to mature, and develop alternate roles than just serving and reinforcing capitalistic values. Design may also be used as a method of cultural provocation. In this project, critical design is used as method to critique design, science and social concerns.

2.1.1 Function

As Malpass mentions in his book Critical Design in Context: "Critical design takes place in the world of product design, but without focusing on commercialization or the physical utility of a product. It's main function is to share critical perspectives and creating debate within the audience. This has as goal to raise awareness about often societal, cultural and ethical issues related to science, technology and the ways they impact our lives. "

The main objective of critical design is to get people to think. It aims to raise awareness and challenge assumptions. Ultimately it hopes to get people to act. Critical design is part of a growing number of different design approaches, such as reflective design, slow design, and counter-functional design; which each have as aim to slow the interaction with objects down, to allow meaningful and questioning engagement with the products we use in daily life.
These approaches function if the designs are interpreted and understood through active critical participation of the audience; and each of the designs has a more social or political orientation, instead of a commercial one, to empower publics, challenge expectations and question technology.

History

The term critical design was first created by Anthony Dunne (1997), and described a form of design that he and Fiona Raby came across as they researched different areas in the early 1990's. As they said "Critical design counters conventions of utility, technology, and fiscal gain. Produced for exhibit rather than sale, these designs are less about problem solving and more about problem finding within disciplinary and societal discourse."

The beauty of critical design may as well be that it is a type of practice that offers different approaches to product design that go beyond the solving of problems.

What's so critical about critical design practice?

Product design has been defined to in a way be "a specifically critical act challenging how mainstream design unthinkingly propagates the values, assumptions, and ideologies inherent in the designer who passively embodies these values in products."
So in other words, a critical design practitioner is a designer that thinks critically and will not assume and adopt blindly that the values and ideologies society adopts are the right ones; so he takes a critical approach and tries to embody his perspective in his design interventions. In that sense, it is a method of cultural provocation, and has as role to be the starting point of how these social issues and political themes might enter design practice.

Personal Perspective

The motivation for this graduation thesis comes from personal, critical views and opinions related to the rapid changes in our society regarding smartphone technology. I hope to convince, provoke and raise awareness to the reader and audience by giving a clear picture of my own critical thoughts and the ones other academics, writers, researchers and inspiring people have been trying to do before me.

(a)	(b)
affirmative	critical
problem solving	problem finding
design as process	design as medium
provides answers	asks questions
in the service of industry	in the service of society
for how the world is	for how the world could be
science fiction	social fiction
futures	parallel worlds
fictional functions	functional fictions
change the world to suit us	change us to suit the world
narratives of production	narratives of consumption
anti-art	applied art
research for design	research through design
applications	implications
design for production	design for debate
fun	satire
concept design	conceptual design
consumer	citizen
user	person
training	education
makes us buy	makes us think
innovation	provocation
ergonomics	rhetoric

Figure 2.1 A_B Manifesto written by Anthony Dunne & Fiona Raby (2009)

2.2 Examples

Examples are excellent to illustrate theory and ideas. In this section, a series of critical design examples will be shown that especially appeal to me personally. In each case, a different critical stance is taken towards either, societal, ethical or environmental issues.

Figure 2.1 Traces of an Imaginary Affair Kit

Bjorn Franke - Imaginary Affair

This kit allows you to create an imaginary affair, it contains nine different tools, each made to leave marks on the body such as bite or bondage marks, lipstick, scratches and bruises and so on. In addition, perfume probes, hair and lipstick marks can be applied to either body or clothes.

This project approaches the issue of purposefully created jealousy in relationships, which often only serve to boost self-esteem or to test the strength of the relationship. The project was inspired by people who used fake evidence of victimization or illnesses to get attention from others.

Figure 2.2 Water Glass Series - Dispensary, Exhaust & Fountain

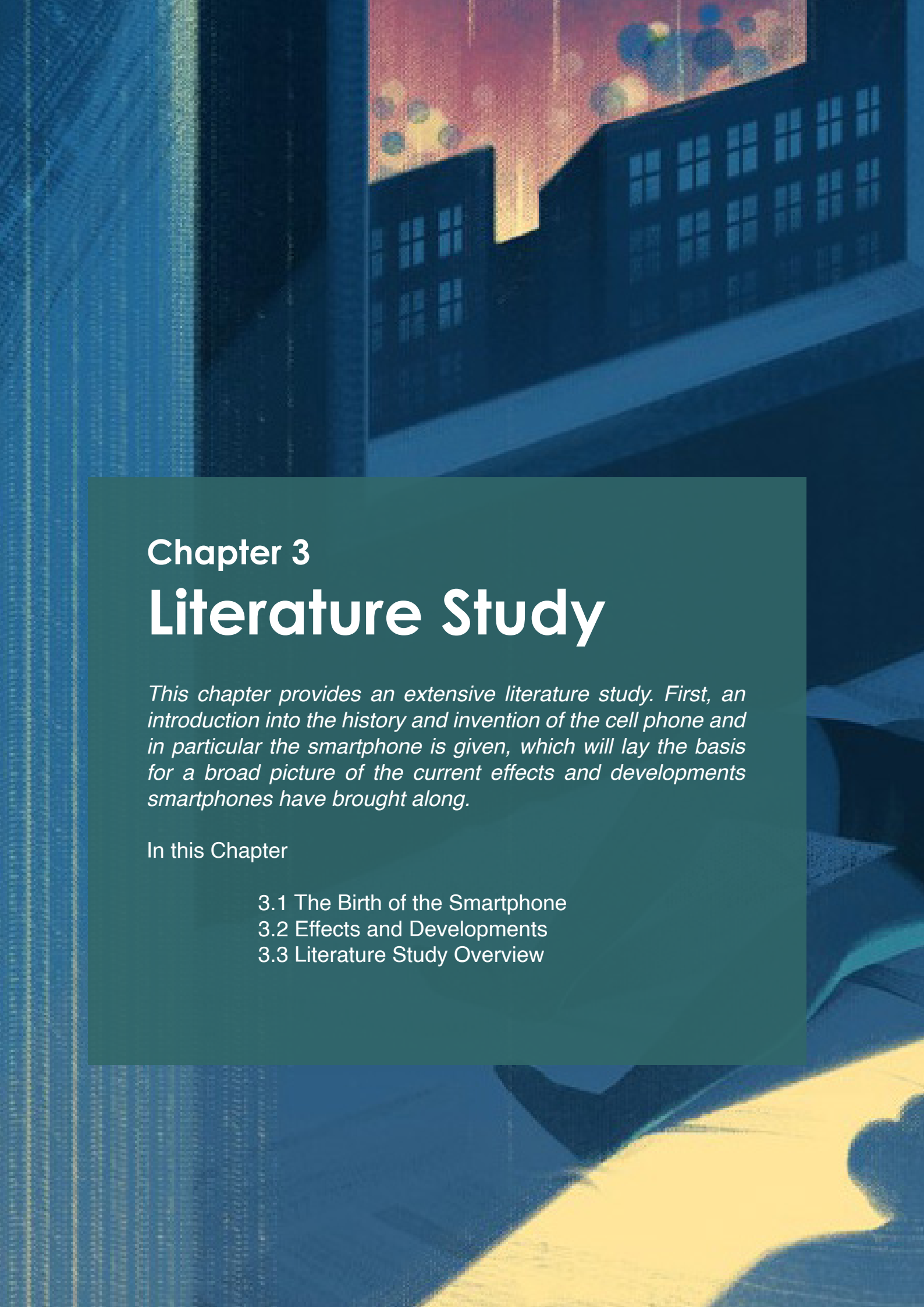
Elizabeth Diller & Ricardo Scofidio - Water Glass Series

The Vice/ Virtue glass series was produced for the 1997 exhibition Glassmanifest, in Leerdam, in the Netherlands. The artists use subtle humor and drinking glasses to show our often contradictory cultural attitudes toward addiction and health. The hacked glasses “accommodate the dual pursuit of health and hedonism” explain the architects.

Figure 2.3 Poor Little Fish

Yan Lu - Poor Little Fish

Poor little fish is a very direct critical design. The water fountain holds a goldfish dependent on the amount of water remaining in the bowl. Yan Lu critiques the ways we consume drinking water, and the immense impact it has on other species in the world.



Chapter 3

Literature Study

This chapter provides an extensive literature study. First, an introduction into the history and invention of the cell phone and in particular the smartphone is given, which will lay the basis for a broad picture of the current effects and developments smartphones have brought along.

In this Chapter

3.1 The Birth of the Smartphone
3.2 Effects and Developments
3.3 Literature Study Overview

Background Image by Jasu Hu

3.1 The Birth of the Smartphone

Before 2007, the popular device that facilitated sending messages and making calls was the cellular phone. This device was most used for those two functions, allowing wireless communication from anywhere at any given time. Compared to the endless possibilities the more recent smartphones provide and the growth and worldwide production of portable technologies in the last decades, drastic changes have taken place in the ways we communicate and make use of these omnipresent devices. .

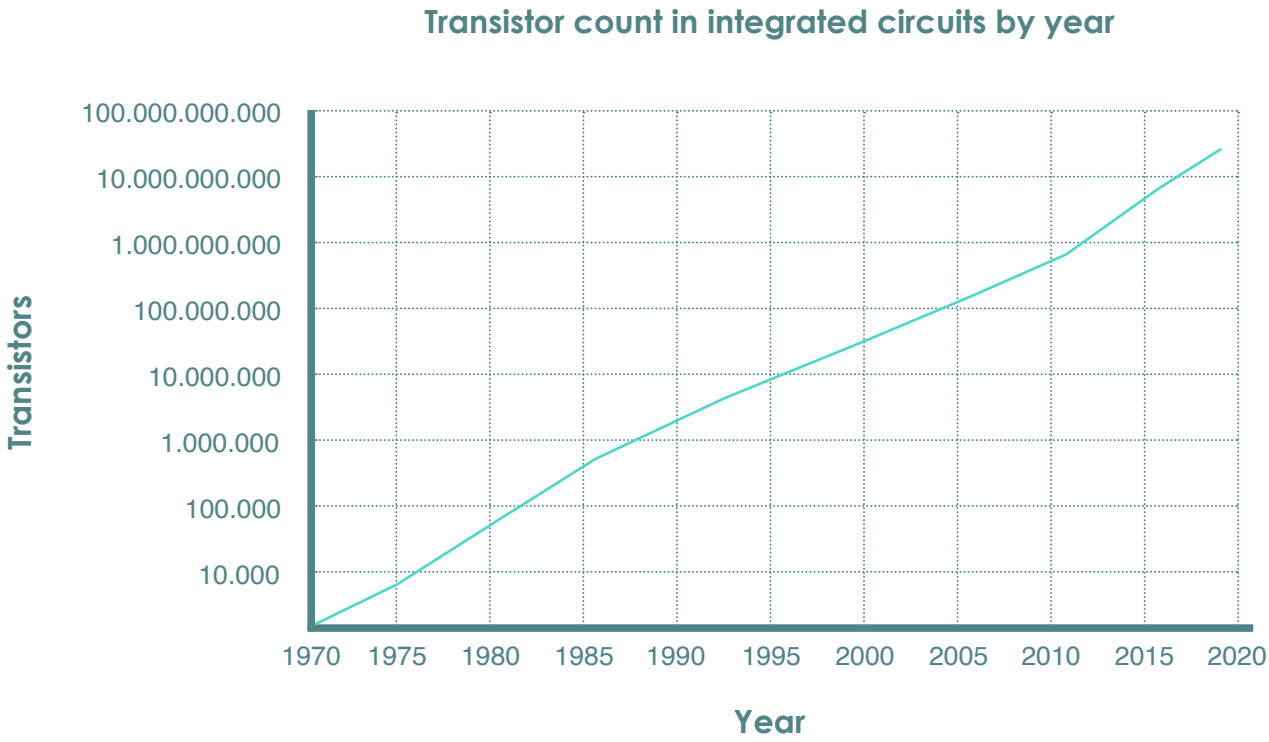


Figure 3.1 Graphic representation of Moore's Law (Moore, 1965)

3.1.1 After the Industrial Revolution

In 1965, Intel co-founder Gordon E. Moore predicted that technological developments would not grow linearly but exponentially, his observations described a doubling every year in the number of transistors in integrated circuits (figure 3.1). We can now say that his observations have become more than true. The Digital Revolution has created and made possible the mass production and worldwide use of computers, digital cellphones and the Internet and marked the beginning of the Information Age. The new Era symbolized the rapid shift from the old Industrial Revolution to an economy based on information technology.

A world economic growth has been witnessed with the contribution of digital electronics, creating a driving force of technological and social change and an immense growth in our economies and overall productivity (Moore, 1965).

3.1.2 The arrival of the Smartphone

A smartphone is a specific type of multi-purpose mobile computing device. They facilitate an extended array of functionalities, ranging from software, Internet and multimedia functions, to the essential features such as voice calls and text messaging.

Before the touchscreen era, smartphones were typically equipped with a physical keypad, mainly targeted for the corporate world, allowing the access to e-mail. A good example was the Blackberry, who became quite popular within enterprise customers. It was in the 2000s that 3G networks emerged, increasing speeds and reach of mobile data (Islam & Want, 2014).

But in 2007 Apple launched the Iphone, setting the standard for a new era, due to opening of the Apple App Store, an online software distribution platform within the device. This was quickly adopted by Google, releasing the Android operating system.

Because of this rapid growth of microchips, open software and wide variety of phone hardware, many of us are now constantly accompanied by the small, convenient computers, keeping us connected to the Internet and each other wherever we are. The trend is only expected to intensify with the rapid growth of emerging wearable technologies (Anderson & Rainie, 2014).

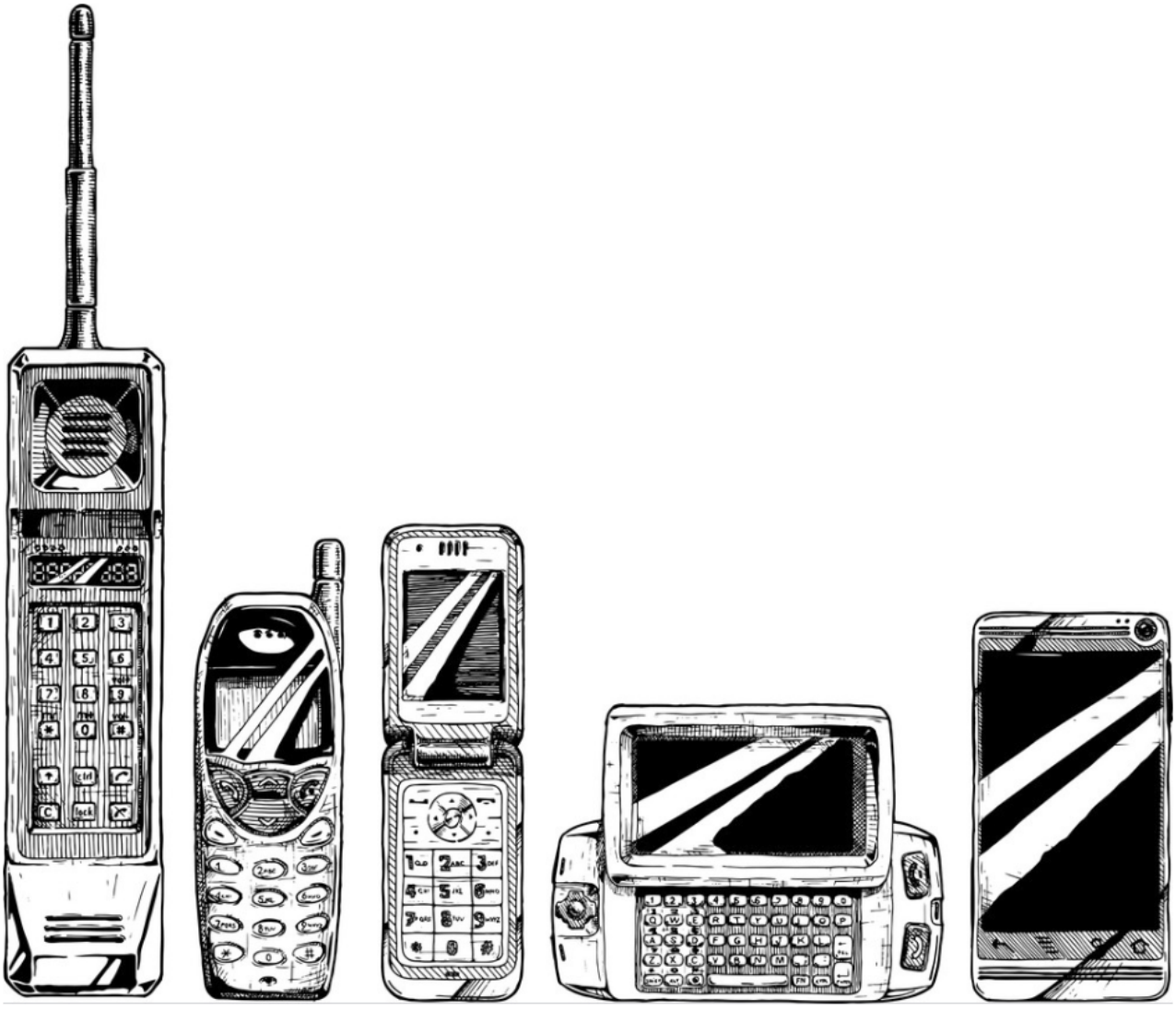


Figure 3.2 Evolution of the mobile phone (by Suricoma).

3.1.3 The Benefits of Smartphones

The benefits smartphones have brought us are limitless. A world without them would be unimaginable at this point in time as more than 3.3 billion people (42,8%) in the world are smartphone owners (Statista, 2019). The devices play a significant role in a lot people's lives, we could say they became an indispensable assistant and a multi-functional tool allowing so many different options.

All in One Device

Apple was the first company ever to have integrated a wide-screen music player, a touch screen, a mobile phone and a web browser in one device. By opening a whole new dimension through the opening of their App store, the possibilities became literally infinite. In 2019, the developers possibilities are endless thanks to these applications platform and the sharing of digital data

Modernized Communication

The devices we own nowadays are capable of video chatting with multiple people at the same time, instantly. Communicating with such speed and information has never been this fast, we are at the pinnacle of instant communication.

Information

Smartphones have access to the internet which means we have never been this resourceful before. Everyone owning a device can in a split second find the information he or she seeks.

Entertainment

Smartphones have unlimited entertainment possibilities, from playing games to streaming movies to social media platforms.

Productivity

Smartphones have allowed us to save time through quick communication but also enabled to work remotely, increasing productivity significantly. Some applications have also help with task management and other similar productivity related things.

E-Commerce

The devices have opened a whole new market that operates through smartphones, creating thousands of new business opportunities.

Image by medium.com

3.1.4 Rapid Global Growth

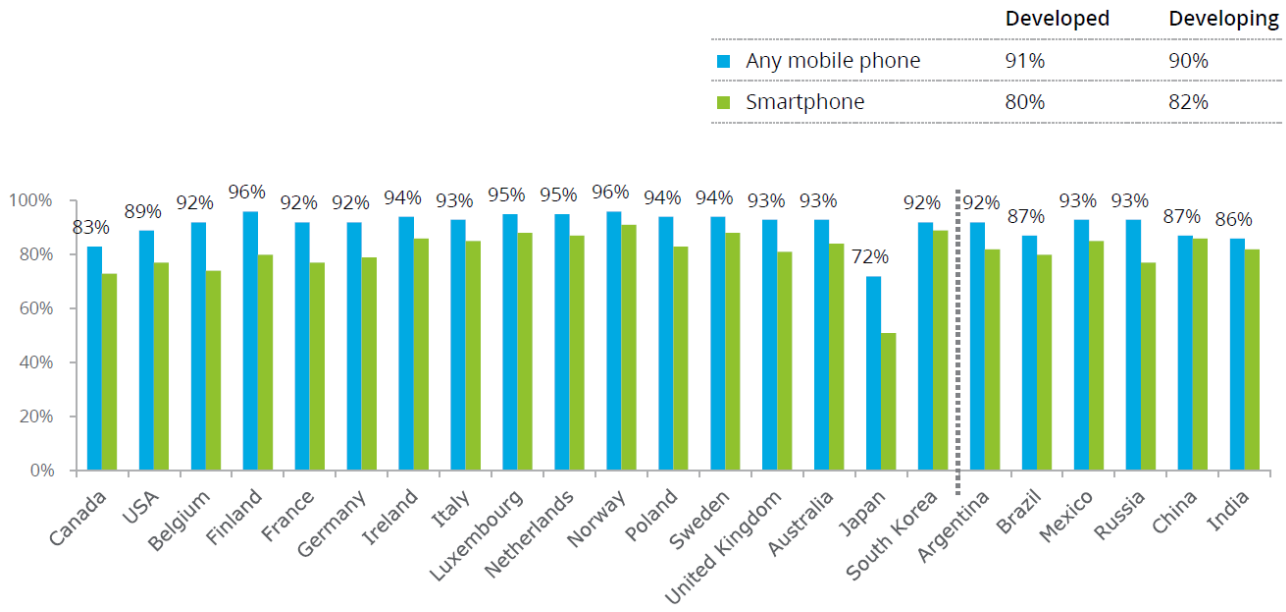


Figure 3.3 Smartphone & Mobile phone ownership in 23 different countries around the globe (Deloitte, 2018).

Statistics

The latest studies (figure 3.3) show the global and fast growth of mobile phone ownership across the world. Almost every developed country now has an average of 90% mobile penetration. The Netherlands is amongst the highest with an average of 95%. (Deloitte, 2018).

Anywhere you go, may it be to a restaurant, walk the streets, sit in the bus, 9 out of 10 people will own a mobile phone. The device has become a human extension.

The modern smartphone exists for just about a decade, but the fact that it has reached such high penetration on a global scale, is truly astonishing.

Figure 3.4 shows the frequency of use in percentage throughout the day and in different situations. Most shockingly, for one fourth of the population, checking their phone is the first thing they do in the morning. 68% use their smartphone while talking to family and friends.

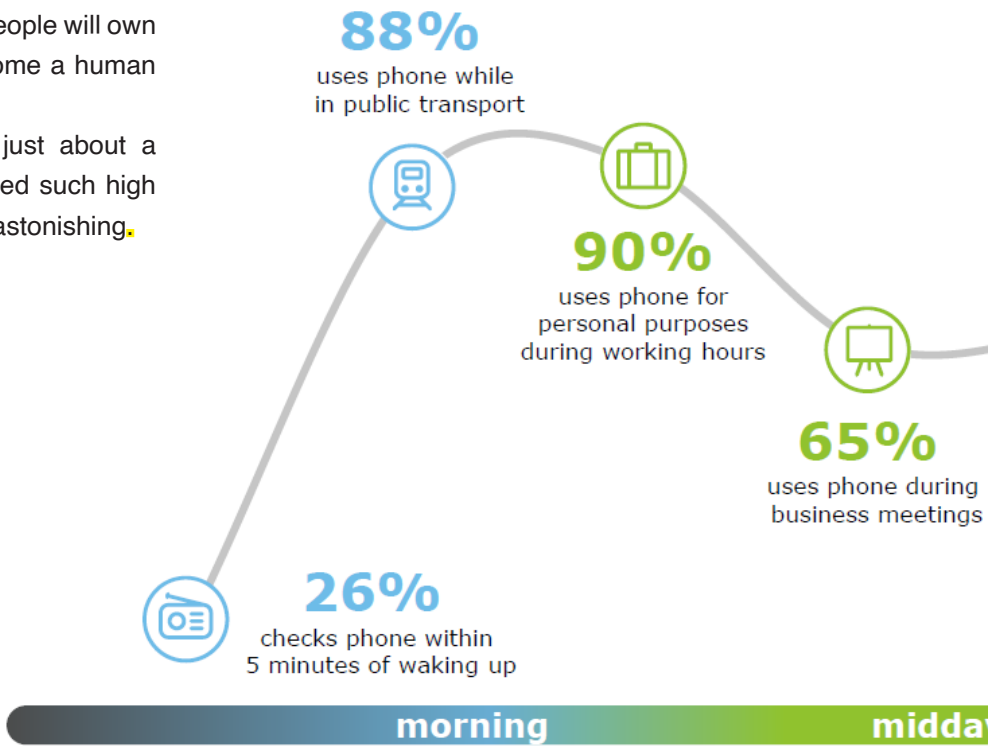
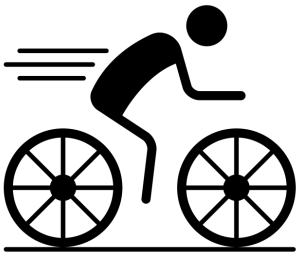


Figure 3.4 Mobile phone usage during the day by the dutch population (Deloitte, 2018).

Unsafe behavior

Through their study, Deloitte show us how smartphone penetration is leading to risky and dangerous behavior. Traffic accidents caused by cyclists has now lead to a bill prepared by the Dutch Minister of Infrastructure that prohibits the use while cycling (Rijksoverheid, 2019). A received fine costs 95 euros.



75%

Of Dutch 18 to 24 year olds use their phone while cycling.

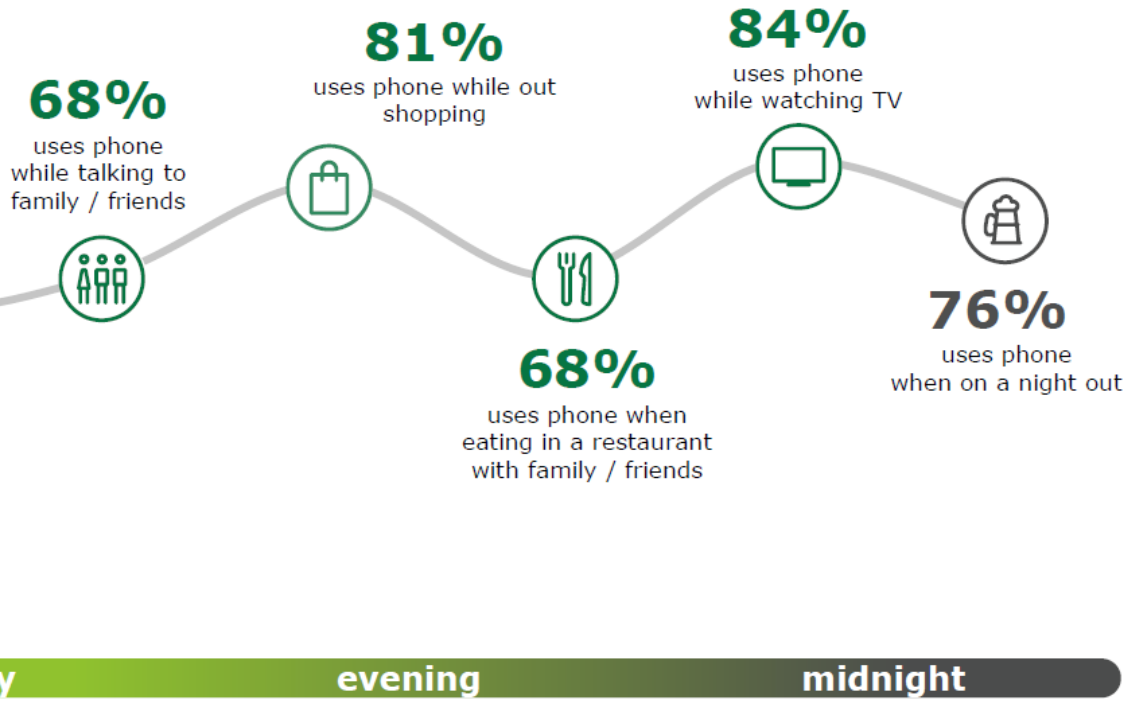
32%

Of Dutch citizens uses their phone while driving.

62%

Of Dutch citizens use their phone while walking/ crossing roads.

The results of the Deloitte study are striking as well as insightful. As much as smartphones are part of our daily lives, for many people, problematic smartphone use has harmful effects, from obvious ones leading to distractions in traffic, to the maybe less obvious ones, causing psychological and mental health issues (Elhai, Levine, Dvorak & Hall, 2016).



3.2 Effects & Developments

As smartphone allow constant connection to information, entertainment and each other, the virtual world is put at our fingertips. They have shown to bring immense benefits, improving welfare, productivity and task management but their persistent presence may come at a cost (Ward et al., 2017). Their addictive and distractive nature, if not controlled and used with moderation, may be the source for the development of negative cognitive, psychological, social and other effects. In this section an extensive literature study has been done.

3.2.1 Cognitive Effects

A study done by Ward et. al (2017) questions if the mere presence of smartphones and their distractive nature may occupy limited-capacity cognitive resources, thereby leaving fewer resources available for other tasks, at the cost of cognitive performance (figure 3.5). The devices seem to promise and create time, productivity and overall enhancement of our performances however have been shown to create unwanted deficits in the off-screen world (Turkle, 2011). Humans have limited cognitive abilities, as they are largely determined by the available attentional resources associated with working memory and fluid intelligence (Jaeggi et al., 2008; Halford et al., 2007). The more smartphones occupy and drain from these limited attentional resources, the less resources are available for complex cognitive behaviors related to decision making strategies, long-term goal pursuit and self-regulation, all related to fundamental processes such as problem solving, creativity, logical reasoning, learning and abstract thought (Ward et al., 2017).

But the never-ending interruptions of alerts and notifications, have also proven to cause inattention and hyperactivity, being directly connected to symptoms of ADHD (Kushlev et al., 2016).

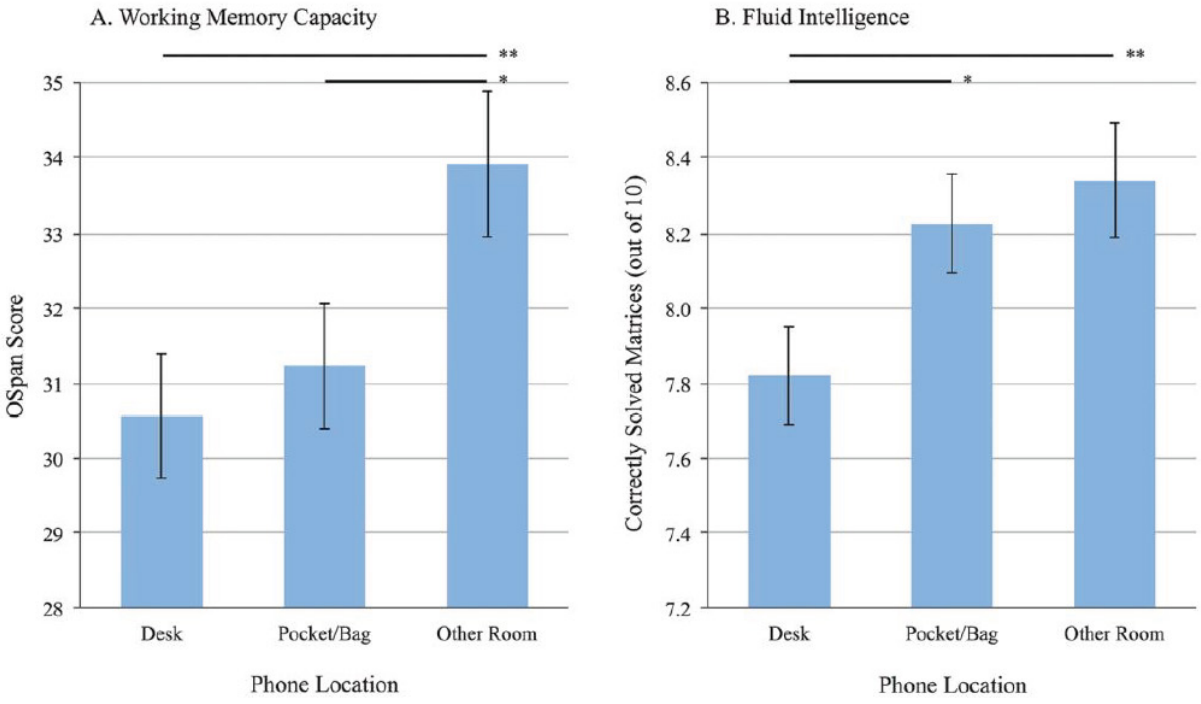


Figure 3.5 Effect of the presence of smartphones on working memory capacity and fluid intelligence (Ward et al., 2016).

We all understand the joys of our always-wired world—the connections, the validations, the laughs . . . the info. . . . But we are only beginning to get our minds around the costs. **- Andrew Sullivan (2016)**

Figure 3.6 Satirical Art by Pawel Kuczynski - Surgery

Learning Performance

Wood, Zivcakova, Gentile, Archer, De Pasquale, & Nosko (2012) examined if multi-tasking with digital technology had any impact on learning in real – time classroom lectures in a university setting. In line with the previously discussed paragraph and the cognitive bottleneck theory of attention (Welford, 1967) the comparison in their study showed a significant difference in performance between the non-technology users and the ones who were assigned to use technology. Especially being engaged in off-task activities seemed to have a detrimental impact on learning. Attractive, engaging and interactive platforms such as social-media applications provided students with a multitude of stimuli to explore and act upon, causing distractions from the content, effecting negatively their test-results.

A bigger cross-sectional study done by Hawi & Samaha (2016) highlighted a correlation between high risk smartphone addiction and grade point average, similarly emphasizing on the destructive distractions during performing tasks and learning in educational settings.

Our cognitive ability is somewhat our individual skill to perform the mental activities related to learning and problem solving. We may argue it is one of the few most important and critical skills a human can possess. But we are training our brains to be distracted by letting technology and smartphones use and drain from our limited cognitive resources, leaving lesser and lesser resources left for us to learn and focus.

3.2.2 Psychological Effects

Smartphones have been linked to a high amount of alarming psychological effects. The technology itself is neutral, but the applications created for it all tend to be designed for one outcome, maximizing the time spent on them. In other words, every application is competing for your time. Especially social media and entertainment platforms are of addictive nature and engineered to be this way (Harris, 2016). What are the effects and motivators for addictive, compulsive smartphone behavior? And what impact do they have on our health?

Addiction

Reinforcement motives

Reinforcement motives can be positive or negative and are often important precedents of problematic behaviors. Positive reinforcement is linked to a positive reward, whereas negative reinforcement is linked to alleviating negative emotions (Skinner, 1938). In the context of smartphones, both behaviors may be present. Achieving instant gratification through quickly accessible rewards (e.g., social networking, communication) has been shown to create higher amounts of checking repetition (Lee et al., 2015), whereas Zhang et al. (2014) show that mood regulation is a significant negative reinforcement motive to alleviate or escape from negative feelings and a contributor to compulsive smartphone use. Both motives lead to addiction (Salehan, 2013).

Positive reinforcements

Social networks build on positive reinforcement mechanisms, which means a reinforcing stimulus is introduced when a wanted behavior occurs, strengthening the behavior and increasing the probability of it to happen again. When the specific behavior is of unhealthy nature, or can cause negative effects, we could say there is a form of addiction or psychological dependency. We could argue that some habits are not always productive, we call those “bad habits”. Bad habits are automatic, counterproductive repetitive behaviors that can become harmful over time (Turel & Serenko, 2012). They more often represent “acts that yield short-term rewards that are inconsistent with long-term intentions and goals” (Ouellette & Wood, 1998). Social media networks and comparable platforms can lead to high engagement, facilitating the development of such a bad habit and the formation of a maladaptive psychological dependency (Turel & Serenko, 2012).

Negative reinforcements

Smartphones are excellent devices facilitating the escape from negative feelings or to alleviate them. The unpleasant reality of a negative feeling can now be put aside by using the smartphone as the reinforcer. This will strengthen such behavior and have impact on an individual’s emotion regulation capabilities.

Emotion regulation in the broadest sense refers to all situations charged with emotions, such as moods, positive and negative affect, stress. (Koole, 2009). Its function is to naturally modify the emotional reaction to adequate levels (Gross, 2002). Based on the purpose, the individual will sustain, intensify or inhibit the emotion by regulating it. This refers to active attempts of people to manage their emotional situations. The effects can be observed on all the emotional reactions such as physiology, behaviors, thoughts and feelings. It may also influence various other aspects of emotional reactions such as their

It’s about giving you more options on screen than giving you more options in life, and that’s not the way we should be designing. **- Aza Raskin (2018)**

Figure 3.7 Caught in the App - Photography by Ritzo ten Cate

intensity, harmony and awareness. (Koole, 2009). Emotion regulation is the basic component of good mental health (Howe, 2005). A study by Lee, Cho, Kim and Noh (2015) found that people with high levels of smartphone addiction had lower levels of self-regulation and more difficulties regulating emotions.

Caplan's (2010) research showed that there was a negative relationship between functional emotion regulation and internet addiction. According to Yildiz (2017), there is a significant relationship between smartphone addiction and emotion regulation.

We can see the dangers if we consider adolescents and younger generations, as their smartphone use is higher in a period of their life where emotional ups and downs are much more present. We have seen that smartphones are powerful devices that build on reinforcement motives. They can result in psychological dependencies and create emotional regulation difficulties, thus standing in the way of the healthy development of an individual.

Anxiety & Depression

A lack of emotion regulation mechanisms and coping techniques may cause an unbalanced mental health status and higher susceptibility to smartphone addiction. In some experiments, participants experience mounting anxieties (Cheever, Rosen, Carrier, & Chavez, 2014) and physiological increases in heart rate and blood pressure when separated from their smartphones (Clayton, Leshner, & Almond, 2015). But as well phantom vibrations in their pockets, despite the absence of incoming notifications. (Kruger & Djerf, 2016).

These withdrawal-like symptoms indicate problematic smartphone use and in combination with emotional dysregulation, may lead to depression. A study done by Elhai et al. (2016) shows that problematic use interferes with more important, pleasurable activities, disrupting social events and thereby reducing active behavior, increasing depression.

Caplan (2003) suggests that individuals under psychosocial distress (e.g. lonely and depressed) may develop a preference for online social interaction which, in turn, leads to negative outcomes associated with their Internet use. Directly related with smartphone overuse are sleep disturbances and the increase in mood disorders shown in a study by Thomée et al. (2007), also contributing to the negative cycle and the increase in symptoms of depression.

We see an alarming rise of psychological mental health issues that come along with the use of smartphones, even leading to anxiety and depressions. Younger generations growing may be the unfortunate victims of these developments, and we can only speculate about the repercussions they may have later in their lives. In next sections I will elaborate on physiological and social aspects related to smartphone use.

3.2.3 Physiological

A preliminary study done by Lin & Peper (2009) studied the physiological patterns arising during cell phone text messaging. Interestingly, the results show that all participants had significant increases in heart rate and that accordingly, the respiration rate increased significantly when sending messages.

When receiving messages, in some cases the breath was held, or rapid shallow breathing occurred. Most of the participants were unaware of these physiological changes although the results were consistent with the empirical data reporting feelings of increased stress.

Obviously, frequent triggering of such physiological patterns (increased heart rate, shallow breathing, tensed muscles) can be at the basis of more serious symptoms of distress and discomfort (Lin & Peper, 2009).

3.2.4 Social Effects

Pro-Social Behavior

Smartphones have made possible instant communication throughout the whole globe, making us connected to each other 24/7. But how does that affect engagement in our real social interactions?

We may argue that mobile devices make people less engaged with their immediate social environment, and this points to the possibility that they may interfere with the formation of new relationships or the simple enjoyment of a conversation that build social capital (Kushlev et al., 2019).

In their study, Kushlev et al. create an experiment in which they test if phones actually interfere with approach behaviors that are critical in building social relationships. They focus on the fundamental approach-oriented behavior; smiling. According to theorists, “smiling evolved specifically as a social behavior that communicates a lack of threat to others” (Shariff & Tracy, 2011), making it central to approach strangers, or novel social partners.

The results of their study show that the presence of smartphones reduce smiling when the opportunity to engage in social interactions is there. The presence of a smartphone reduced the likeliness of smiling to strangers, but to smile genuinely as well up to 30% less than people without a smartphone. (Kushlev et al., 2019).

Smiling is a fundamental building block of human social interactions, and this study shows how the ways we communicate are changing, and reducing something we may all appreciate, a smile.

Interrupted interactions

A study done by Dwyer, Kushlev and Dunn (2018) questions if these devices can distract us from enjoying real life interactions. Using field experiments and experience sampling, Dwyer et al., (2018) show us that when smartphones were used during social interactions, people felt less social connectedness, felt more bored and perceived time to move slower. Their results build on other works showing that phone use is associated with less social impressions and lower interaction quality (Vanden Abeele et al., 2016; Brown et al., 2016; Misra et al., 2014).

Van den Abeele, Antheunis & Schouten (2016) studied the impact of mobile messaging during an offline conversation on relational outcomes, specifically focusing on impression formation, conversation quality and social attraction. The studies revealed a significantly less polite and attentive first impression and a perceived lower conversation quality with proactive phone users.

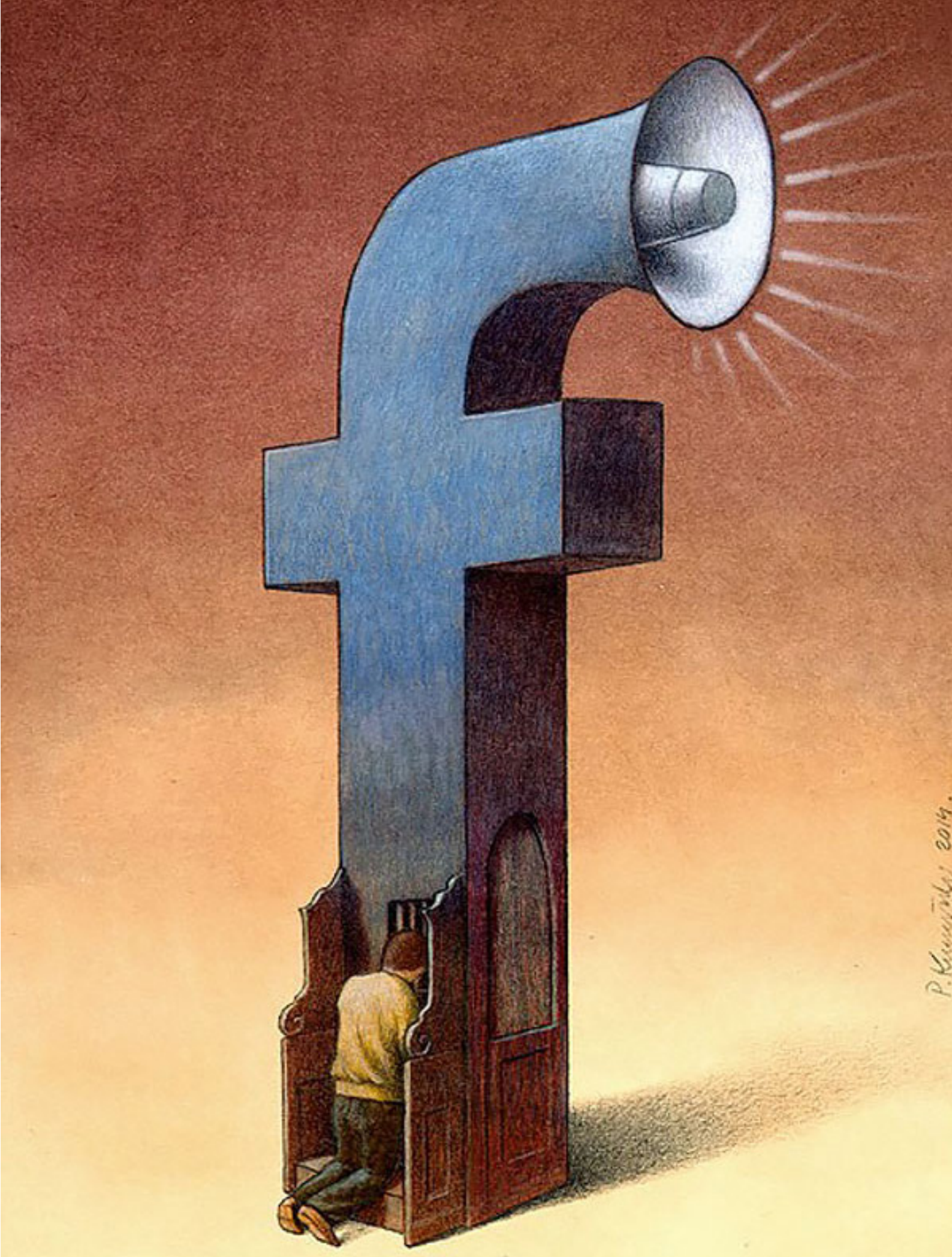


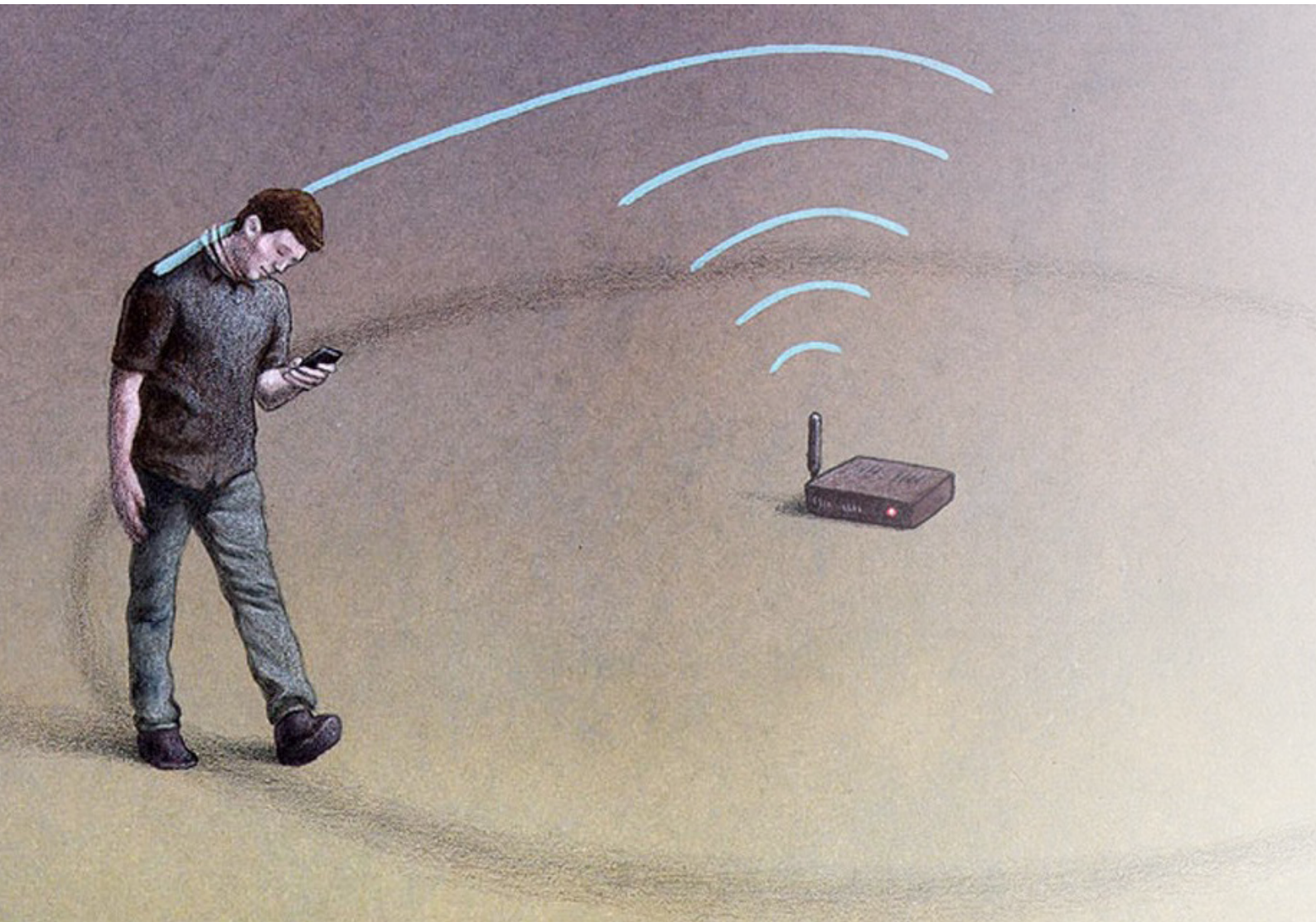
Figure 3.8 Satirical Art by Pawel Kuczynski - Confession

Brown, Manago and Trimble (2016) observed close friendship dyads in a waiting room and analyzed the rated quality of conversation. During the 5 minutes, 76% chose to use their phone at some point during the interaction, and the more time the person spent, the lower the quality of the conversation was rated.
These effects may be minimal, however more frequent interruptions can build up and result in more serious consequences. Thus, phones undermines the enjoyment derived from face-to-face social interactions (Dwyer et al., 2018).
We know strong relationships and frequent social interactions are at the basis of a healthy mental state, and a basic ingredient of a happy life, but in modern society smartphones are starting to interrupt and diminish fundamental pro-social behaviors that facilitate and allow these processes.

Deriving Pleasure

In theory, distractions should also reduce the ability to enjoy and derive pleasure in positive experiences (Brown & Ryan, 2003; Quoidbach, Berry, Hansenne & Mikolajczak, 2010). Brown & Ryan discuss that a direct route through which mindfulness can enhance well-being is its “association with higher quality or optimal moment to moment experiences.”
Telling us that being distracted while having a particular experience, can be a distraction itself from the positive aspects of the particular experience. More generally, research tells us that intrinsic motivation and flow activities, described by engagement and paying attention to what is occurring, produces enjoyment and a sense of vitality (Csikszentmihalyi, 1990).

Figure 3.9 Satirical Art by Pawel Kuczynski - WiFi



Evolutionary Mismatch

Sbarra, Briskin and Slatcher (2019), argue that we may even be witnessing a social evolutionary mismatch. A mismatch between smartphones and the social behaviors, forming and maintaining our close social relationships. An evolutionary mismatch occurs when the modern contexts trigger ancestral needs but in a manner that does not provide the adaptive benefits.

A classic example is the desire for sweet-tasting foods, a human trigger that signaled nutritional value. But in modern environments and with the presence of industrialized foods, most of the foods we can buy are sugar-enhanced, contributing directly to the global obesity pandemic. The mismatch here is quite obvious.

In the same manner, ancestral psychological adaptations that enhanced human survival were for a good part social. Two key elements that evolved are self-disclosure, the sharing of information about oneself to another, and responsiveness, the process of reacting when someone else shares information. These processes evolved to build social bonds, promote trust and enhance cooperation, allowing humans to reproduce and survive. But Sbarra, Briskin and Slatcher argue that smartphones, and especially social networks cue these same processes of self-disclosure and responsiveness but without the beneficial intimacy developments creating the real fertile ground that build long lasting, qualitative relationships, and are at the basis of a healthy social life.

So, it may seem that in some cases, social networks trick our brains as we engage in self-disclosure and responsiveness at any given time we share a picture, like a photo or leave a comment. But as these same adaptations that build our social bonds are being taken over by the virtual devices, we leave behind and get drawn away from the real-time social interactions in the real world. This, is of course not free of consequences (Sbarra et al., 2019).

The challenge for a human now is to be more interesting to another than his or her smartphone..

- Alain de Botton

3.2.5 Effects on Self-Worth & Solitude

In an exploration of the benefits of solitude, Long & Averill (2003) discuss existing literature pointing towards the many advantages that solitude can offer. The first and most apparent according to Suedfeld (1982), was that it averted from the risks of overstimulation. More apparent advantages it may provide are the many opportunities to engage in intrinsically motivated activities and thoughts. Long & Averill discuss the freedom of constraints it gives but also the freedom to engage in any desired activities. It has also often been linked to creativity, and this has almost become a cliché, the writer in his cabin, the painter in his studio or the scientist in his laboratory. But Csikszentmihalyi (1997) found that adolescents who could not be alone, would often fail to develop creative talents such as playing a musical instrument, drawing or writing. It is obvious that to develop such talents, spending time in solitude is necessary.

A perhaps much more beneficial advantage is self-transformation through solitude. Otto Rank, Maslow (1971) but even so Storr (1989) linked solitude to self-transformation. As we separate us from our social and physical environments, we temporarily remove ourselves from the people and objects that define us. Storr (1989) suggests that by retrieving ourselves from the places and people that reinforce our identity, we give room for self-examination, reflection and "reconceptualization of the self", but also, coming to terms with change. Studies done by Koch (1994) and other empirical evidence tells us that we cope and digest our external and internal concerns when we spend time in solitude, giving us new understanding of ourselves and our priorities (Long & Averill, 2003).

In modern times, spending time in solitude becomes very rare, and with an over-stimulation of information and distractions, one might argue if there is still room for moments of solitude on a daily basis.

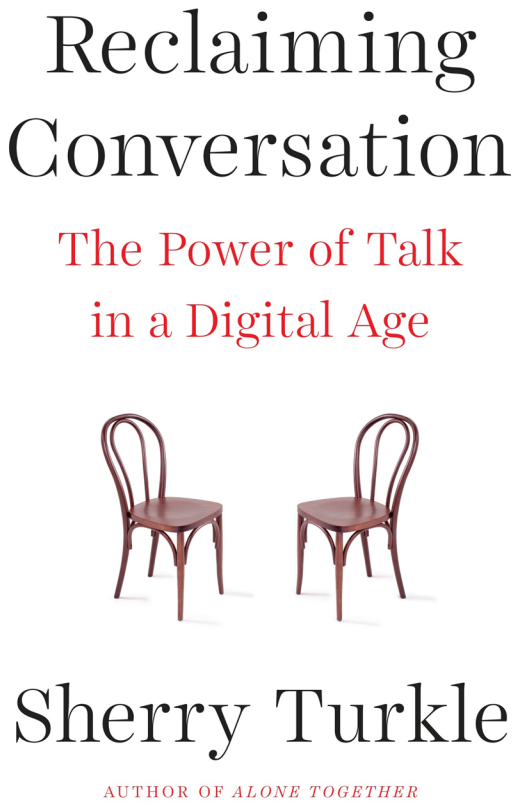
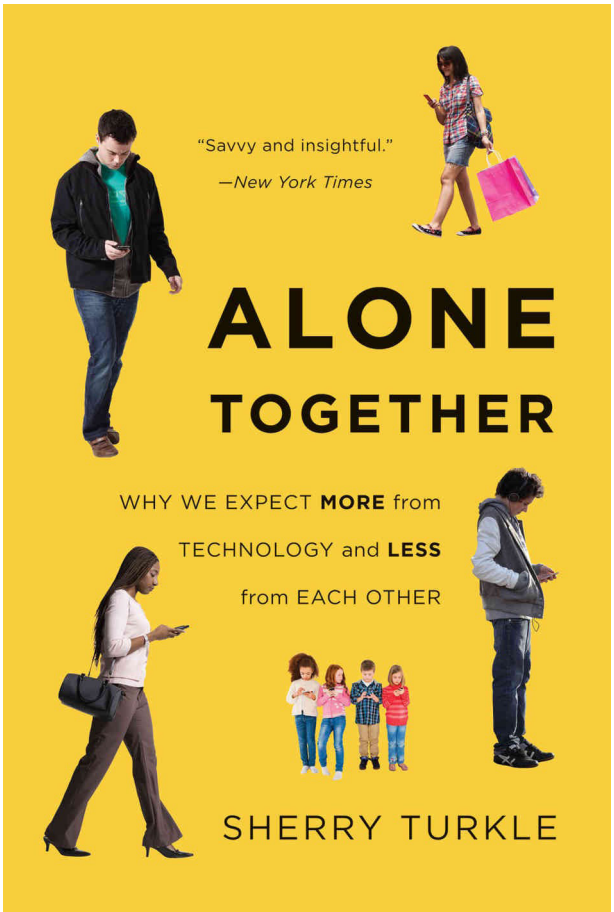


Figure 3.10 "Reclaiming Conversation" & "Alone Together", books written by Sherry Turkle



Sherry Turkle, Professor of the Social Studies of Science and Technology at the Massachusetts Institute of Technology has spent more than 20 years researching the effects technology can have on ourselves. What she came to realize is that we are more and more losing these times of necessary solitude as we let ourselves constantly be distracted by the small computers we carry everywhere around us.

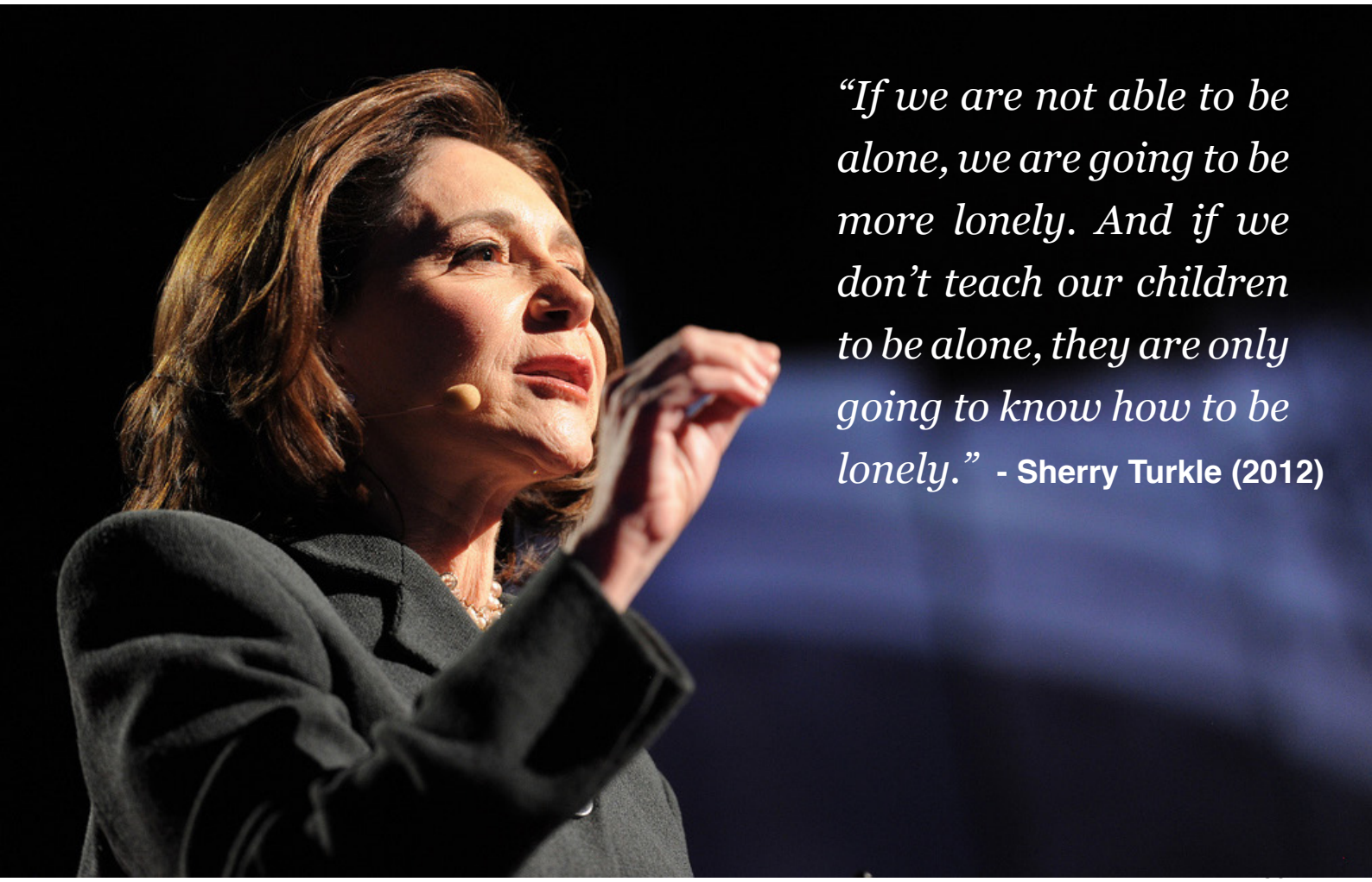
Turkle (2012) argues that cultivating this capacity for solitude is key to a healthy self-image, because it is the place where we find yourself, and it is from that place that we can reach out to other people and create real connections that come from intrinsic interest and curiosity, and not out of a need to alleviate our own anxieties or negative feelings.

From her research mostly done with adolescents, she observes that younger generations are becoming more and more afraid of intimacy and true conversations, as they seem to sacrifice them for mere virtual connections. Sadly, these connections are not intimate enough and will not allow them to really learn and understand each other.

We mentioned that the technologies we have built have created a mismatch. As Turkle says it, they created the illusion of companionship making us turn to our smartphones to fill the social void and to help us feel connected. (Turkle, 2012).

Social networks give the idea that we will never have to be alone. Their addictive nature in combination with our fears of being lonely make us reach to a device, out of panic, out of anxiety when being alone, even when we have to wait for a few seconds we reach to a device.

Turkle emphasizes that nowadays being alone feels like a problem that needs to be solved, and that people try to solve it by connecting. But here connecting is not the solution, merely a symptom. A symptom telling us we feel isolated (Turkle, 2012).



3.3 Literature Study Overview

A more clear overview of the existing literature and developments regarding our relationships with smartphones has been given. For this overview a recapitulating list of the 15 most interesting and strong scientific facts has been made, which will be taken along and later be used as basis to create the design framework.

Main Findings

Cognitive

1. Presence of smartphones reduce available cognitive ability. (Ward, Duke, Gneezy, Bos, 2017)

2. Using phones in the classroom has been shown to impede learning performance. (Wood, Zivcakova, Gentile, Archer, De Pasquale, & Nosko, 2012).

3. Smartphone notifications increase inattention and symptoms of hyperactivity. (Kushlev, Proulx, & Dunn, 2016).

4. Distraction can reduce the ability to enjoy and derive pleasure in positive experiences. (Brown & Ryan, 2003; Quoidbach, Berry, Hansenne & Mikolajczak, 2010).

Psychological

5. Smartphones & social media are addictive. (Zhang et al., 2014; Salehan & Negahban, 2013).

6. High use creates an increased risk of experiencing prolonged stress & symptoms of depression. (Thomée, Eklöf, Gustafsson, Nilsson, Hagberg, 2007).

7. Smartphone usage amongst adolescents creates sleep disturbances & higher causes of mood disorders. (Thomée, Eklöf, Gustafsson, Nilsson, Hagberg, 2007).

8. Flow, instant gratification & mood regulation positively affect uncontrollable smartphone use. (Zhang, Kem & Chongyang, Chen & J. Zhao, Sesia & Lee, Matthew, 2014).

9. Separation from smartphones can cause symptoms of anxiety for moderate & high users. (Cheever, Rosen, Carrier, Chavez, 2014).

Physiological

10. Sending and receiving text messages causes shallow breathing, increase in heart rate and muscle tension. (Lin & Peper, 2009)

Social

11. Smartphones reduce smiles between strangers. (Kushlev, Proulx, Hunter, Pressman, Dunn, 2019).

12. Smartphone use undermines enjoyment of face-to-face social interaction (Dwyer, Kushlev, Dunn, 2018).

13. The presence of smartphones is associated with less social impressions and lower quality of conversation. (Vanden Abeele et al., 2016; Brown et al., 2016; Misra et al., 2014).

14. High smartphone use encourage the loss of solitude, important for coping mechanisms, reflection and understanding the self. (Turkle, 2012; Koch, 1994; Storr, 1989).

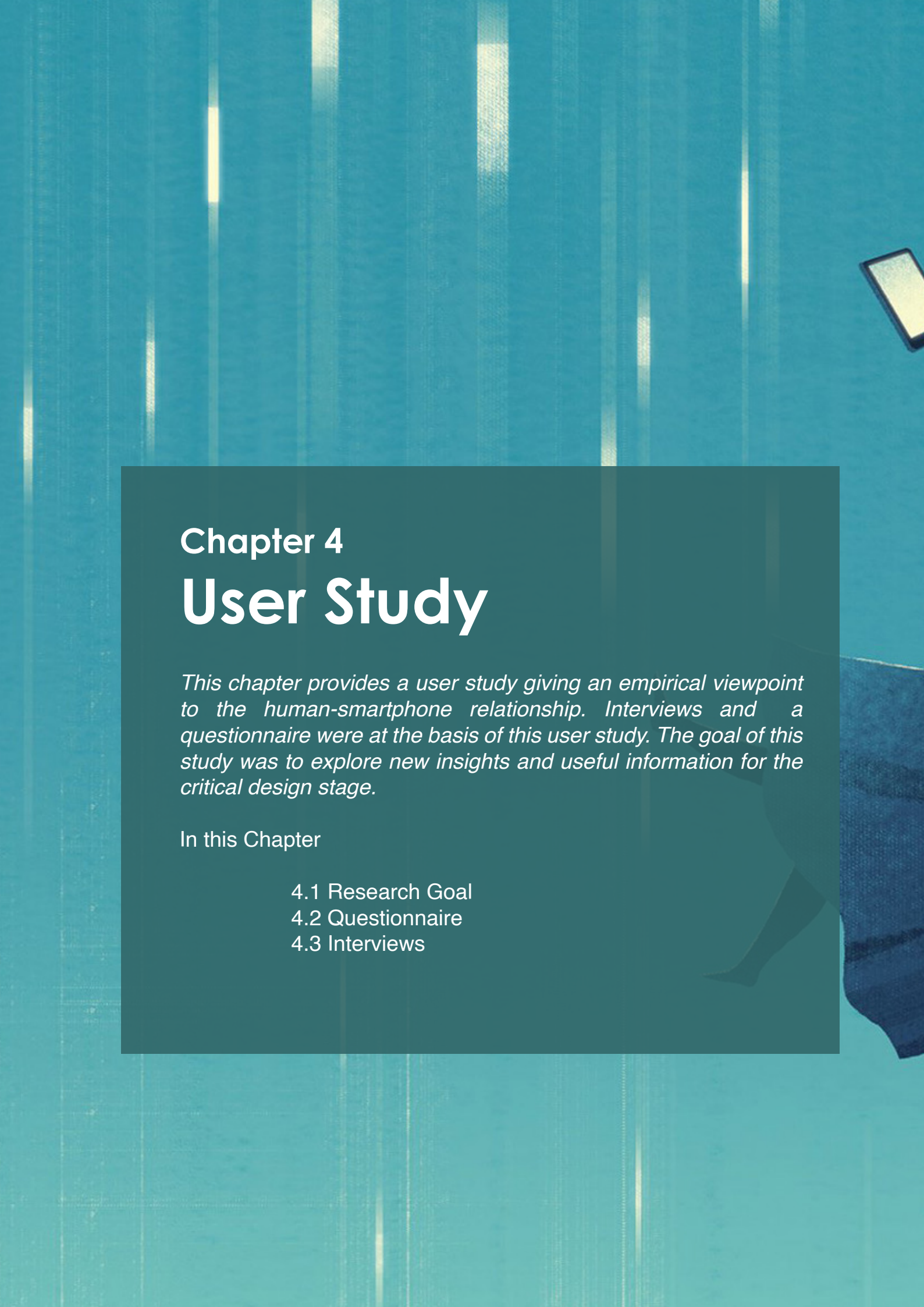
15. Smartphones and social networks cue the same processes of self-disclosure and responsiveness we need to create qualitative relationships, but without the beneficial intimacy developments creating the real fertile ground that build them. (Sbarra, Briskin & Slatcher, 2019).

Conclusion

The already existing and growing amount of literature related to our health in combination to smartphones tells us our behaviors should not be taken lightly. With every positive side comes a negative one, and one may argue the negative side is starting to take the overhand. From addiction to anxiety and depression, as paradoxical as it may seem, the same devices that are supposed to connect us to one and other are the ones that create the opposite effect. Our smartphones reduce our likeness to smile to a stranger (Kushlev et al., 2019), take our attention away from our direct environment, and have been shown to reduce the quality of ones connection and quality of conversation with another when being interrupted (Dwyer et al., 2018). We are being tricked into sharing and responding to our peers, but unfortunately without the benefits of real conversations that build social capital and connections (Turkle, 2012).

Whats next?

The literature gave convincing information and insights about the existing effects and developments, but it will not be sufficient for a complete design framework. The user study will give insight in the context and the interactions, from a more subjective viewpoint. Adding to a solid basis to start framing the design brief.



Chapter 4

User Study

This chapter provides a user study giving an empirical viewpoint to the human-smartphone relationship. Interviews and a questionnaire were at the basis of this user study. The goal of this study was to explore new insights and useful information for the critical design stage.

In this Chapter

4.1 Research Goal
4.2 Questionnaire
4.3 Interviews

Background Image by Jaso Hu for the Atlantic

4.1 Research Goal

The goal of the user study is to get insight in how people relate to their smartphones, to gain an understanding in their relationships, their behavior, their thoughts and how they feel about them. As it is a very broad topic and as it contains many different areas, the intention of this user study is to create understanding based on a more empirical and subjective approach, to later combine these with the scientific literature and find meaning.

Method

The literature study helped us gain a very scientific understanding of the existing problems related to smartphones. A more empirical viewpoint will help us gain understanding in how people actually think and feel around their smartphones. For that purpose a questionnaire and interviews were used as methods.

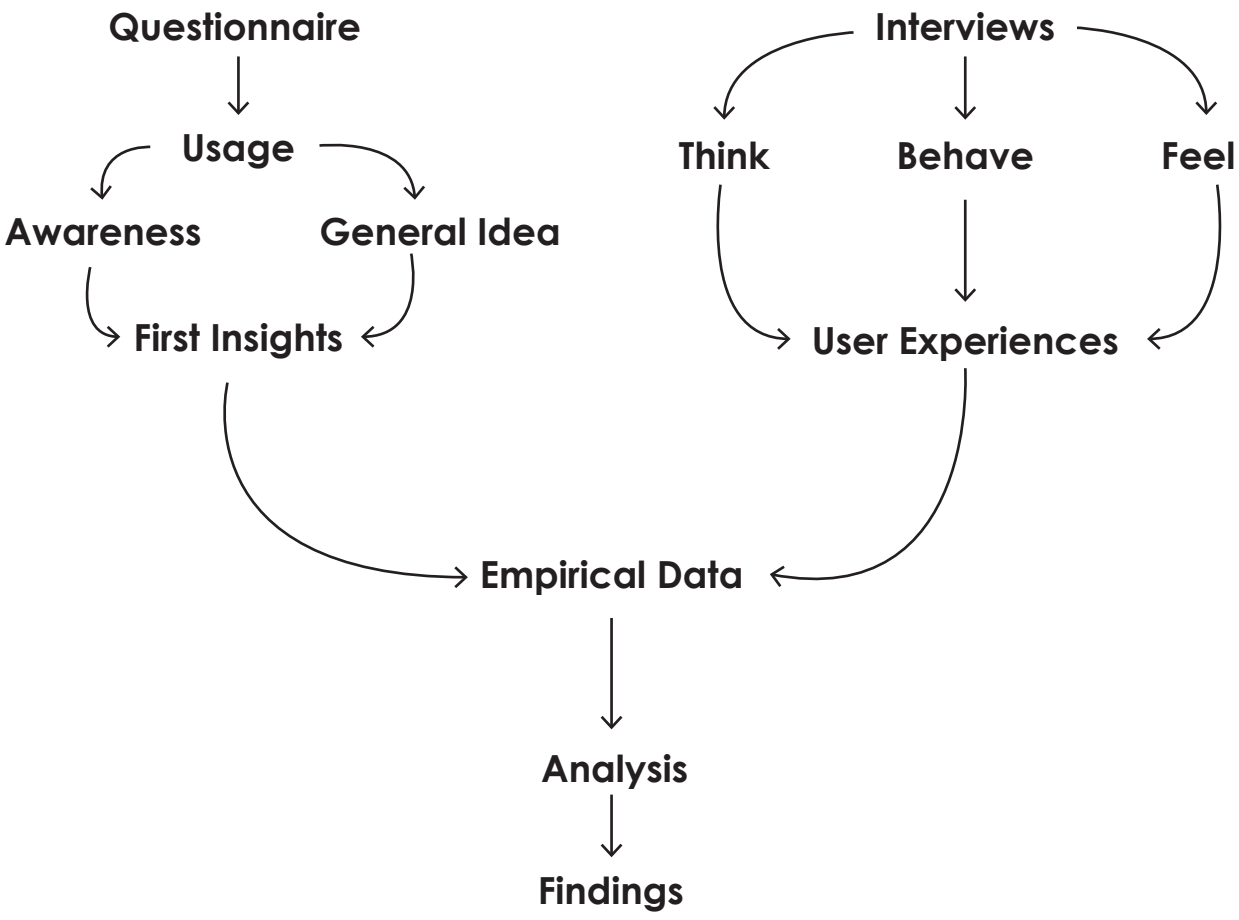


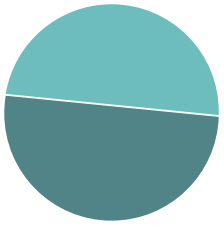
Figure. 4.1 Visual of the User Study approach

4.2 Questionnaire

In order to get a first insight into the way peers, acquaintances and relatives think about smartphones and their behavior, a survey was conducted with a total of 20 questions. The questionnaire was made in Google Forms and shared through social media. The intention is to gain understanding but also compare these results with the scientific facts, to see if there are any overlaps, gaps or inconsistencies.

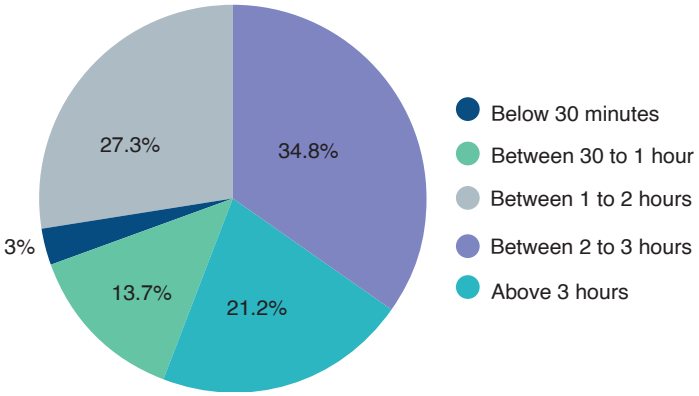
4.2.1 Demographics

66 participants

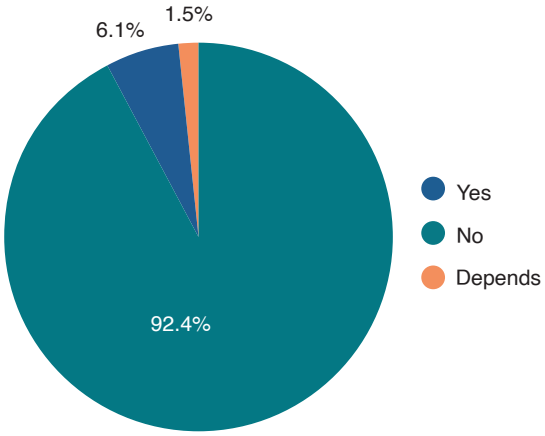


Age distribution

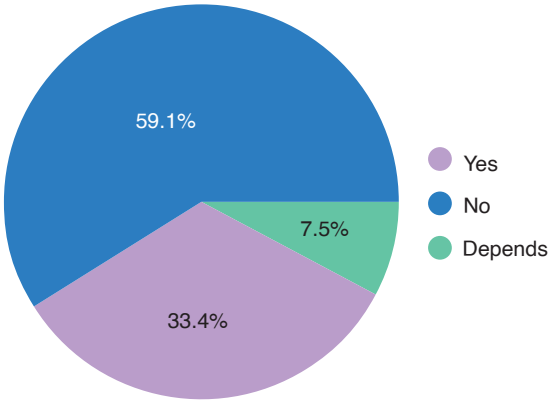
4.2.2 Results



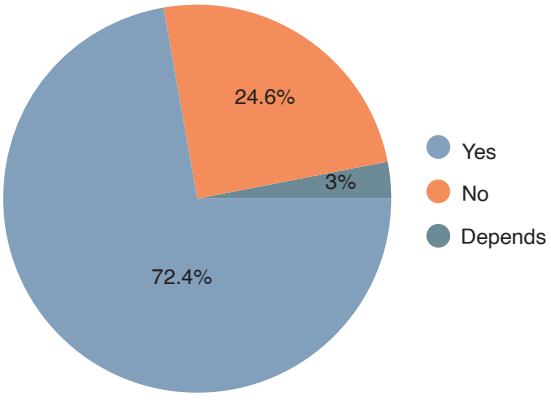
Daily Usage (Including music, videos etc)



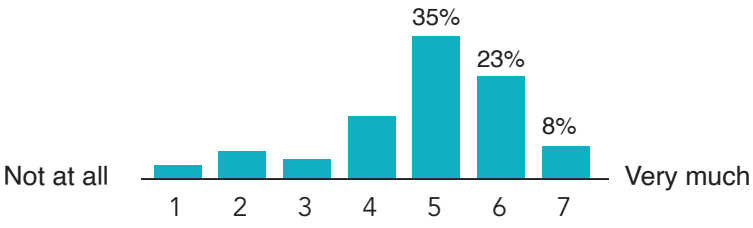
Is it necessary to be connected 24/7 ?



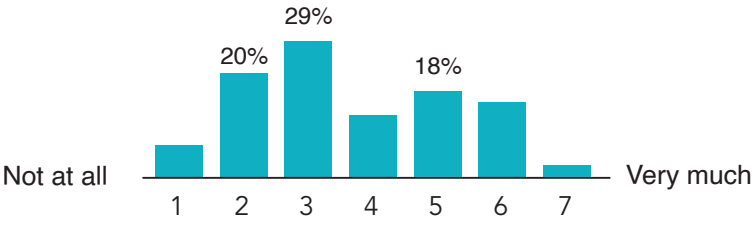
Are you connected 24/7?



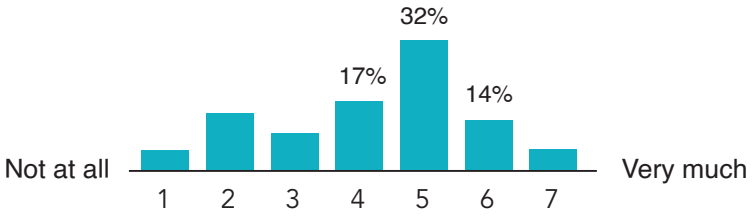
Does your smartphone cause interruptions in daily activities? (Classes, sleep, socialization, eating?



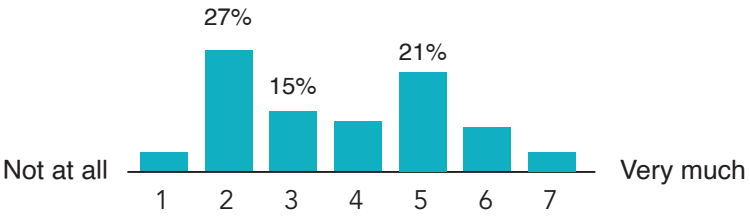
Perceived amount of procrastination caused by smartphones



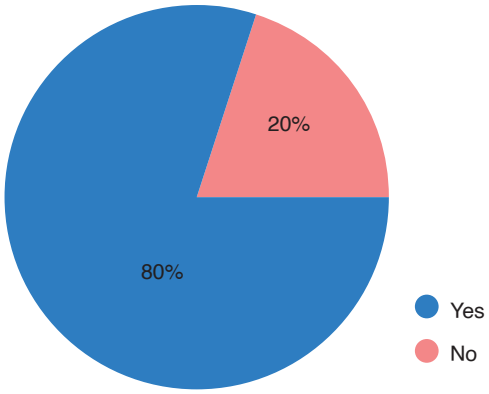
Perceived amount of stress caused by smartphones



Felt guiltiness towards other activities caused by smartphone usage



Felt hinder towards achieving daily tasks caused by smartphone



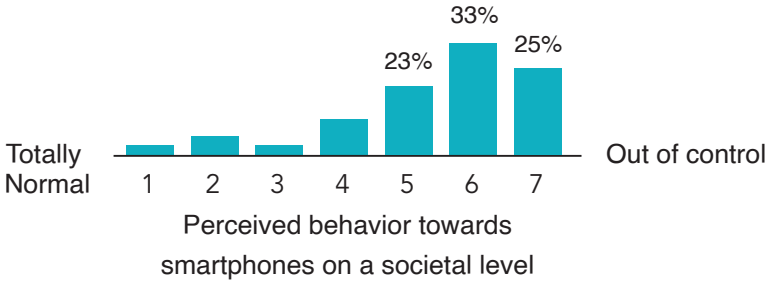
Do you believe you are attached to your phone?

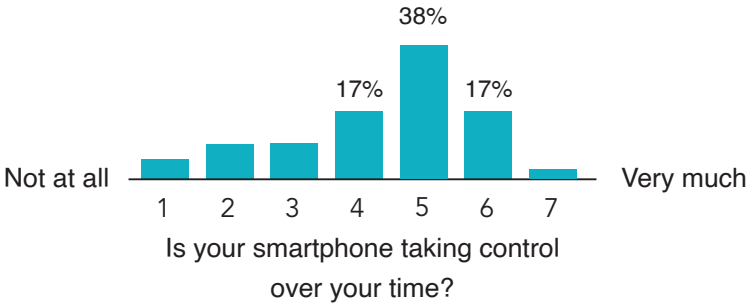
Interestingly, more than 50% of the participants uses their smartphone for more than 2 hours a day, and part of that group are 21,2 % who spend even more than 3 hours. From the 66 participants 92,4% said it is not necessary to be connected 24/7, but still almost 34% is.

With such a high use, interruptions are inevitable. 72,4% of the participants answered that their smartphone was causing interruptions in daily activities such as classes, sleep, socialization, and eating.

If we take a closer look at the scaled graphics, we can see the majority of the participants is experiencing negative effects caused by their smartphones. More than 60% rated their perceived procrastination due to their smartphone a 5 or higher. Around 50% feels guilty towards other activities. The perceived amount of stress and hinder felt towards achieving daily tasks is more or less equally distributed.

Considering these results, 80% of the participants said they are attached to their phone.





In addition to the preview results, a fair amount perceives our behavior towards smartphones as "Out of Control" on a societal level. 81% of the participants gave this scale a score of 5 or higher. In total 73,5% answered a 4 or higher that their smartphone was taking control over their time.

We can say there is an awareness of the effects smartphones have on their lives and behaviors.

4.2.3 Open answers

The participants were asked what they experienced when they would not know where their phone was or when it went out of battery: Below are the most interesting results.

"Little panic"

"Freedom"

"Irritation"

"Relief and stress at the same time"

"It's nice and quiet"

"Discomfort"

"Worried, Isolated."

"I want to find it back immediately"

"Anxiety"

"Annoyance"

"Relieved"

"Moment of shock"

"Like something is missing"

"A weird sense of freedom"

"Frustrating" (x5)

"Annoyed, fear of missing out"

"A sight of the void"

"I experience some kind of stress (14 times)"

"The phone era makes people be more isolated, especially between (commuting) strangers"

"Depends on how long, but it might concern me"

"Great! Finally I won't have to worry about it anymore"

"I'm getting a bit stressy, but I got my charger always with me."

"I will find it, I just have to make sure that it is close to me."

"First it feels like I have a physical disability, because I miss something, afterwards I feel relieved"

The participants were asked what the benefits were they got from their smartphones; below you can read the most interesting answers.

"Stay in contact with family & friends" (x16)

"Learning tool"

"the Internet"

"Fast and easy to use"

"Freedom, working remotely"

"Escape boredom"

"All the information"

"Always connected"

"Fast communication & Amusement"

"Entertainment"

"Gaming where-ever"

"Distraction, staying up to date"

"Everything in one place"

"Stay up to date"

"I can take it anywhere"

"It is just another world in your pocket"

4.2.4 Insights and Findings

The results of this questionnaire give us a better understanding how the participants perceive smartphones. A few things are quickly obvious;

Duality

The duality in the experiences, participants have positive but also very negative associations with their smartphones, this will later be emphasized through the interviews.

Awareness

We can see there is a definitive awareness of the obtrusions the devices can bring, from experiencing guiltiness towards other activities, procrastination but also being aware of a dependency.

Responses

A high amount of alarming stress and anxiety responses whenever the smartphone is lost or out of battery; these responses correspond with the literature from Cheever et al., (2014). and are in line with symptoms of addiction.

Benefits

Participants also experience a lot of benefits from their smartphones.

Societal Awareness

There is a societal awareness of the situation and our behaviors towards smartphones.

4.3 Interviews

Five in-depth interviews were held in order to get a richer understanding of the current perspectives and relationships towards smartphones. A set of guiding questions were used along the interviews, leading to very rich & fruitful conversations.

Participants

Four one hour long in-depth interviews and one three hour long interview with an expert were held.

>> Age range : 21 to 42 years old.
>> 1 female and 4 males.
>> Dutch Nationality
>> Smartphone owners.

Setting

Settings changed from work environment to people's home, to a long city walk. The expert interview was held in Groningen and went on for about three hours. The other interviews lasted around 1 hour.

Tools

A prepared list of twelve questions was used to guide the interviews, which can be found in Appendix (A) These questions were open questions and had as goal to start in-depth conversations about personal to more societal viewpoints.

Data

A total of 8 hours of interview material was collected. Accompanied with notes taken during each interview, the material was transcribed digitally to written text. The text was analyzed and findings/ insights were extracted.

4.3.1 Findings

Meaning

For each participant, the smartphones means much more than just a simple device, and the relation one has with it is a very complex one. But in a very broad sense, it is a very useful tool to them, and is used to navigate, communicate with people, look up information and as entertainment.

"My phone is a resource for me that I use to reach out to people, but it's not my primary medium to communicate.."

- Participant 2

Meaningful Communication

For most of the participants, a lot of communication that goes through their smartphones is not necessary or meaningful. Especially all the group chats seem to create an over-stimulation in messages. In all the cases, every participants wished there would be less meaningless chatting.

"30% of all the communication that goes through my smartphone is meaningful, the other 70% should be done in real life."

- Participant 2

Networking

Smartphones are great tools to communicate and stay in contact with each other, to use as a tool to set a meeting or a gathering (with people you already know). Every participant strongly benefits from it in that sense. Participants did report that it will never replace real face-to-face communication, as there are no emotions or feelings involved in virtual communication.

"It helps me to get in contact with someone, but it doesn't strengthen the relationship"

- Participant 1

Availability

All participants had trouble with availability and the expectation to always be reachable or answer messages. For every participant it was clear that they wanted to be in control whenever they would like to answer a message or a call, or themselves decide to engage in pro-social behavior. Unfortunately, this was sometimes difficult as all participants said that it was expected from them to be reachable, by your employers, family, friends.

"It gives me an unpleasant feeling, that it is somehow expected from me to be reachable at all times."

- Participant 3

"It is so annoying! You are with and your direct environment; and nothing should be important enough to break that!"

- Participant 4

This issue seemed to go deeper. Every participant talked about the expectation to be available as if it had become a societal norm, something that is expected from you. This seemed to clash with their own needs, to have some quiet time or a moment for themselves, but especially as they are being interrupted several times a day while focusing on other activities. To counter this issue, participants put their phones on silent, deactivated all sorts of pop ups on the front screen, and some even bought a watch to look at the time instead of on the screen. Interestingly, even with these measures taken, it still occupied a part of their attention and costs some mental effort, as they knew some messages, calls or other things were coming in.

"It became an automatic thing, I literally catch myself looking at my phone again although I have no need for it at all.."

- Participant 1

Having Control

Participants reported that they tried to reduce their daily smartphone time, used less social media and used timers to restrict themselves from that kind of behavior. This highlighted the fact that in some way, they lost control over their own behavior. There seemed to be a friction as they were very well aware of this. As reducing or completely stopping using social media or diminishing their daily use did not always work, a follow up reaction to that was negative self-judgment.

"You want to have control over it, but you can't really, so you judge yourself. And you start to feel bad about yourself. "

- Participant 4

Things we Lost

Every participant was able to see the benefits of what smartphones have brought to us, but were as well aware of the things that we might be losing due to them. In each interview, participants reported that we have become more individualistic, and that we are losing a certain amount of real social contact.

"We can also do without, and that's what I would like to see.. We are much more self-absorbed and wrapped up in our own worlds."

- Participant 2

Participants reported that there is much more to a real physical relationship, that it is much stronger and goes much more into depth, and is sustainable. Phones cannot replace that, and a non-physical relationship or one that tries to replace it virtually was something participants doubted to be a positive thing.

The feeling of discovery was also reported to be something participants missed. Especially when traveling, when using your phone as a travel guide, participants reported that a lot feels very preprogrammed, without the romantic touch of ending up in an adventure or discovery.

The Future

"A lot is going to change , and not just positively I think. I don't know if the world is becoming a more fun place to live.."

- Participant 1

Thinking about future generations, participants exchanged a lot of words with me regarding children and younger generations. They believed that children nowadays were playing much less outside but also less with other kids due to smartphones and other technology, leading them to be less and less skillful at reading emotions and becoming socially skillful. This can have tremendous effects on learning to build strong relationships, which in turn may have strong impact on mental health in the long run.

Expert Interview

While doing my literature study, I arranged an interview with Ritzo ten Cate. He is a "Social Engineer" who got alot of attention in the media with his photo series called "Caught in the App". I met with him and we talked for more than 3 hours about the effects of smartphones and how they are changing society.

Caught in the App

What Ritzo told me is that he started seeing how unaware people could be of there surroundings while walking on the street and looking at their phones. He started photographing these people, by standing right in front of them (see figure 4.2 & 4.3). At the moment they would realize that he was standing there, (when they would almost walk into him) he would take the shot. He took more than 500 of these pictures.

"After capturing more and more people, I started seeing how unhappy they all looked. "

The pictures were the starting point for him to start looking deeper, questions he wanted answers to were; How healthy is our relationships to smartphones? And what can we do to make that relationship healthier? After speaking with experts and reading the relevant literature, he concluded that this relationship we have is not so healthy. A lot of people feel addicted and experience hinder. But the true problem seemed to be that we are de-socializing as a society, and the consequences are becoming apparent. Feeling unhappy, feeling lonely and more and more depression.

Social Engineering

Ritzo tries to make society a more social one. His initiative starts within himself, as he looks around him and sees things that disturb him. One of these things is the omnipresence of smartphones and how they affect us in a social way. He tries to change the dynamics in a part of society and make it more fun, make it happier, better and more beautiful. How does he make that happen? By taking his time and mobilize a whole city or even the country. With his photo series "Caught in the App" (figure 4.2) he got media attention worldwide, from the Netherlands to Germany to even Japan. Even Sherry Turkle (see page 37) contacted him for his photography. Why did these pictures get so much attention?

Multi-Living

What Ritzo mentioned is that we are somehow "multi-living" ; we are able to switch from one world to another by one click. So in a very boring meeting , you can move to a very interesting and lively chat with your friends. Or with one swipe, you can be with your future wife, or maybe the next swipe, or the next swipe.. Of course it feels great to be traveling at the speed of light, all over the world, but if you are in one place, and then another one, what remains over here, in the present moment?

With our short attention spans, we can only be in one place at a time, so almost nothing remains in the present moment. According to Ritzo, the problem goes beyond a few traffic accidents, we are really disconnecting our future. The core of why the devices are so powerful lays in 5 different aspects.

1) Multi-super tools; We can almost do everything with them, from banking to communicating to finding your way and much more.

Figure 4.2 Pictures from the photoseries “Caught in the App”

Figure 4.3 Pictures from the photoseries “Caught in the App”

2) They are free; After you bought one, you can keep using them forever, as long as you want.
3) There is always more; There will always be more pictures, more messages, more information..
4) They are hyper social; We keep pulling each other in. Communication goes both ways.
5) They are addictive. The apps are made to be.

Intrinsic Motivation

What motivates him to get people together and make society more social comes from his youth. Ritzo told me he grew up in a village that was so small, that he was literally the only kid in the classroom, and that for a few years in a row. Seeing society being polarized and desocializing in combination with his youth became a call to action for him. To conclude, this interview was very inspiring, and it became much more a conversation along the way. What Ritzo confirmed to me were a lot of the insights I had also found through my literature study.
But for Ritzo there is no solution yet, as it is a very complex and big problem we are facing. His first step is to start the conversation and becoming aware of the problem. In a way, this resonates with the purpose of this graduation thesis.

Chapter 5

Design Framework

In this chapter all the information gathered in the previous stages will be used to create a clustered, informative design framework that can be used as a basis for the idea generation and design concepts for the Critical Design Collection.

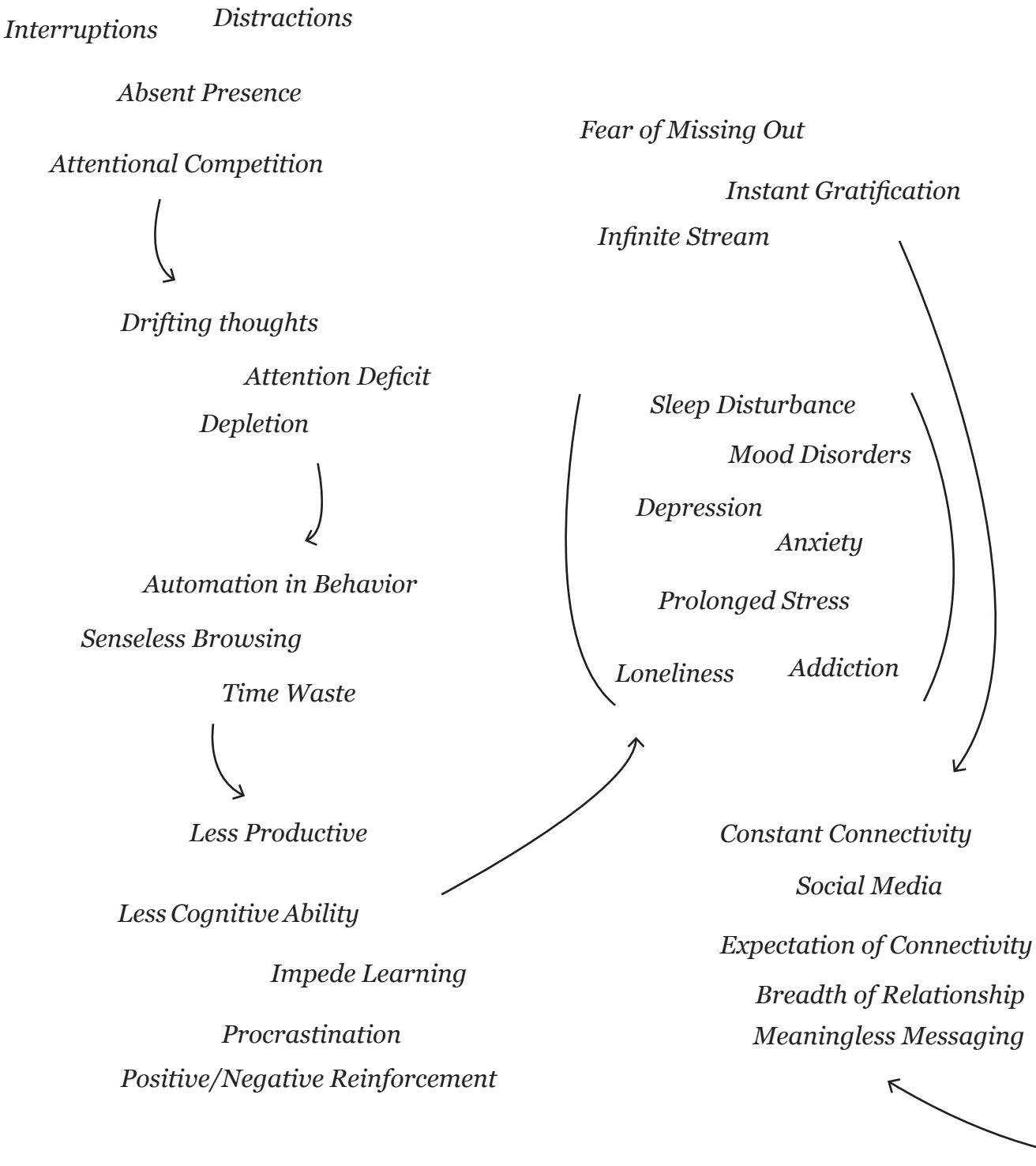
In this Chapter

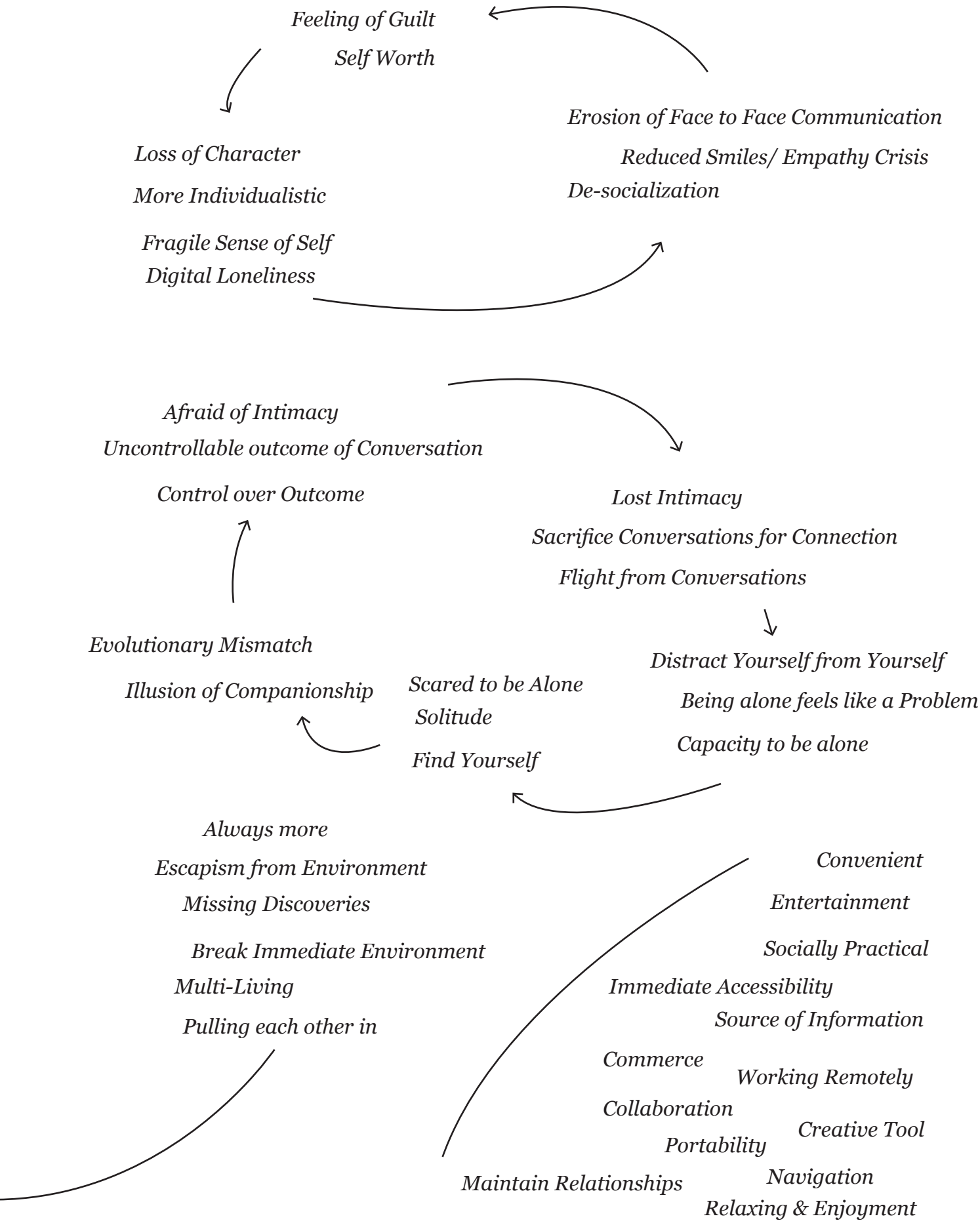
5.1 Data Clustering
5.2 Cluster Definement
5.3 Smartphone Manifesto

Background Image - Mobile Phone Lovers/Street Art by Banksy

5.1 Data Clustering

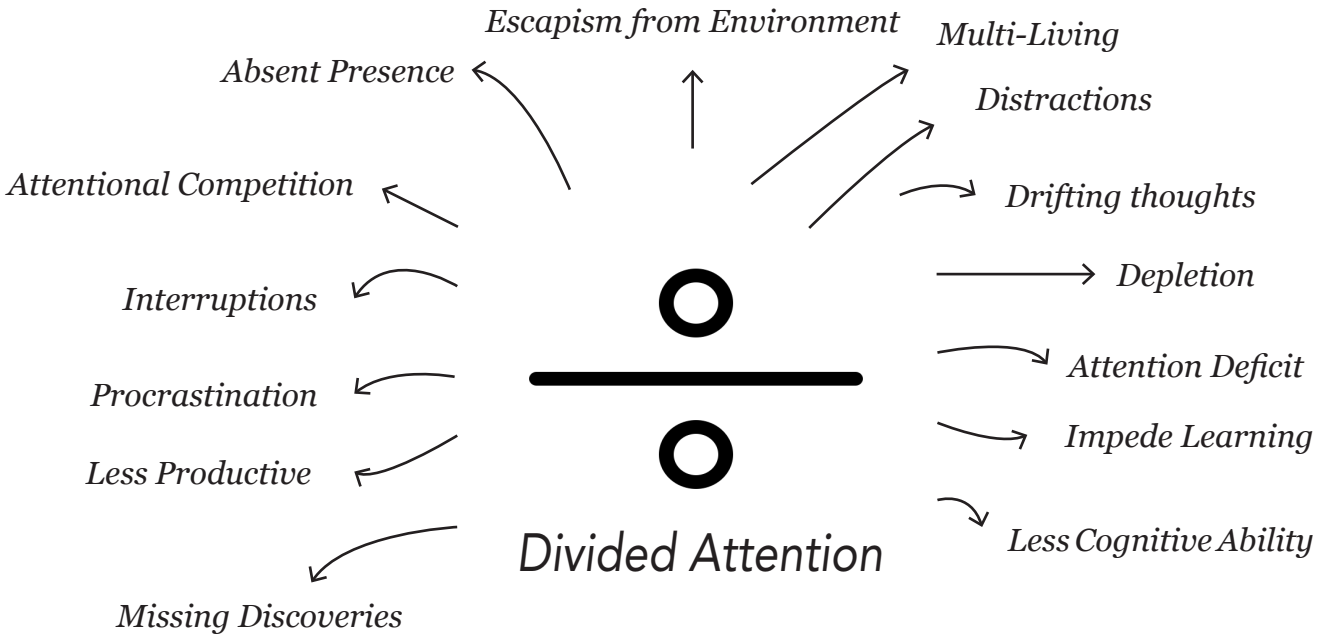
In order to gain understanding, find meaning and create clusters, all the insights and valuable information are written down, to create a visual overview. The next step is to cluster this information into interesting themes that can be used as basis for the critical design phases. These themes will overlap with each other but at the same time stand alone in how they summarize a different area. On the next page, these themes are clustered.

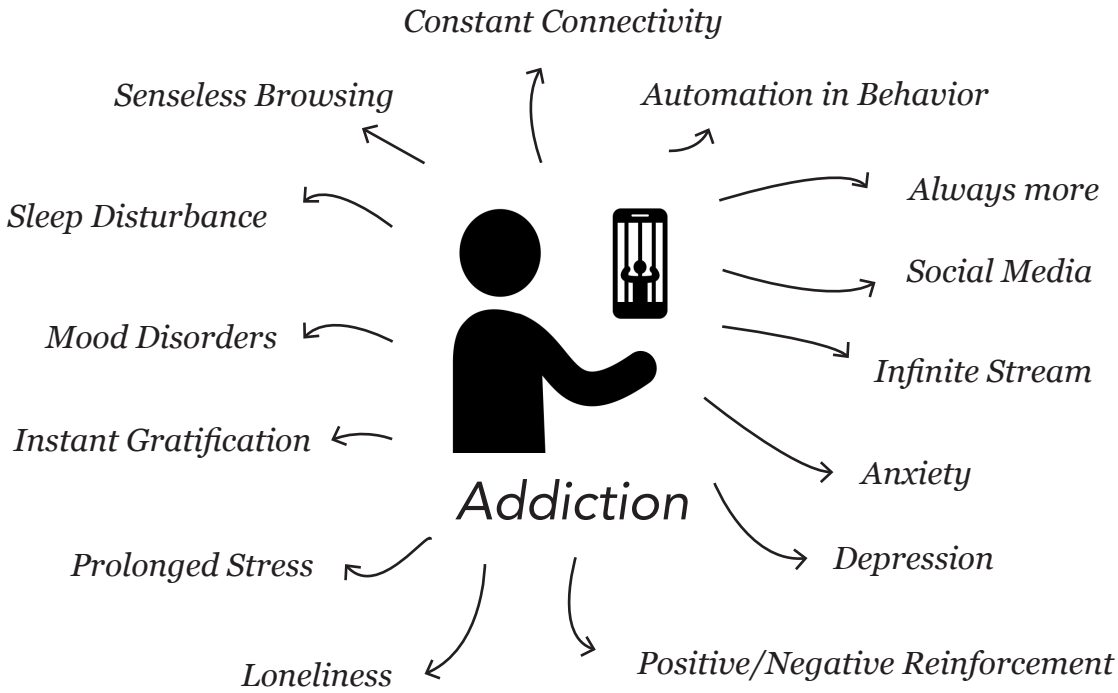


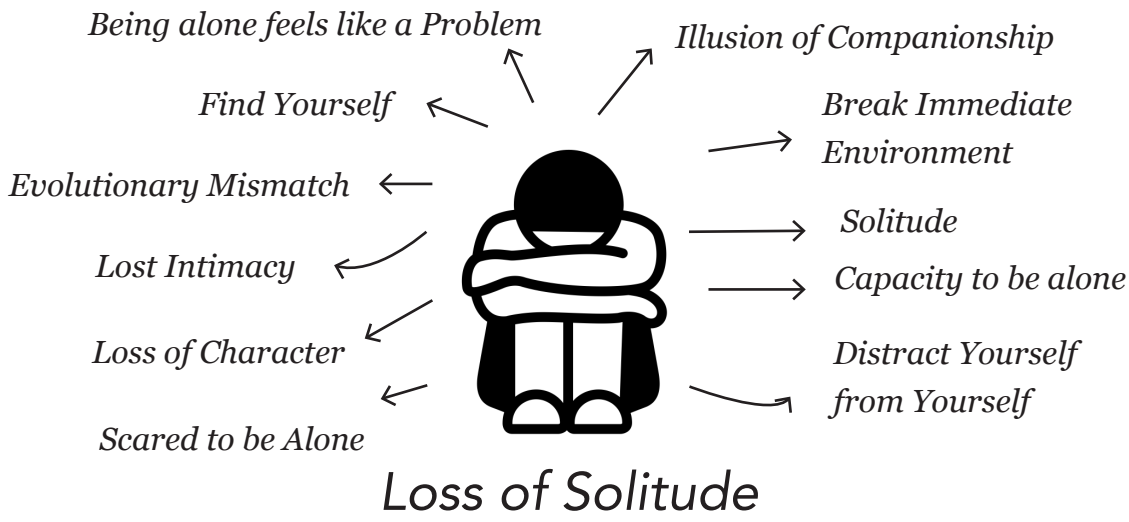

Feeling of Guilt
Self Worth
Loss of Character
More Individualistic
Fragile Sense of Self
Digital Loneliness
Erosion of Face to Face Communication
Reduced Smiles/ Empathy Crisis
De-socialization
Afraid of Intimacy
Uncontrollable outcome of Conversation
Control over Outcome
Lost Intimacy
Sacrifice Conversations for Connection
Flight from Conversations
Evolutionary Mismatch
Illusion of Companionship
Scared to be Alone
Solitude
Find Yourself
Distract Yourself from Yourself
Being alone feels like a Problem
Capacity to be alone
Always more
Escapism from Environment
Missing Discoveries
Break Immediate Environment
Multi-Living
Pulling each other in
Convenient
Entertainment
Socially Practical
Immediate Accessibility
Source of Information
Commerce
Working Remotely
Collaboration
Creative Tool
Portability
Navigation
Maintain Relationships
Relaxing & Enjoyment

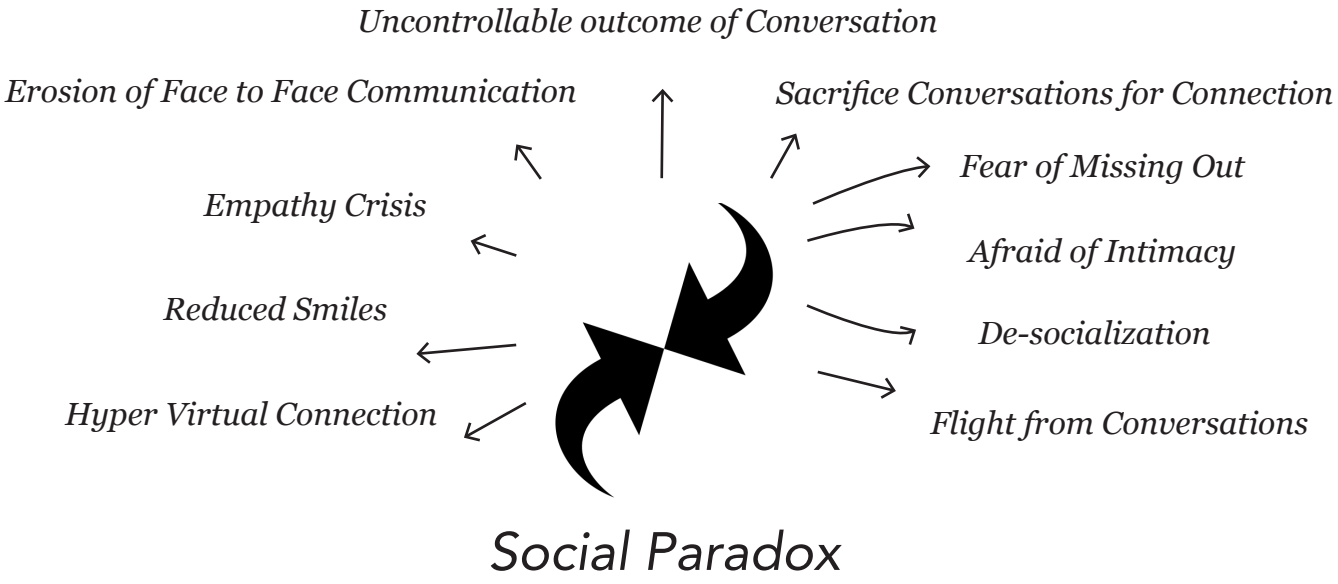
5.2 Cluster Definement

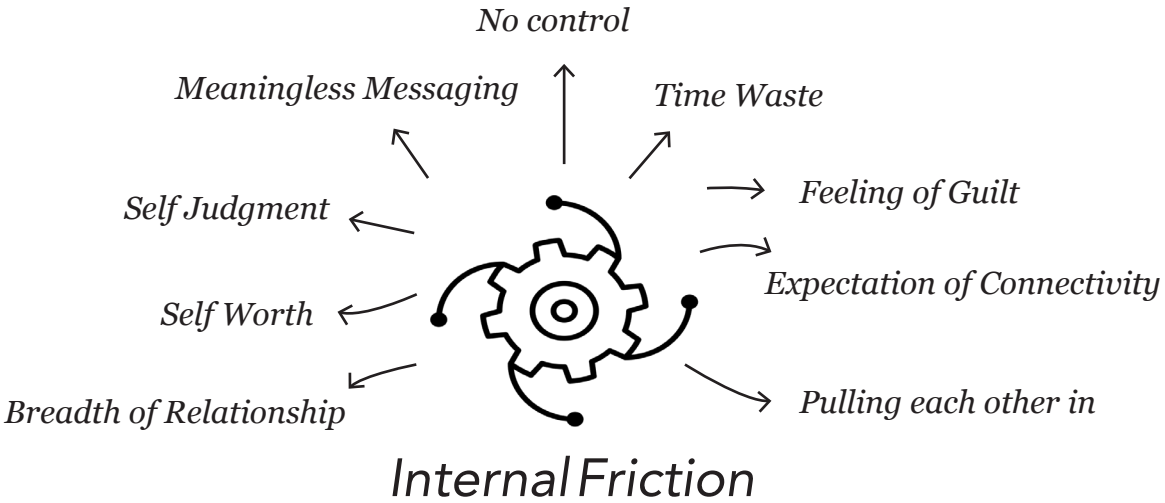
To find order in the chaos, it is necessary to create clusters or themes. In other words, we need to zoom out and summarize all the bits of information we found in our research to make it understandable, organized and clear. As we are focusing on creating a series of critical designs, the choice was made to focus on the more negative effects, meaning the benefits found will not be made use of. On the next page, each theme will be defined as a bigger movement we are seeing in society, having each its own scientific and empirical evidence that reinforces its validity. For each theme, two or three interesting scientific facts are chosen that are the most interesting and usable for the idea generation.






Being alone feels like a Problem
Illusion of Companionship
Find Yourself
Break Immediate Environment
Evolutionary Mismatch
Solitude
Lost Intimacy
Capacity to be alone
Loss of Character
Distract Yourself from Yourself
Scared to be Alone
Loss of Solitude


Uncontrollable outcome of Conversation
Erosion of Face to Face Communication
Sacrifice Conversations for Connection
Fear of Missing Out
Empathy Crisis
Afraid of Intimacy
Reduced Smiles
De-socialization
Hyper Virtual Connection
Flight from Conversations
Social Paradox


No control
Meaningless Messaging
Time Waste
Feeling of Guilt
Self Judgment
Expectation of Connectivity
Self Worth
Pulling each other in
Breadth of Relationship
Internal Friction

The Smartphone Manifesto

This manifesto has been written to summarize all the findings. It describes five topics that are of great importance within the developments and effects smartphones are bringing into society and to us. This manifesto is the catalyst to action, and the fundament of the idea generation.

The Social Paradox

The Loss of Solitude

Internal Friction

Your Divided Attention

The Addiction

The Social Paradox

Figure 5.1 Removed Series - Eric Pickersgill

"Smartphones and Social Media have permitted us and made possible constant connectivity, allowing us to be in touch and connect with people all over the world, where and whenever we want. But how paradoxical it may seem, the one device that keeps us connected with everyone, distracts us from the real life pro-social behavior that creates, forms and maintains the social relationships we need for a healthy social life."

Scientific Evidence

1. Smartphones reduce smiles between strangers (Kushlev, K., Hunter, J. F., Proulx, J. Pressman, S. D., Dunn, E., 2019).

2. Smartphone use undermines enjoyment of face-to-face social interaction (Dwyer, Kushlev, Dunn, 2018).

"Our social instincts trigger us into social media and make us sacrifice real conversations for mere connection."

The Loss of Solitude

Figure 5.2 Removed Series - Eric Pickersgill

"Smartphones have created a door towards endless distractions, diminishing the time we spend alone, in solitude, the place where we find ourselves and learn how to understand who we are. We have forgotten the importance of solitude and boredom, a key ingredient to intra-personal flourishing, but also to vital social relationships."

Scientific Evidence

1. High smartphone use creates a loss of solitude and boredom (Turkle, 2016).

2. Boredom and Solitude are important for coping mechanisms, reflection and understanding the self, but also important for mental and emotional stability. (Turkle, 2012; Koch, 1994; Storr, 1989).

"Boredom is a mental state we choose to avoid, to escape from self-reflection."

Internal Friction

Figure 5.3 Removed Series - Eric Pickersgill

"We are all aware of our own behaviors and the ones in society related to smartphones. Users don't seem to have agency over their spent time on certain apps and there is an inconsistency between wanting to be connected and the expectation/obligation to be, which creates an internal friction. We would like to put have the freedom to put them away, but society asks us to the opposite".

Scientific Evidence

1. The apps we spend the most time on make us the most unhappy (Center of Humane Tech & User Study).

2. The more we use our phones, the more concerned we become with our own usage (Deloitte, 2018; User Study).

"Wanting to be in control and realizing we are not capable to be, creates the self-judgment and feelings of guilt that entail our internal friction."

Your Divided Attention

Figure 5.4 Removed Series - Eric Pickersgill

"Smartphones and applications are engineered to compete for your attention, or in other words, our time. The devices and softwares are becoming better and better at persuading you to use an application and to stay there for as long as possible (Harris, 2017). These distractions and interruptions manifest themselves in the form of messages, notifications, sounds and alerts, pulling you away from your direct environment and into your phone.

Scientific Evidence

1. Presence of smartphones reduce available cognitive ability (Ward, Duke, Gneezy, & Bos, 2017).

2. Distractions can reduce the ability to derive pleasure from positive experiences. (Brown & Ryan, 2003; Quoidbach, Berry, Hansenne, & Mikolajczak, 2010).

3. Texting and answering messages/email's causes an increased heart rate and shallow breathing (Peper & Lin, 2009).

"If a clear calm water reflection of yourself was your focus, the effects of divided attention is the water being interrupted by multiple raindrops, blurring your ability to see clearly and focus."

The Addiction

Figure 5.5 Removed Series - Eric Pickersgill

"Smartphones and social media are addictive. They are built and designed to create dopamine releases in the brain, playing a major role in the motivational component of reward-motivated behavior."

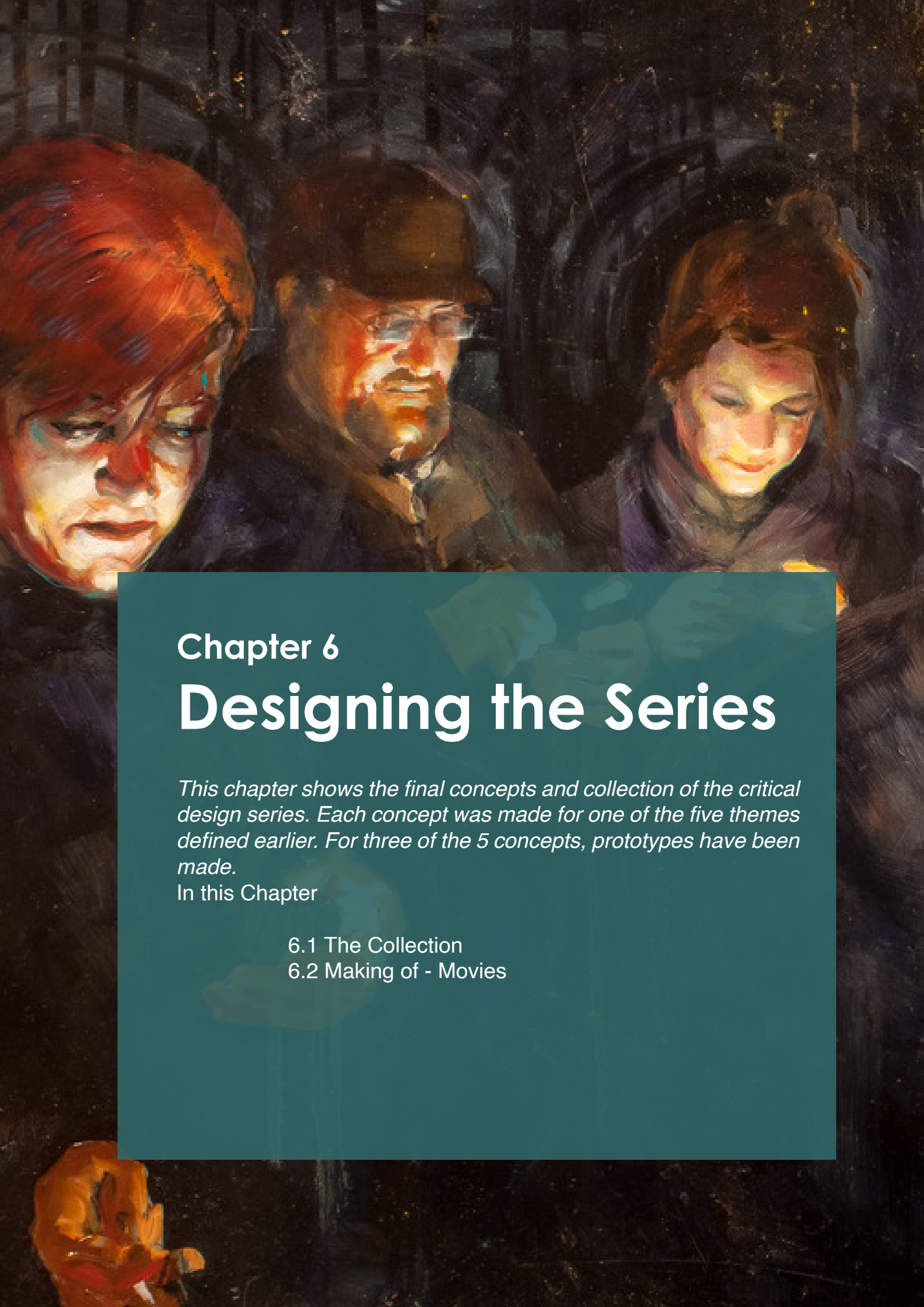
Scientific Evidence

1. Waking up with your phone may increase stress levels and can make you feel overwhelmed. The information overload also interferes with your ability to prioritize tasks and your productivity (Dr. Nikole Benders-Hadi).

2. High use creates an increased risk of experiencing prolonged stress & symptoms of depression but also sleep disturbances & higher causes of mood disorders (Thomée, Eklöf, Gustafsson, Nilsson & Hagberg, 2007).

3. Separation from smartphones can cause symptoms of anxiety for moderate & high users. (Cheever, Rosen, Carrier, Chavez, 2014).

"As a result, we suffer from Neomania - an addiction to anything new within the last five minutes."



Chapter 6

Designing the Series

This chapter shows the final concepts and collection of the critical design series. Each concept was made for one of the five themes defined earlier. For three of the 5 concepts, prototypes have been made.

In this Chapter

6.1 The Collection
6.2 Making of - Movies

Background Image - Devices by Erin Pollock

BlueSmile

The Social Paradox

A Bluetooth headset with neck support that has two add-ons on each side, using electrical muscle stimulation technology to stimulate the four key muscles needed for a genuine smile. By creating a contraction of the zygomaticus major and the orbicularis oculi muscles, BlueSmile is able to replicate a humans natural behavior and replicate a real smile. The product re-engages users with the people around them and creates the first step needed towards a more pro-social future.

CarePhone

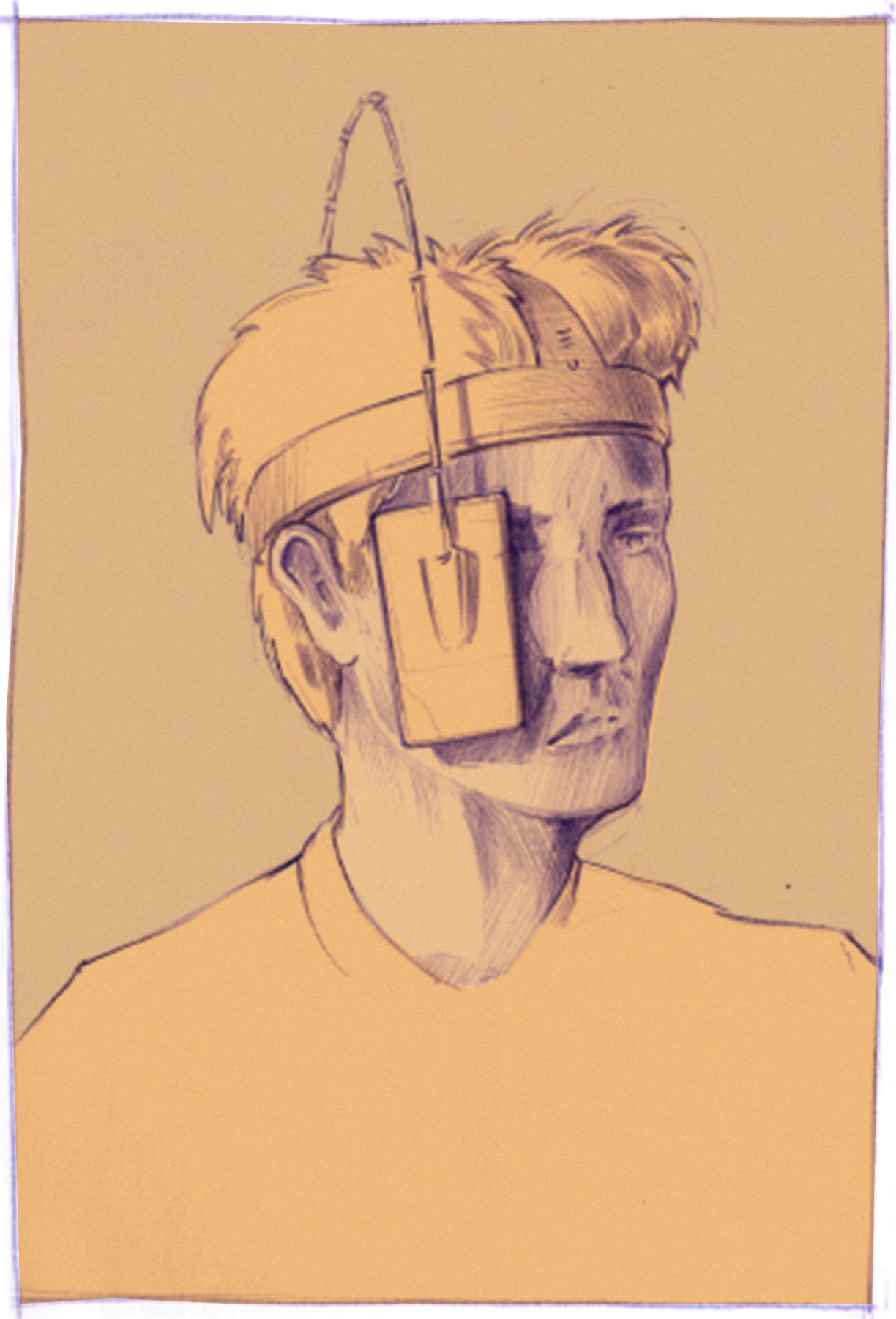
Loss of Solitude

An phone made for times of emergency. This phone looks and feels exactly like your real phone but has as sole function to make sure you are being distracted and entertained whenever your real phone is out of function or lost. The integrated memory game increases in difficulty and rewards you with the same positive reinforcements you were conditioned by through your real smartphone. Its purpose is to alleviate the feelings of distress, anxiety and restlessness you experience whenever you end up without your real phone.

WakeUp

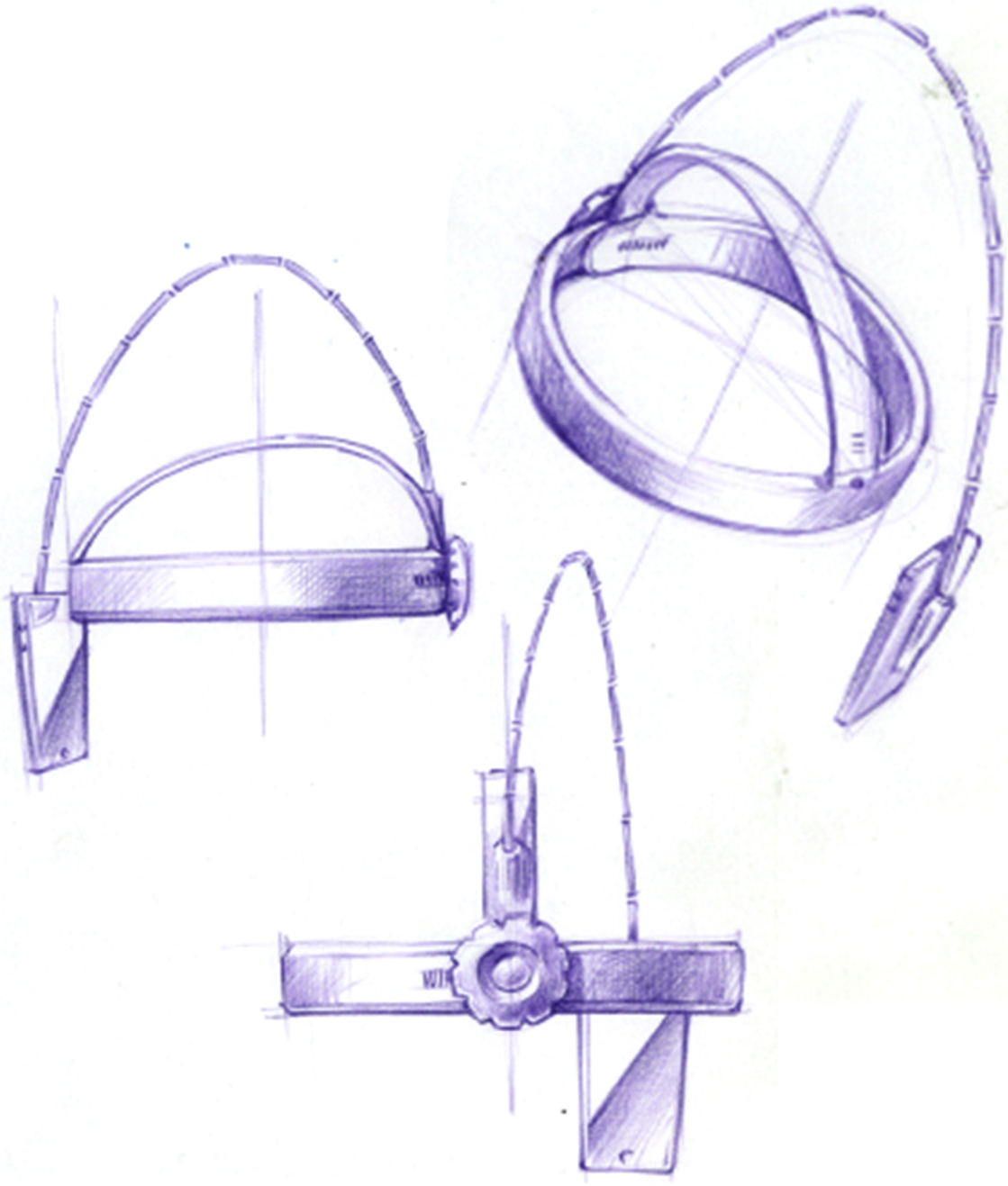
Internal Friction

The first physical product that helps you keep control over your social media time. Keeping you below the healthy limit of 30 minutes a day, this gadget is designed to wake you up in a dramatic yet rewarding and joyful way. It releases a shot of confetti from the back of your phone after you have been scrolling for 10 minutes consecutively. This product pulls you out of a very unconscious state of mind, adds a happy physical contribution to the environment and creates social pressure as peers around you become aware of your social media use..



Dividia

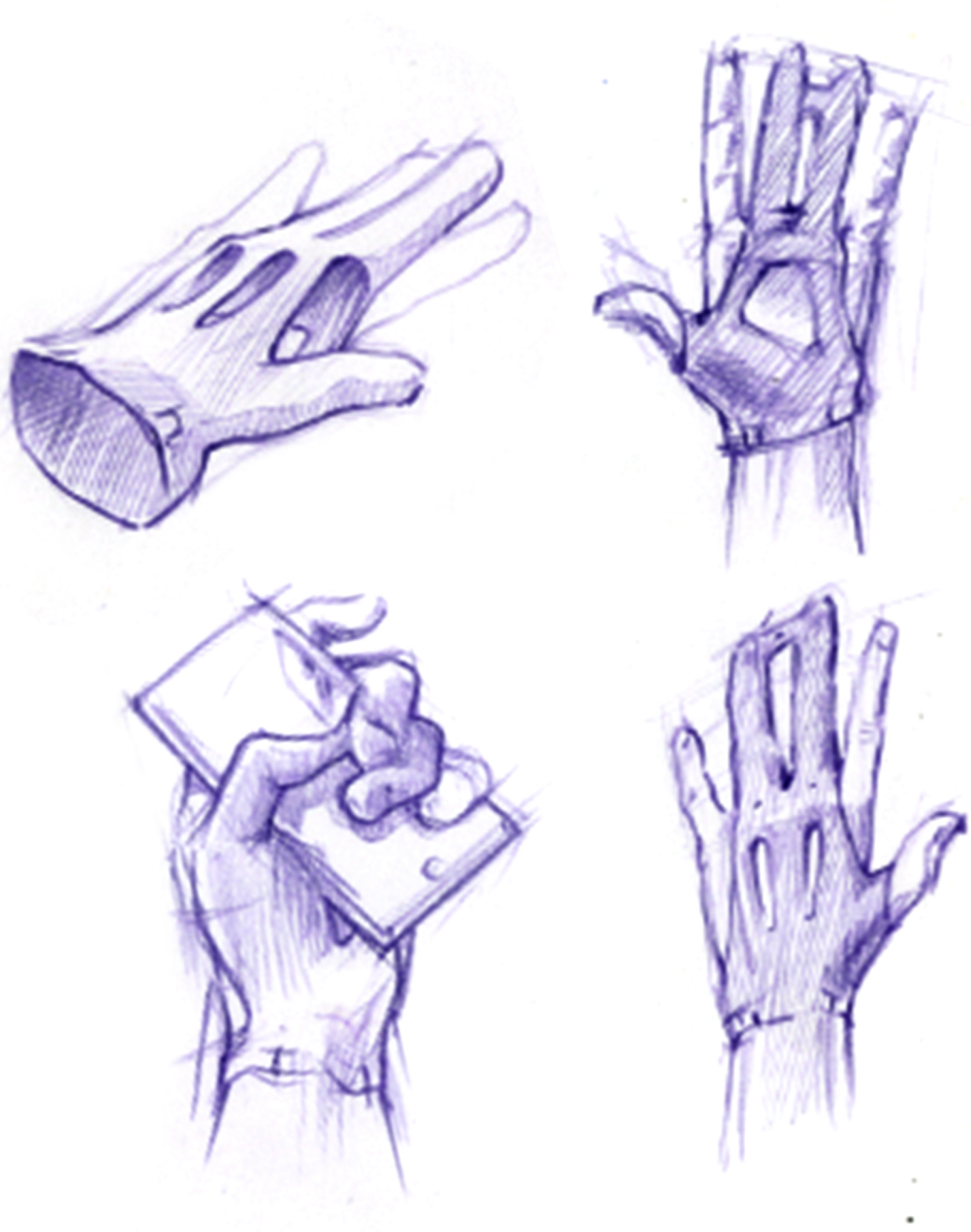
Your Divided Attention



A smartphone holder that allows you to divide your attention at all times between your direct environment and your smartphone. This product makes the switching between your point of focus faster, without the need to put away your smartphone.

iSleep

The Addiction



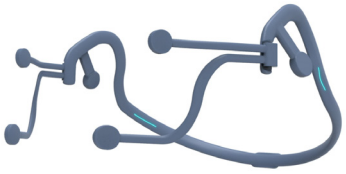
This glove allows you to sleep with your smartphone in your hand. The glove has a cushion giving the phone a grip and soft surface to lay in. The glove can be closed so that you keep it with you at all times. In the morning, unbuckle and start scrolling right away without any delay.

7.1 Making Of - The Movies

A sneak peek is given into the making of each of the videos. For each prototype, a complete script was written. For each video a team was gathered of more or less 5 to 6 people to help filming and acting. The intention was to make three different types of videos, to have some variation and be original. Each video was edited and put together by myself.

BlueSmile

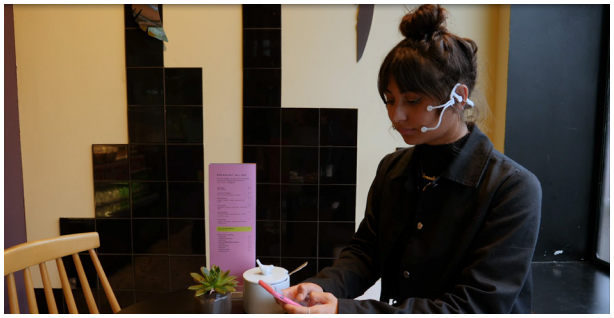
A variety of shots and scenes were used. We enacted being a company that invented BlueSmile.



Animated renders with background voice overs made the product look real and professional.

An electrical engineer with a british accent explains how the product functions.

We hired designs to work shoot very creative looking dynamic shots.



The product is shown in context and how it functions.

CarePhone

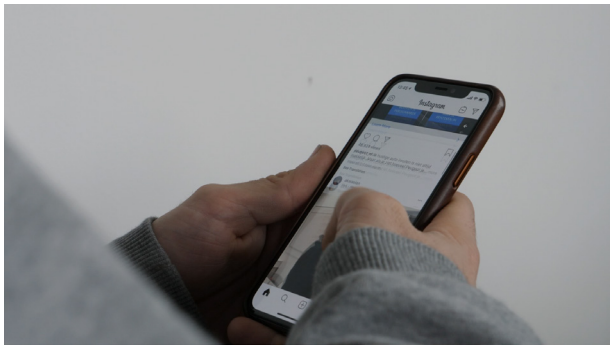
This video is much more dynamic as I walk towards the camera and talk to the viewer.

I set the tone and talk in a very direct way to the viewer to explain the problem.

I introduce the product as if it will solve all of our issues related to the problem previously mentioned.

A strong finishing sentence and good acting skills make this video believable and interesting to look at.

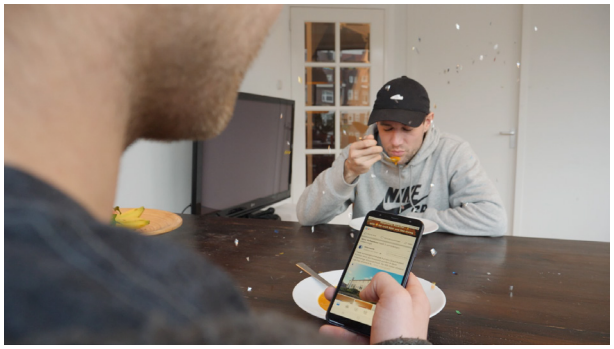
WakeUp



This video is very dramatic . I do not appear in it myself but recorded the voice over.

In this video the emphasis is put on our social needs to connect through social media.

I introduce WakeUp, the gadget that helps keeping your social media use under the healthy limit.



I exaggerate on the different scenes where the confetti shoots. At dinner, on the toilet.. etc.

Chapter 7
Evaluation Study

This chapter is dedicated to the evaluation of each of the concepts and to which degree they reached their goal. A more broad project evaluation and concluding remarks are given.

In this Chapter

7.1 Concept Evaluations
7.2 Concept Reviews
7.3 Concluding Remarks

Background Image - Smartphone Holiday by Daniel Garcia

7.1 Concept Evaluations

An important part of creating strong and provocative critical designs is building a complete narrative around each product. A very simple but great way of doing so is by making well edited, commercial like videos. This way, we can stir up emotions and create confusion within the audience, to later make them reflect and start thinking about the true issue behind these designs.

Design Goal

The design goal of this graduation project is the following:

Engage and provoke debate/reflection within the audience by creating a series of critical designs based on scientific insights, encouraging them to think critically about the repercussions of their personal and our collective relationships to smartphones.

Evaluation Study

The goal of this evaluation study is to find out whether the prototypes provoke a conversation or debate about the personal and societal relation one has towards their smartphone. For each prototype, the emphasis of the conversation should go towards the specific theme the concept tries to tackle.

7.1.1 Research Questions

Main research question:

Do the prototypes and narratives make them reflect about our behaviors and our relations to smartphones? Further Questions that will be addressed are the following.

Are the participants provoked by the videos and prototypes? Are their emotions stirred?

Are they able to relate the framed narratives to their own behaviors and to the ones in society? Are the participants able to conceptualize and understand the critical message behind the designs and narratives?

7.1.2 Outline Study

Set Up

The interviews were held in a informal environment. The participants had to sit at a table. At first the videos would be shown, without any prior explanation about the goal. At the same time the product would be laying on the side of the table. The intention is to set the context and immerse them in the narrative. The conversations would last around 30 minutes on average.

Participants

In total 8 participants took part in the evaluation talks, lasting between 30 minutes to 1h30 minutes. The age of the participants was between 22 and 30 years old.

Procedure

What we want is to create a moment of doubt within the participants, and try to make them believe the products are real solutions to real problems.

1. The video would be shown followed by the prototype.
2. I would ask what went through their minds and what they felt.
3. Elaborate on their answer and afterwards discuss the underlying problem I try to tackle.
4. Try to continue the discussion and see where it goes and for how long it lasts.

7.1.3 Results

BlueSmile

Provocation

The narrative and product together where very successful at provoking the participants as BlueSmile showed a very undesirable and creepy product but was sold in a very commercial and normal way, creating friction. It immediately stirred emotions and created reactions such as;

"It makes you think and such a product would be awful obviously, it doesn't resolve the real issue."

- Participant 2

"Technology is moving forward so fast, if this would happen, we would reach a peek and it would go too far."

- Participant 5

"It's sad as this product is trying again to use technology to make something more human."

- Participant 4

Criticalness

Participants were able to recognize the real problem and the critical viewpoint taken towards our behaviors with smartphones, even if they weren't fully aware of it; by for example saying:

"The first, more important problem is obviously the use of smartphones, and here you are pushing it to the side."

- Participant 1

Others participants did immediately understand the critical aspect and reacted differently;

"It's like a caricature of society. "

- Participant 7

"Perfect Satire, this makes me happy. To react to the problem in such a way. Really a great way of using satire and humor to comment on a societal issue."

- Participant 8

Products

In general the product was seen as a very creative out of the box way of trying to make a statement about the social paradox.

Participants enjoyed the fact that it was a very mechanical laugh, that there was nothing social about it really.

It showed an alternative reality where we wouldn't have to do anything anymore, even smiling.

"It wants to make you more social but just puts another mask over yourself."

- Participant 3

Reflectiveness on Behavior & Society

The most satisfying part of this evaluation was the discussions that were held after having shown the videos and prototypes. It really struck me how every participants immediately had their opinions and wanted to share their perspectives on our behaviors in society.

"People are so much on their smartphones they become disconnected from their own emotions."

- Participant 1

Discussions were held about how smartphones are changing the way we learn to communicate, especially for the younger generations and how it can affect their social skills, to read emotions, build empathy. Discussions were also held about evolutionary psychology and how social media tended to trigger evolutionary cues. Some discussions lasted for more than 30 minutes.

CarePhone

Provocation

The Care Phone did a good job at provoking the participants, as they were able to relate to their own behavior much more. They were able to see the ridiculousness in how they might behave themselves.

"99% of the time this is exactly what we are doing!"

- Participant 8

"This is a good way of spotting the problem, to rub it in."

- Participant 5

"It's like you are solving this new need of never having to be bored or daydream anymore.."

- Participant 3

Criticalness

The critical message was obvious for most of the participants. The narrative made it very strong, but the fact that the Care Phone was really made and developed to such a far extent made a statement.

"Oh my god! This is exactly what we are doing the whole time. Trying to fight problems technology is bringing with technology."

- Participant 5

"This really makes me think. When I hold and use it even more. I could actually really play with this thing for a long time.. And that says enough."

- Participant 3

Products

The product reached a very high level of development and was able to impress and create much curiosity within the participants. Everyone reacted astonished when I showed the specifically made PCB board and all the components soldered on it, all for this critical design.

Reflectiveness on Behavior & Society

The Care Phone was able to trigger a much more personal reflectiveness within the participants compared to BlueSmile, this is logical as the behavior of just distracting yourself feels much closer and easier to reflect on than smiling less or being less social. The design ignited discussions about how the future would look like;

"Especially for the younger generations it can be bad, there is this whole new way of passively consuming games and entertainment through screens. It's like your imagination and fantasy is already given to you, and kids are not doing it themselves anymore."

- Participant 2

"I also started looking for different phone, I realized how I addicted I was and how automatic my behavior became. It really makes me think of cigarettes."

- Participant 3

Results WakeUp

Provocation

WakeUp was successful at provoking the participants as the narrative was much more focused on showing the use of social media in the context. The confetti made it ridicule, critical but in the end very visible, that we are using social media almost everywhere we are..

"This one is a bit more funny, we are really using social media everywhere, even while having dinner with others."

- Participant 6

"You really pushed it with this one, here you really are looking to rub it in, as this confetti makes it look so stupid in a way. "

- Participant 1

Criticalness

In this case the critical message was more obvious, due to the more dramatic video made and the function of the product. This worked differently as with the other two products, as it was much more clear that our behaviors are ridiculed.

"I think people would quickly stop using social media if this would really become a thing."

- Participant 8

"The humor in this one is very obvious, I think the story behind where this design comes from is important, otherwise it just seems like a joke."

- Participant 3

Products

This concept was experienced differently than the other two, as it tries to solve a problem in a way. The other two worked against the problem by eventually making it worse. In this case, the product itself was a non-working prototype and needed the video to make the statement. This created some variation.

"If the product would have been made fully workable, I would have maybe bought it myself, or for a friend as a joke."

- Participant 3

Reflectiveness on Behavior & Society

With WakeUp the goal was to really let people reflect on our behaviors towards social media. This was achieved but unfortunately not with the serious

undertone that I wanted. This was due to the fact that the narrative was much more funny, and created less friction within participants minds.

"We do use social media everywhere, it's a shame to be honest."

- Participant 3

"Man, I think you could have exaggerated much more with this one, and emphasize much more on how sad it actually is that we use social media when being with others.."

- Participant 5

7.2 Concept Reviews

The evaluation of the concepts has shown that the goal to provoke a discussion and debate about our relation to technology and smartphones was successful. The prototypes and narratives were great catalysts for participants to experience and imagine a different plausible present or future, igniting the reflective questions within them which we wanted to ignite. Of course, many iteration and ameliorations can still be made for each of the prototypes.

The Bluetooth headset with add-ons was in most of the cases received as very thought provoking and reminded a lot of participants of the Netflix Series Black Mirror. In that sense, the effect wanted was definitely reached, although it felt less original to myself the more people told me it reminded them of Black Mirror. At the same time, this could be seen as a compliment, as this series was very successful.

Without further explanation of what the effects of smartphones were causing on a social level, this critical design was especially successful at critiquing our behaviors on a societal level, and less on a personal one. This of course was due to the fact that it's very difficult to be reflective and aware of your own social and smiling behavior.

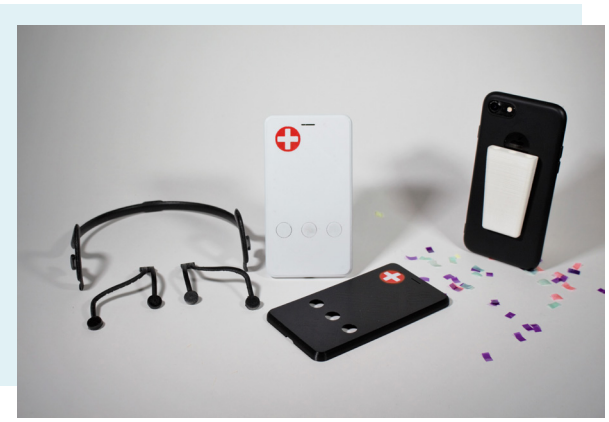
Recommendations

It would have been interesting to really make this product work, in order to reinforce the statement even more and see how people would react.

The CarePhone overall got very positive responses and was better at provoking and creating critical thought towards ones personal behavior than towards the bigger societal issue. Through experiencing the phone and the game with the vibrations and sounds, participants were very much remembered of their own behavior. The overall finishing of the product and effort put in it emphasized the statement that I wanted to make. In general the CarePhone got the best reactions compared to the other two products.

Recommendations

In the final prototype, one element that was missing was stimulating the "swiping" and "scrolling". It would have been interesting to also trigger these very conditioned behaviors within the audience and participants.



The WakeUp gadget was generally seen as a funny product, as it ridicules and makes visible how we behave with social media nowadays. To my own disappointment, I would have wanted it to create a more frictional feeling or experience within the audience, to emphasize more on how sad it is that we cannot keep our hands from our devices even in moments we should put our attention and focus to the things in our direct environment. In addition, this product could have been developed and finished further.

Recommendations

Further development of the product would have been a strong emphasizer to make a more critical statement. It would have also been interesting to create a better developed narrative, emphasizing more on the sadness of our behaviors towards social media.

In general, the collection received very positive and interesting feedback. Combined, the three prototypes gave a complete feeling. Having a collection gives an opportunity for the audience to choose or have preference towards on of the three. It is logical that some designs have a stronger impact than others, this also depends on the type of person.

Eventually the goal of this thesis was to create a discussion about the effects of smartphones on ourselves and society, and thanks to this collection this was definitely achieved.

Recommendations

It would be very interesting to investigate different ideas and critical designs related to smartphones, as the possibilities are endless. Additionally it would also be interesting to create a “How-to” for critical design, as this does not exist yet.

7.3 Concluding Remarks

This part concludes and summarizes this project and proposes final recommendations for further research.

To begin, a lot of knowledge was gained regarding the effects and developments of smartphones, which in contrary to what you would expect, opened my mindset and allowed to take a more neutral viewpoint towards the matter. Taking a more neutral standpoint and being aware of the fact that there are always positives and negatives to everything, made my arguments stronger and more convincing.

It was a true pleasure to be able to go through a discovery regarding critical design practice and how to implement scientific evidence into a more artistic design approach that we are normally used to.
Being able to implement my own perceptions and opinions regarding society into a design project was truly beautiful, as it gave meaning to my work and kept my motivations high to deliver something.

Specifically because critical design is about making a statement about assumptions and values in society, it shifts the focus from the designer and the object to the concept and statement, giving much more fertile ground for discussion and debate.

Limitations and Implications

There are obviously limitation and implications that need to be taken into account. As there is no real “How-To” for critical design, there is not a lot of material to compare this work with. This makes it difficult to assess the true quality of the work, or how it could have been done differently. Especially because critical design theory is applied sporadically using concepts as inspiration rather than constructing a complete and consistent argument, it creates a sort of unknown work space in which to act. It would have been interesting to research different methods and processes to apply within critical design practice.
On top of that, it would have been interesting to share the narratives and products with a larger audience, to exhibit the work in a museum or participate at the Dutch Design Week, to see how far the critical messages and designs could reach.

For Future Research

Research into Critical Design

During this project there was little literature found on critical design, it would be interesting to do the research personally, regarding methodology, practice and how to continuously test and adjust critical design ideas to make them stronger and give them more impact.

For Future Design

Discover new Ideas and contexts

It would be very interesting to create critical designs that are more specific to a set context, instead of taking a zoomed out and broad approach like was done in this thesis.

Critical Design for commercial purposes

It would be interesting to see if critical designs could be created in a way that they become interesting for commercial purposes as well. Typically this would be against one of the base principles of critical design, but I believe it would still be an interesting area for further research.

Reflection

As a final note, reflections on the course of this project are shared and personal developments are discussed.

Personal Development

Throughout this project I have come to first of all find and truly appreciate my own perceptions and beliefs regarding design and how design can have a much deeper and stronger impact if we compare it to affirmative, or consumer based design. It feels good to take a critical stance towards society and question our affirmations and values, without just accepting what ever seems to be "normal" in society. It really nurtures my feelings of confidence and self-awareness, and makes me proud to be able to see and not take part in mainstream movements or ideas society may impose on you.

I have come to realize that creating and building a whole project based on my personal opinions and ways I perceive the world can inspire a lot of people around me, it seemed as there was a touch of authenticity and real motivation that sparked peoples interest. Of course, the chosen topic is very relevant but the perseverance and true interest in it seemed to transcend into the work and stories I delivered.

In addition, I believe critical design really allows to shift the focus from the designer and the work towards the concept and statement that is shared. Which in turn gives meaning to the designer, as he puts his critical views above himself, leaving behind selfish or egoistic motivations.

Project Reflection

I have to honestly admit that during the whole process of this project I have enjoyed myself and the work that I was able to deliver. As to say that many students experience stress and worry during their project, I have deliberately and consciously made the choice from the beginning to enjoy this process and try to keep it as close to myself as I could. This resulted in a final result that I can be very proud of and that I enjoy looking back at. Not to say I could have never imagined that the final results would have become what they are now, but I am confident to say that if you choose to keep a project close to your own needs, values and beliefs without putting other people's expectations up front, truly inspiring, authentic and beautiful things can flourish from them.

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Appendix

In this Chapter you may find the movie scripts used to shoot the videos. Other appendix material such as previous prototypes, arduino coding, images, research summaries, CAD models and all the other material is available to any reader who wishes to consult it, please contact me if necessary.

A. Movie Scripts

Background Image by Pawel Kuczynski

A. Movie Scripts

Script BlueSmile

Script_BlueSmile;
FADE IN:
B-ROLL CROWDED AREAS, PEOPLE ON SMARTPHONES, UNAWARE OF SURROUNDING.

VOICE OVER;

Research shows we are smiling 30% less, losing our social skills and de-socializing as a society.
SLOWMOTION SHOT OF LONELY PEOPLE ON SMARTPHONES (3 DIFFERENT PEOPLE);

VOICE OVER;

Affecting millions of people a year, loneliness, social anxiety and depression are on the rise!
The reason? Smartphone addiction. Now is the time to act and find a solution for this alarming situation.
ANIMATED RENDER OF BLUESMILE PRODUCT // 360 DEGREES SHOT OF PERSON USING IT SMILING WEIRDLY (+ AFTER EFFECTS ON AREAS WHERE IT TOUCHES SKIN).

VOICE OVER;

Introducing BlueSmile, the first wireless Bluetooth audio device ever that helps stimulate the four key muscles needed to smile to strangers and re-engage with your direct environment.
CEO & CO-FOUNDER SITTING NEXT TO EACH OTHER IN FLEXROOM, WEARING HIPSTER CLOTHES, PLANTS AND WOOD IN BACKGROUND/ BRIGHT LIGHT.

MATTHIJS (CEO);

We are from the Netherlands, the European country with the highest smartphone possession rate.

TIMO (CO-FOUNDER);

The main reason is the disappearance of pro-social behavior and the erosion of face-to-face communication.
CLOSE UP OF CO-FOUNDER DIFFERENT ANGLE;

TIMO (CO-FOUNDER);

So we thought; why not use technology to reverse engineer and help us with the first step towards a more pro-social future.

WIDE SHOT OF ENGINEER IN LAB TESTING AND WORKING ON DOLL. ELECTRICAL CABLES, METERS, OLD PROTOTYPES AND TOOLS IN BACKGROUND. PRINTED IMAGES OF FACES HERE YOU SEE THE MUSCLES ON WALL. WEARING HIPSTER/ENGINEER CLOTHING.
CLOSE UP SHOT OF ELECTROSTIMULATORS AND ELECTRICAL CABLES
DISSOLVE TO ENGINEER LOOKING INTO CAMERA;

PHILIP (ENGINEER);

We use electrical muscle stimulation technology to activate the four key muscles needed for a genuine smile.
CLOSE UP OF TEST PERSON SMILING WITH DEVICE ON.
CLOSE UP ON MUSCLES ON THE FACE, AREAS ARE STIPPED OUT ALREADY, USING PEN DRAWING ARROWS IN THE DIRECTIONS THE CONTRACTIONS GO.

PHILIP (ENGINEER);
By creating a contraction of both the zygomaticus major and the orbicularis oculi muscles, we were able to reproduce a real smile responsible for the fundamental approach-oriented behavior necessary to engage with the people around you.
CLOSE UP OF ENGINEER LOOKING INTO CAMERA SITTING IN LAB.
PHILIPPE (ENGINEER);
It is this that allows BlueSmile to replicate a human's natural behavior and turn a very boring, neutral facial expression, into a lively and inviting one.

SHOT OF ANIMATED RENDER FOCUSING ON ANGLE SENSOR IN THE BACK.
VOICE OVER;
The angle sensor is the so-called brain of the device.
SHOT ZOOMIN IN ON ANGLE SENSOR AFTER EFFECTS EMITTING SIGNALS AROUND SENSOR, THEN GOING FROM SENSOR TO FOUR STIMULTORS IN PULSING MANNER.
VOICE OVER;
The sensor is able to recognize when a person looks up from his or her smartphones and will send a signal to the four stimulators.
SHOTS OF NICE RENDERS;
BlueSmile is unique in a variety of ways; It not only controls its own EMS signaling process but also knows when another person is approaching you.
WIDE SHOT OF CEO AND CO-FOUNDER, BEGINNING SENTENCE THEN SWAPPING TO CEO SITTING ON TABLE LOOKING AT DRAWINGS WITH CO-FOUNDER AND WOMAN;
MATTHIJS (CEO);
We intensively worked with our designers to develop a very refined, modern and easy to use product.
SHOT OF DESIGNER WORKING ON CAD MODEL.
DISSOLVE TO;
SHOT OF PERSON SITTING IN CAFÉ USING PHONE AND NECKSUPPORT AND THEN PUT THE ADD-ONS.
VOICE OVER;
Bluesmile will easily become an inseparable part of your everyday life! It's easy to use and store.
SHOT OF PERSON STEPPING IN TRAIN, SITTING IN IT AND SMILING WEIRDLY.
VOICE OVER;
And you can take it anywhere you go.
ANIMATED RENDERS CHANGING COLORS.
VOICE OVER;
BlueSmile comes in a variety of different colors.
TOP SHOT FROM ABOVE OF PERSON OPENING APP;
VOICE OVER;
The BlueSmile app for IOS and Android continuously synchronizes with the device, showing the number of smiles on a daily basis.
TOP SHOT FROM ABOVE SEEING APP FUNCTION. PERCENTAGES RISING.
VOICE OVER;
The integrated microphones keep track of your conversion ratio, whenever you turn a smile into a real conversation.
FINAL SHOT OF RENDER WITH INTERNET SITE APPEARING.
You can visit the BlueSmile website for more information.

SLOGAN APPEARING IN SHOT;

VOICE OVER;

- BlueSmile – Reconnect with your environment.

Script CarePhone

SHOT OF PERSON ACTING OUT THAT HE LOST PHONE, LOOKING INTO BAG, JACKET, POCKETS.. BEING PANICED..

CEO WALKING INTO FRAME WITH THE LOST PHONE, TALKING INTO CAMERA SLOWLY WALKING TOWARDS CAMERA.

VOICE OVER

Are you also experiencing anxieties and increases in heart rate and blood pressure whenever you are separated from your phone?

Are you also scared of that moment you end up without it and have to be bored or look out of a window?

PEOPLE SITTING IN CORRIDOR, ALL ENTERTAINED BY PHONE. I WALK PASSED THEM.

VOICE OVER

In a time where entertainment, information and constant connectivity is put at our fingertips;

TALKING INTO CAMERA FIRST VERY SLOW, HOLDING PHONE AND BOOK IN BOTH HANDS, THEN THROWING BOOK AWAY.

CEO TALKING INTO CAMERA

Just letting your mind wander, reading a book or being bored is a thing from the past.

ACT OF PEOPLE BEING REALLY HAPPY WITH PHONE, LAUGHING HOLDING IT TO HEART, SITTING TOGETHER BUT BEING FOCUSED ON PHONES, NOT EACH OTHER, IN A CORNER OF ROOM, ONE SITTING, OTHER STANDING.

VOICE OVER (CEO)

Our phones have become the closest companions we could have imagined.

VOICE OVER (CEO)

WALKING PAST ALL THE DISTRACTED PEOPLE, TALKING INTO CAMERA AGAIN WALKING TOWARDS GUY WHO IS STANDING, HAPPY ON PHONE. STOP WALKING WHEN STANDING NEXT TO STANDING PERSON, TAKE HIS PHONE OUT OF HIS HANDS.

CEO (MATTHIJS)

And the constant stimulation keeps us busy, but makes us extremely vulnerable in times we are not.

POINTS DOWN WITH FINGER LOOKING SERIOUS.

CEO (MATTHIJS)

This is an emerging health problem.

DISSOLVE TO BLACK_ COME BACK TO WHITE

VOICE OVER

TAKING CARE OUT OF POCKET, HOLDING NORMAL AND CARE PHONE NEXT TO EACH OTHER, LETTING NORMAL PHONE FALL DOWN AT END OF SENTENCE.

VOICE OVER

This is why you need CARE, the first emergency phone that keeps you calm and entertained, whenever your normal phone is dead or lost.

CLOSE-UP SLOW-MOTION SHOTS OF CARE PHONE. Maybe Render?

VOICE OVER

The Care Phone looks and feels exactly like your normal one and has an integrated

memory game keeping you distracted from whatever you should be thinking about.
SHOT OF ME GIVING CARE PHONE TO GUY WHO IS ANXIOUS NEXT TO ME, CALMING DOWN AND STARTING TO PLAY AND BE DISTRACTED/INTO IT.
It uses the same psychological principles and triggering techniques your regular phone does, rewarding you with the positive reinforcements you need, in moments of anxiety and solitude.
SHOT SOMEONE USING CARE PHONE, Close-ups. DIFFERENT ANGLES, B-Roll SHOTS, focus on light,

VOICE OVER

The combination of lights, sounds, and vibrations will trick your brain and keep you focused on the emergency phone as the game evolves.
BACK TO SHOT OF ME SITTING NEXT TO OTHER PERSON, PERSON BEING REALLY FOCUSED ON CARE-PHONE. ACTED SCENE OF PERSON USING CARE PHONE FROM ABOVE

VOICE OVER

This Phone makes sure you stay focused and keep paying attention so that you will never be bored or start daydreaming.
EXAGERATED EMERGENCY AND EXTREME SHOT OF ME HOLDING CARE PHONE TOWARDS CAMERA, ADD AFTER EFFECTS.

VOICE OVER

With its 90 days long battery life, strong and shock resistant design, this phone will always be at your side and ready for an emergency.
RENDER AND ME TALKING INTO CAMERA.
Care, the first phone to help you in a threatening situation. Built with well-being and love in mind.

Script WakeUp

Wake_Up_Script
FADE IN;
B-ROLL OF SOCIAL MEDIA STREAM ON SMARTPHONES ON WHITE BACKGROUND. NICE HAND SCROLLING DOWN INSTRAGRAM.

VOICE OVER

Yes, Social media is addictive, and its sometimes difficult to keep control over your screen time. But why is that exactly?
DRAMATIC SHOT OF A PERSON BEING SUCKED INTO THE APP. BEING VERY UNAWARE OF SURROUNDING.

VOICE OVER

Social networks are an extension of ourselves and our offline worlds.
B-ROLL OF SOCIAL GATHERING WITH PEOPLE ON THEIR SMARTPHONES.

VOICE OVER

It’s a social instinct driving our need to connect and interact with others that triggers us and makes us comeback for more.
SHOT OF PEOPLE TALKING TO EACH OTHER IN SLOWMOTION, SHOT OF PERSON THINKING LOOKING WORRIED BEHIND PHONE, AND THEN SHOT OF STEVE JOBS OR SOME TECH CELEBRITY. (MARK ZUCKERBERG).

VOICE OVER

Our need for social validation, social comparison & our fear of missing out are all triggered by social networks, and the engineers behind the apps deliberately designed them this way.

SHOT OF SOMEONE READING BOOK AND USING SOCIAL MEDIA AT THE SAME TIME.

VOICE OVER

Now, keeping control over your social media use can be difficult, we know how you feel…

DRAMATIC SHOTS OF PEOPLE TIRED PERSON GRAYED OUT SHOT. SHOTS OF PEOPLE IN THE STREET ON PHONE.

CEO(Matthijs)

Luckily, we found a solution and created the first ever physical product that solves this problem.

SHOT OF PERSON HOLDING THE PRODUCT INFRONT OF CAMERA, THEN PUTTING IT ON THE BACK OF THE SCREEN. ADD LITTLE CLOCK IN SCREEN.

VOICE OVER

WakeUp is a gadget that keeps track of your social media screen time. This smart device has been programmed to keep you under the healthy limit of 30 minutes a day.

VOICE OVER

SHOTS OF PEOPLE USING THE PRODUCT IN FUNNY SITUATIONS. ONE IS SITTING ON A BENCH IN A PARK, ONE AT THE STATION, ONE WHILE HAVING DINNER, ONE AT A CONCERT. AND THEN THE FINAL IN A BUS WITH MORE PEOPLE, ONE AFTER THE OTHER.

VOICE OVER

After ten minutes the device will do something incredible. Yes, it wakes you up with a shot of confetti.

One, we are waking you up from a very unconscious state of mind.

Two, we are adding a happy physical contribution to the environment.

And three, we are creating social pressure as peers become aware of your social media use.

SHOT OF VERY HAPPY PERSON WAKING UP FROM SOCIAL MEDIA.

VOICE OVER

Ultimately, with WakeUp we train you to keep your social media use at a healthy limit.

DISSOLVE TO WHITE;

FINISH WITH NICE RENDER OR SHOT. SLOGAN COMING IN.

WakeUp, bringing you back to the real world.

Master Thesis
Design for Interaction
by Matthijs de Koning