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ÚSTAV JAZYKŮ

THREATS AND NEGATIVE INFLUENCE OF THE USE OF TECHNOLOGIES

HROZBY A NEGATIVNÍ VLIVY POUŽÍVÁNÍ TECHNOLOGIÍ

BACHELOR'S THESIS

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o Závislost na pornografii

o Závislost na hraní počítačových her

o Vliv na dospívající chlapce ve srovnání s dívkami

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ABSTRAKT

Uživatelsky orientované produkty technologického pokroku jsou všudypřítomné a mají nepopiratelný vliv na člověka i na společnost. Cílem této semestrální práce je shrnout negativní důsledky používání těchto technologií a poukázat na možné hrozby se zaměřením na kognitivní funkce lidského mozku, behaviorální závislosti, které tyto technologie přinesly a uzavřít práci nabídnutím možných řešení dílčích problémů a návrhem výzkumných metod, kterými by se dal průzkum na dané téma rozšířit.

KLÍČOVÁ SLOVA

kognitivní procesy, kognitivní odlehčování, Snapchat, smartphone, nadužívání, behaviorální závislost, pornografie, videohry, sociální média

ABSTRACT

The consumer-oriented products of the technological development are omnipresent, and their presence has had an undoubtable influence on the individual and society. The aim of this semester thesis is to summarize the negative effects of the use of these technologies and point out possible threats, specifically focusing on the cognitive functions of human brain, behavioral addictions brought by the use of the technologies and conclude with possible solutions of partial problems and research methods to elaborate further investigation.

KEY WORDS

cognitive processes, cognitive offloading, Snapchat, smartphone, excessive use, behavioral addiction, pornography, video-gaming, social media

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PROHLÁŠENÍ

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V Brně dne

.....

(podpis autora)

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1. INTRODUCTION AND DEFINITIONS

1.1. Definitions

So as to make clear what is meant by certain key words used in the thesis it is vital to define their meaning. Of the key words used in the thesis the most important ones are those composing its name.

The word “technologies” may include a vast variety of terms. From the invention of the fire to the complex systems of the nuclear power plant. The aim of this thesis is not to cover every possible influence of every existing technology. The term *technology* or *technologies* in this thesis will mark rather narrow range of personal devices like personal computers, smartphones and smart portable devices like tablets etc.

The term “*the use*” in the thesis stands for an average use in a given context (e.g. if I am writing about the use of smartphones in Czech Republic “the use” means the average amount of time spent using the device in Czech Republic). The point of defining the amount of the use explicitly as average is that usually what has a negative effect is the “overuse” or excessive use, not an average use. However, as it’s going to be mentioned, the present amount of the use of the technologies is still above what is recommended (by medics, for example) as healthy amount and so even the average use may be considered an overuse. Nevertheless, for the purposes of the thesis the term “use” is going to describe an average use (even if higher than recommended) and the excessive use is simply going to be described as “the excessive use”.

I don’t find it necessary to define the terms “threats” and “negative influence”.

1.2. Introduction

Technology is omnipresent. It penetrated life of most of the people of the developed world. Over three billion of people out of the seven that make up the entire population of earth own a smartphone today (1). Such a technology that took over almost half of the planet’s population is of a historical scale and has impact on humankind’s evolution, society, human as an individual, its health, even sexuality or security. All these areas are influenced by technology

today.

Though technologies are being presented as attractive and harmless there is a dozen of researches proving about their negative effects – may it be the addictiveness of social media, misuse of personal data or harmful somatic effects.

Though there might be many contributive, great and priceless effects of the invention of the technologies, this thesis is only going to focus on the negative effects (as is clear from the name of the thesis). This is because of the personal intentions of me as the author to alert about these possible negative influences.

For years I've been observing an addictive behavior of the users of the novel technologies. Not only on people around me but also at me myself. The more I would study the topic and think about it the more I would become sensitive to how many people around me spend unhealthy amount of time on their devices and much more. I would become sensitive to the influence on the communication and relationships and to the way the novel technologies influenced the flow of information. Because of how massive the influence is it is in my opinion crucial to study the possible negative effects.

The thesis views the possible negative effects of novel technologies from the point of view of three arts – physiology, psychology and sociology. Though the key and main part of the thesis is contained in the Chapter 3 – The Negative Influence of the Use of Technologies on Human Psychology – the other two chapters – influence on physiology and society – are added because they were considered as an important completion of the view on the problematics.

The aim of this thesis is also to bring an alerting message about the technology's negative effects on the academic soil of the technical university, under which's supervision the thesis is written, to contribute to objective and holistic perception of the technologies.

Part of the thesis is also experimental research conducted in the local context.

2. THE NEGATIVE INFLUENCE OF THE USE OF TECHNOLOGIES ON HUMAN PHYSIOLOGY

Former semestral thesis was focused mainly on psychologic health. This short chapter expands the work by only mentioning some of the main influences of the use of novel technologies of human physiology.

2.1. Orthopedic issues on arm, hand, wrist, and fingers

Average smartphone user spends three to four hours daily on his phone. Most of the interaction with the phone consists of very miniature and repetitive movements of mainly fingers and hand (e.g. typing on a keyboard, both on laptop and smartphone devices). Excessive and long-term exposal to such movements may result in inflammation and other injuries described in the chapters bellow. The arm may also be exposed to an undesired condition if held in a stressed position for a long period of time, which, unfortunately, is usually the case of the use of technologies.

2.1.1. Tendons inflammation (tendinitis)

Inflammation in its basis is a reaction of the organism to a malfunction in the body (2). During inflammation immune system cells release hormones that widen the blood vessels so more blood can reach the affected place in the body and fix it. This process is usually accompanied by pain, heat or red color of the surrounding area (2).

Extensive use of mobile devices, laptops or PC accessories may result in developing an inflammation of the tendons, most usually thumb tendons in the area of wrist, fingers tendons or tendons around the elbow. If overloaded with a constant tension or with small repetitive movements, the tissue of the tendon develops microtears which, in effect, cause the inflammation and the pain (3).

Healing of the tendinitis is best to be done by resting the affected body part (3). The worse pain may leave within days, however, healing these microtears completely would take approximately 3-6 months (3). That is an issue. Many injuries of such kind may develop because of sedentary jobs consisting of working solely with computers and techs. If the activity harming the tendons is simultaneously the affected person's livelihood, it may be very hard to find a way to rest the affected body parts sufficiently.

A way to prevent tendinitis is using ergonomically adjusted computer accessories, such as hand rests or ergonomically designed keyboards. That can provide at least partial rest of the otherwise tensed hands and arms.

2.1.2. Trigger finger (stenosing tenosynovitis)

Trigger finger is a defect of the tendon sheath which surrounds a finger muscle. The sheath gets swollen and blocks the muscle from sliding through the sheath freely. This is usually visible after clenching and then releasing all the fingers on the hand. The afflicted finger stays bent, the person cannot narrow it and has to wait until the sheath rests and finger relieves (4).

2.1.3. Smartphone pinkie

Last of the possible harms on hand is so called “smartphone pinkie”. Many users use their little finger to balance the phone while controlling it with thumb. This long-term stress on the little finger is, however, very unnatural and may resolve in pains and inflammation as well (4).

2.2. Posture, spine and consequences

(Some of the parts of the following section will not be cited for the text is based on personal interview with a physiotherapist).

Long term sedentary jobs may have a negative influence on the posture. It is important to be aware of what is the right posture and avoid bad posture habits.

While at the computer, the first thing that usually changes is the posture of lower back. Due to trunk muscles getting weaker, if not regularly exercised, the lower back relents and bends out. The lumbar spine ligaments get overstressed and may result in lower back pain,

or contribute to developing spinal disc herniation in advanced age (5).

With the spine slouched, the neck spine (cervical vertebrae) also bends and the head slides forward off the body. This causes neck pain and headaches, (6) but also influences other body parts. With the head bent forward, the shoulders naturally close in towards the chest resulting in both stiffing of the trapezius muscle and shortening of the pectoralis muscles – both major and minor. Shortening of these muscles and overall slouching of the front upper body results in lowering of the lungs capacity. Consequently, also the blood gets less oxidized which has influence basically on functionality of the whole body, primarily brain and heart.

2.3. Possible solutions

There are ways of preventing experiencing such issues mentioned above. The greatest prevention is a regular exercise. Another way to prevent somatic issues is to use ergonomic accessories.

To prevent hand from tendonitis various designs of ergonomic hand rests exist – both to be applied for keyboard and mouse. To prevent the neck from bending forward, there are laptop stands that keep the display in such a height that the user has his neck spine in desired position – slightly bent back.

Similarly, for work with phones there are cases that allow the fingers to rest and not be in constant stress. Besides that, it is recommended to use sliding function on the phone keyboard instead of typing regularly or, if possible, to lay the phone down on a desk and type both hands as on a regular keyboard (4).

3. THE NEGATIVE INFLUENCE OF THE USE OF TECHNOLOGIES ON HUMAN PSYCHOLOGY

The human brain, and human itself, has been evolving for more over than 200 000 years until now (7). Though there were eras of technological progress happening in the history, there was never something as fast and as much on a global scale like the development of personal

computers and mobile devices (e.g. smartphones, laptops etc.) (8).

Ever since the first introduction of the Apple iPhone in the 2007, the development and the use of personal devices started growing in an unthinkable pace having an inevitable influence on the minds of its users.

The following chapters will focus on the negative influence on cognitive functions and on some of the areas of the technologies use that may result in addiction.

3.1. Negative influence on cognition

Cognitive processes are all of the brain's processes people use to observe, learn about and interact with the world that surrounds them. Perceiving any kind of information, may it be visual, auditory or physical, transforming it to a meaning, making a decision based on this meaning and storing it in the memory is a matter of cognitive processes (9).

According to a collection of data done by RescueTime, a software monitoring the usage of computers and mobile phones, the average time a mobile phone user spends daily looking at their phone's screen is 3,5 hours every day (10). Beside the fact that this amount of time richly exceeds the amount of screen time recommended by specialists (that being one hour (11)) question arises how does that usage affect the cognitive processes of human brain.

Each of the cognitive functions of human brain is now going to be treated separately. It is, however, important to note that this division is rather a matter of structure. All of the cognitive processes are very interconnected and can't be viewed as absolutely isolated.

3.1.1. Long-term memory

Human memory is crucial for survival. The memories encoded in long-term memory can relate to an event that happened 15 minutes ago just as it can relate to an event that happened 15 years ago. It can be subdivided to three kinds of memory (which, among psychologists, "...reflects convenience, rather than conviction" (Matlin, 2017)). These kinds are episodic memory, semantic memory and procedural memory. The episodic memory is determined to store particular events that happened in the life of an individual (like the birth of a child, moment he/she learned something important, the experience of love, etc.). Semantic memory serves to store language, words and their meanings to which brain relates while reading or listening to a

speech or spoken language in general. Procedural memory stores information about movements and skills such as riding a bike, driving a car or using a software (Matlin, 2017).

One of the ways today's most widely used technologies can influence the ability to store into the long-term memory is so called 'cognitive offloading'. Evan F. Risko and Sam J. Gilbert describe the cognitive offloading as "the use of physical action to alter the information processing requirements of a task so as to reduce cognitive demand" (12). That includes e.g. tilting a head when wanting to read a text which is slightly rotated or noting down a shopping list instead of trying to remember it (12). Risko and Gilbert describe, that deciding for such cognitive offloading happens on the basis of the metacognitive processes (processes superior to cognitive processes, thinking about thinking). When facing the decision whether as to reinforce an information stored in the long-term memory or to use a cognitive offloading, for example search that information on the internet on smartphone, it's the metacognitive level which is in operation to make the decision. The way that the cognitive offloading in the form of using the technologies may have a negative influence is that making a decision to rely on the external process (searching the web), may, in the future, threaten the internal process of more basic cognitive function like recalling the information from the memory (12). Risko and Gilbert admit that there might be benefits to learning how to operate with such an unlimited possibility of cognitive offloading but from the view of the basic cognitive processes the negative effect must not be neglected. This demonstration of using "the tech" to make things easier is very present today and might be a threat worth noticing. Gone are the times when, if someone forgot some information (like name of a movie or some historical fact) people would try to recall what was the information and compete who would remember first. The ever-present possibility to search for information online made memory an unnecessary virtue. Which is not crucial in the case of guessing games. The information stored in the brain is helpful for everyday life, for fast deciding (for example if a person memorized the bus schedule in the times he/she usually uses it he/she has got much stronger structure to decide fast without need to search for the connection online). What effect it may have if the cognitive offloading started getting in the education? Giving an exaggerated example overheard in a conversation: "Imagine a doctor during a surgery 'Googling' what are the nerves he should cut". Despite this being a rather inappropriate example it only points out how important it is to beware of the dangers of cognitive offloading and "not give up" classical memorizing.

Another such negative example of cognitive offloading may be observed with the use of photographic devices. In 2014 Linda A. Henkel, a Fairfield University professor, examined an

experiment with the intention to find out what effect making a photography has on the quality of the memory of the photographed object. Two experiments were executed in total. In the first a group of students (n=27) was taken to an art museum, equipped with a camera and instructed which objects can be photographed and which may only be observed. A day after the tour the students were asked about the details remembered about the objects shown. In result the students remembered more details about the object they were just to observe without taking a photography (13). This phenomenon is called “photo-taking impairment effect”. When choosing to take a picture instead of observing and trying to be present in the moment and enjoy the venue the memory of the given object, people or event is impaired. Contrary to that if someone uses a high quality camera to capture an object and focuses more time on how to photograph the object in the best way possible the memory is usually better.

According to a study carried out by Julia Soares and Benjamin Store it is, however, not only the cognitive offloading that plays its part with the impairment. One of today’s most broadly used social media – Snapchat – allows for a user to take and send picture that gets deleted after viewed by the receiver. The possible intention to take the photos to ‘keep them for later’, and therefore extend the episodic memory with cognitive offloading, is therefore diminished. In the study the participants were shown a series of pictures in three scenarios. In the first scenario the task was only to observe. In the second scenario the participants could take photos with Snapchat (an app which would then delete the photos automatically) and in the third scenario the participants were made to delete the pictures manually (14). Soares, based on the experiment, suggests that the photo-taking impairment effect also resides in the attention disengagement necessary for the user to operate with the application. As long as there is no way the user would rely on the memory to store the photo for later the, still, apparent memory impairment may have a strong relation to the attention disengagement. After all, another experiment led by Aaron L. Gardony examined a navigation aid device’s effect on the spatial memory. Gardony came to similar end. Gardony thought that using navigation tools is also a form of offloading which may impair the spatial memory. However, about the navigational devices he stated that “...they appear to impair spatial memory by generally dividing attention.” (15). The technology’s negative influence on the memory capacity, then, may not reside only in the ability of technology to serve for the purposes of cognitive offloading but also in its distractive character.

3.1.1. The working memory

The working memory, also called short-term memory, stores data necessary only for the time of its use which are, then, forgotten. An example could be a phone number passed verbally during a phone call. Some may quickly search for a pen and a piece of paper (once again, cognitive offloading). Some, albeit, decide to remember the phone number instead using the short-term memory to note it after the call. The short-term memory has a capacity of 7, plus or minus 2, items (16). An item, also called a *chunk* (9), is any unitary piece of information, most usually a number or a letter, but also groups of numbers or letters that are commonly known as belonging together or work like that in the context of the user. For example, name is one chunk because it is not demanded to remember each particular letter of the name, but the group of letters is known as a word standing for a name. Trying to remember name of a man with two middle names would then be a matter of remembering four chunks (first name, two middle names and a surname), independent on how long the names are. Whether the information will proceed into the long-term memory depends on multiple factors as the subsequent periodical reinforcing of the information or the emotion present during the time of the information visual or auditory perception.

The way that the technology influences the working memory is also, as in the case of the long-term memory, related to attention. David A. Sousa implies that in his book when criticizing the way, the new technology allows for students to “switch from one task to another” (17). Because of the switching, the working memory always absorbs only a little amount of the information related to the task done before moving to another task. That “causes cognitive overload, a condition where the flow of information exceeds the brain’s ability to process and store it.” (17). This may be a big threat not only to a memory function but to the way of thinking in general. Nicholas Carr, in his article, suggests that "When facts and experiences enter our long-term memory, we are able to weave them into the complex ideas that give richness to our thought." (18). If short-term memory is a “gateway” for information to enter the long-term memory, the way technology limits the short-term memory may be more than relevant.

3.1.2. Attention

Of all the cognitive functions, attention seems to have been one the most influenced by the today’s excessive use of technologies. With the approach of computers and mobile devices the aim of the manufacturers was never for a user to have a unitary focus. Rather it was a race to

offer the greatest multitasking possibilities, the fastest way to switch between tasks and activities without a delay. That may be well visible on the home page of the internet video entertainment provider – Netflix. After logging in the user is exposed to a wide range of movie titles plus an automatically playing video trailer on the latest movie released. That is an offer hard to reject. Above it all, the devices were developed in such a manner resulting in their omnipresence. That creates a great part of the problem with attention because as long as the technologies, such as desktop computers, were possible to be used only on a fixed position the attention was affected only when using the devices. Whereas the today's mobility of the devices allowed for attention to be disrupted almost continuously as the devices have become a society broad communication mean. The RescueTime statistics, earlier mentioned above, brought up that out of the 3,5 hours of use (of the smartphone devices) 70% of the time are sessions shorter than two minutes. That spotlights the character of the ubiquitous mobile phones and their influence on attention. The chapter about social media addiction mentions partially how portable devices in combination with social media created a challenge for attention hard to overcome.

On the cognitive level, attention is “a state of focus” on a particular object or activity and “its task is to let a limited amount of information into the mind to protect it from overload of stimuli.” (19). There are two sorts of attention, involuntary and voluntary. Involuntary attention has a protective character, it reacts to extraordinary visual and auditory stimuli and, as obvious of its name, isn't usually realized or can't be controlled. Examples of such involuntary attention may be a sound of honking car on the street or a sudden strike of a lightning (that being first visual and consequently auditory). On contrary voluntary attention is one willfully intended which has an explorative character, demands effort and is often linked with will.

It is the voluntary attention threatened by the use and the excessive use of technologies. In one another article Nicholas Carr worries about the internet's influence on deep reading. He describes how the earlier capability to read long books with patience and immersion seems to have been impaired with the onset of the internet. Because of the irresistible amount of possibilities and sources to gain from, Carr started observing an extraordinary change in the manner of approaching texts, which consisted in fast, shallow, quantitative reading of the most necessary information instead of slow, attentive, comprehensive reading. “Our ability to interpret text, to make the rich mental connections that form when we read deeply and without distraction, remains largely disengaged.” (20).

By all means it is vivid that the ever-present devices and their functions have a distractive

character that has a negative effect on the voluntary attention of an individual. One of the areas that this negative influence then may impact is the motivation of students in education. With the impaired ability to develop voluntary attention there might be a lower probability that an interest in a subject will arise. Correlation between excessive smartphone use and worse school performance was delivered by a study from 2017. In the results it says that “the influence factors of smartphone overuse were attention deficit, followed by academic delay behavior.” (21).

3.2. Internet addiction and technology addiction

Cognitive functions are just part of the human brain’s functioning. Dozens of hormones and thousands of connections and signals form one the most complex biological system yet known and yet not fully explored. One such hormone strongly influencing brain’s state and emotions is dopamine, a substance released in brain’s reward system with pleasure. A great disorder thrives on behavior of dopamine – addiction – and unfortunately, technologies took unexpectedly great part in creating world’s yet widest addictions.

Behavioral addictions

All the addictions stated below are of behavioral character. Until recently medics only considered substance addictions to be tenable, like heroin, alcohol, cocaine or meth addiction. However, many cases started indicating that brain may create addiction on a repetitive behavior that shows signs similar to substance addiction, signs like creating a tolerance, repeating the behavior despite its later negative effects or showing withdrawal symptoms (shaking, fidgeting, etc.) (22). The medical manuals and classifications started considering behavioral addictions as recognized and official, first of them being the gambling addiction (addiction to bidding and playing the slot machines) and in the eleventh edition of the International Classification of Diseases (ICD-11) even the video gaming disorder.

The 5th edition of the Diagnostic and Statistical Manual (DSM-V) revealed the existing awareness about addictive behavior by including gambling disorder into the catalogue and re-naming the chapter originally called “Substance-Related Disorders” (in DSM-IV) to “Substance-Related and Addictive Disorders” (23). The American Society of Addiction Medicine defined addiction in September 2019 as a “treatable, chronic medical disease involving complex interactions among brain circuits, genetics, the environment, and an

individual's life experiences. People with addiction use substances or engage in behaviors that become compulsive and often continue despite harmful consequences.” (24).

Many of the behavioral addictions are still not fully recognized which is reasoned with a lack of research in the field.

Dopamine

One of the characteristic processes linked with the addictive behavior is the release of dopamine in the reward system of the brain. Dopamine releases in a small dose whenever a goal is achieved, e.g. when someone drinks a glass of water after being thirsty. That helps brain remember that the activity was good for resolving a problem. Addictive substances such as drugs stimulate the very same centers in brain, however, with the release of the dopamine of much greater amount. That is what makes drug addicts come back to consuming the drug and even wanting more (creating a tolerance).

Brain's reaction to many activities based on the use of technologies and internet are almost the same as reaction to a drug dose – may it be social media, video-gaming, or watching pornography – only with the difference that the dopamine dose is not as big as with substantive drugs but still much higher than the healthy dose (11). And that is a very important and alarming finding. The fact, that certain activities connected with the use of technologies can induce a strong dopamine release makes the technology a great addiction candidate. Adam Alter, in his book “Irresistible”, even describes how the portable technology vendors design their devices to be addictive and to be hard to quit or used in a healthy manner. Even Steve Jobs, founder of the Apple company and inventor of the Apple iPhone, would not let his children use the Apple devices at home because of knowing how addictive they can be (11).

Is internet addiction a threat?

Some people embraced the use of technologies as such a matter of course that they might think: “I need to drink water, every day, just as I need to check my device. So, it is normal.”. How is the “addiction to water” different from internet addiction?

In this case there are several differences between addiction to drinking water and addiction to using a device. One of the main, of course is that water is a basic need for human body to function, while technology use is not. The use of the technologies (may it be excessive or average) is an additional part of people's life. If one stops drinking water it will negatively

affect his/her health, on contrary if someone stops using a device it might as well have a beneficial effect on their health.

Also, addiction as by a definition is “a complex brain disorder” itself (25). The International Classification of Disorders (ICD) defines criteria signs that individual need to show to be stated as one having an addictive disorder. Though these are related to consuming a substance I will include them in the text as long as many signs are similar to the ones appearing with behavioral addictions ¹:

- A strong desire or sense of compulsion to take the substance;
- Difficulties in controlling substance-taking behavior in terms of its onset, termination, or levels of use;
- A physiological withdrawal state when substance use has ceased or have been reduced, as evidenced by: the characteristic withdrawal syndrome for the substance; or use of the same (or closely related) substance with the intention of relieving or avoiding withdrawal symptoms;
- Evidence of tolerance, such that increased doses of the psychoactive substance are required in order to achieve effects originally produced by lower doses (clear examples of this are found in alcohol- and opiate-dependent individuals who may take daily doses sufficient to incapacitate or kill nontolerant users);
- Progressive neglect of alternative pleasures or interests because of psychoactive substance use, increased amount of time necessary to obtain or take the substance or to recover from its effects;
- Persisting with substance use despite clear evidence of overtly harmful consequences, such as harm to the liver through excessive drinking, depressive mood states consequent to periods of heavy substance use, or drug-related impairment of cognitive functioning; efforts should be made to determine that the user was actually, or could be expected to be, aware of the nature and extent of the harm.

(22)

The ICD states that it is enough if a patient shows at least three signs of these in the previous year to be diagnosed addicted.

One partial problem of addiction is (we could even say in comparison to the water

¹ For the length of the citation I do not consider the list to be a part of the official text but rather as an attachment.

addiction) that people with such addiction put the priority of satisfying their craving above other priorities in life and so addictions in general usually have effect on people losing their jobs, families and sometimes even lives.

Apart from these reasons addictions may also have side effects. Such side effects are called comorbidities and appear with both substantive drugs and internet/technology addiction. Not only that the affected person is addicted but also harmed by the comorbidity that lasts as long as the addiction. Comorbidities of internet addiction are usually mental diseases such as anxiety, depression, feelings of loneliness and isolation.

In addition, the relationship between comorbidities, and the addiction is usually bidirectional. Not only that the addiction can cause mental disease but also people with psychological pathologies may develop an addiction more easily (26). In the case of the internet addictions it is, then, crucial to state the causality between the two (what was the origin) because it may happen that a person gets treated medically from anxieties but the origin – spending too much time on-line – remains unrevealed (27).

3.2.1. Pornography

If the aim of this thesis is to point out what are the threats of the technology usage the internet pornography is definitely an area that not only must not be avoided but also would deserve a standalone thesis and research. In this chapter I will object the dark side of pornography and pornography industry. I will summarize facts from variable sources to provide a concentrated picture about the internet pornography and its influence on individual and society.

History of pornography

History of pornography is hard to track down. Some claim the first pornography to be the small prehistoric statues of fertile woman with enlarged breasts (28). But that is far away from what is known as pornography today. An outstanding historical material often linked with the history of pornography are wall paintings in the ruins of the city of Pompeii. The paintings on the walls depict a sexual intercourse between men and woman in a delicate detail. The paintings are unique for the age in which they were drawn, and despite the fact that they were usually painted to propagate local brothels these paintings may already be considered pornography.

Throughout the history there were many revolutionary moments forming the pornography

evolution. All of them link together in an interesting phenomenon that occurs in two main ways which are probably common for every media. The revolutionary moment was related to an invention of a new technology and the new technology was immediately used for a wider distribution. Some of the crucial inventions could be the invention of the printing press in 15th century or the invention of the halftone print at the end of the 19th century, which allowed for copying the photographs. One of the greatest waves in the spirit of mass-production was brought by the printed magazines beginning to appear in the 1950s with Playboy in the lead.

A “Golden Age of Porn” is the name of a period beginning in 1970 with the first cinematic movies depicting uncensored hard-core sexual practices. One of the first was “Blue movie” directed by Andy Warhol followed by one of the most famous: “Deep throat”. Though these movies were broadcasted nation-wide they were prohibited and being caught taking part in creating such a movie or just watching it could end up in facing the court (29). This “Golden Age” was quit by the arrival of VHS, cable TV and later on also with DVD technology (30).

Of course, the greatest and the latest milestone in the story of pornography was the rise of internet in 2006 (27). Thousands of online galleries and online video streaming providers (so called “tube sites”) formed since then. In 2012 Ruslan Enikeev created a map depicting the servers and interconnections on the internet – an internet map. It contains at least most of the servers from all over the world. On the picture the white area marks the part (and size) of the internet containing video pornography servers, online erotic video-chat servers, erotic picture servers and in general websites with the erotic content.

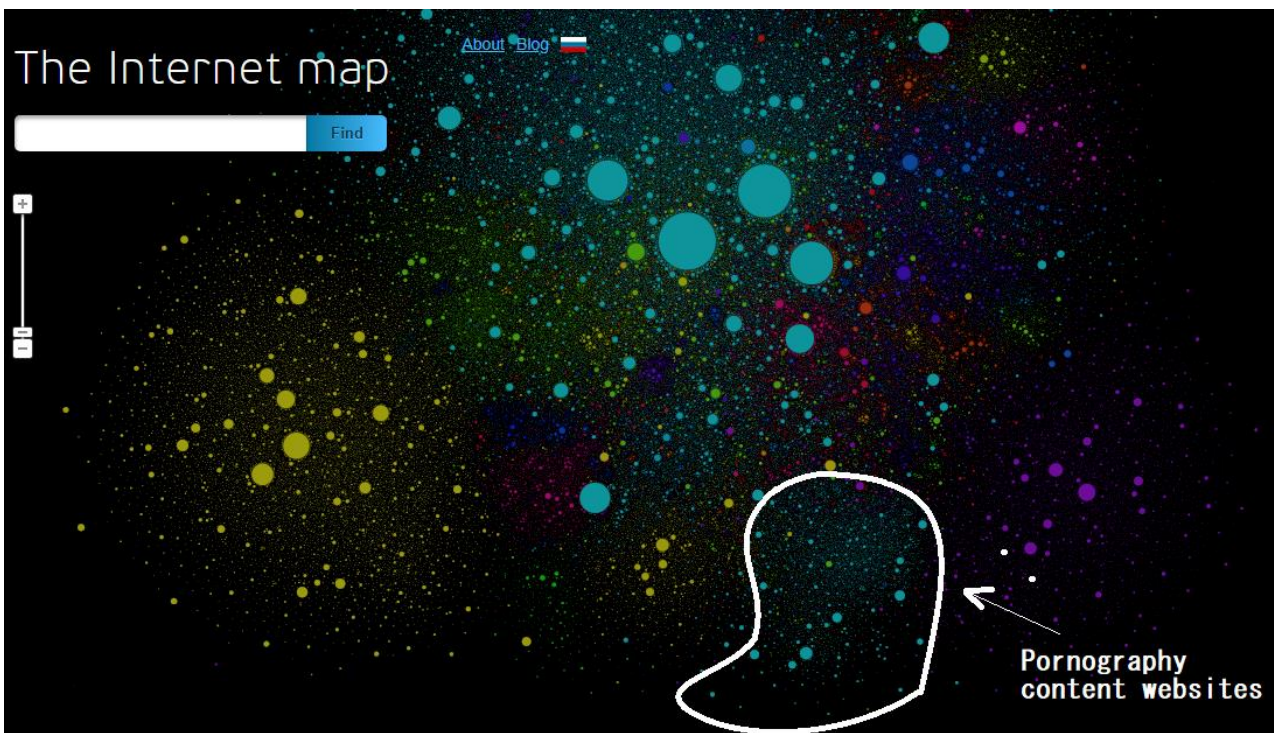


Figure 1: The Internet Map

The accessibility and consequences

With the look back at the history of pornography one of the problems of the internet pornography is the accessibility. As long as men had to go to a shop and buy a playboy magazine there was the part which demanded man to “risk” and do the unpleasant activity before they could get their pleasure. In the view of the concept of pleasure and punishment there was also the punishment (27). With the accessibility from any device connected to the internet there is nothing that an individual would have to overcome to reach for the subject of pleasure. And that has terrible consequences. The easiness with which one can get any sort of content in a manner that allows him/her to do it secretly without anyone’s discovery usually leads many to being exposed to material which they would normally even not seek or do not relate with. It is because pornography, as other behavioral / internet addictions, also works on the principle of dopamine. The tolerance, however, is not compensated with more time watching but with novelty and usually more extreme content to watch. That may be vivid from the statistics of one of the greatest online porn provider – PornHub. The second most searched kind of pornography in 2018 was “alien”, third “POV” (“Person of vision” porn that makes the viewer feel like he is the one in the video) and fourth “cosplay” (people dressed up in costumes of game or movie characters). (The first place was held by “amateurs” which may only imply how

desperately the users at the same time search for an experience closer to reality). The combination of easy accessibility and proceeding to harder and harder content then often may leave the user in feelings of deep regret and shame and might lead to isolation (27).

Other issues and comorbidities

In 2011 first online forums started to form where men started doubting the profitability of watching online pornography and started sharing about appearing issues. They started reporting anxieties, depressions, smaller appetite for real sex with women, some reported even erectile dysfunction (ED) (27). In his book “Your Brain On Porn”, Gary Wilson says that “more than 50 studies now link porn use to less sexual and relationship satisfaction. Similarly, some 40 studies link porn use to poorer cognitive function and mental health problems.”. Concerning the researches various medical and psychologic or psychiatric associations still deny admitting pornography as ultimately harmful because there is not enough research done. At the same time research is hard to do, because it is hard to achieve the causality that would proof that anxieties, depressions and isolation are the consequence to watching porn **and not otherwise**. Only eight researches figured that issue out the way that they made the respondents restrain from pornography absolutely. In all of the eight researches respondents reacted positively and the respondents mentioned the disappearance of the negative symptoms.

All of that might not be such an issue if pornography was a small industry. But given the fact it is a 97 billion US dollars a year industry (31) thriving on the decay of health of individuals and the decay of society it is disturbing with what matter of course it is being widely accepted, many times even supported.

How does the porn affect society?

Mentioning “the decay of society” it is important to note that porn industry is related to human trafficking and child abuse. Fight The New Drug movement states that according to one of the researches almost half of the women trafficked for sex abuse said they were being filmed for porn while being abused. In addition, from much of the porn online it will never be recognizable that the person is being sex trafficked. The people and groups from sex industry in general are said to be very interconnected and so people involved in human trafficking often provide people for sexual abuse used in the porn. One of the victim reported: “I was raped but had a smile on my face”. That, surprisingly, includes also the people voluntarily working in the porn industry. Why? Part of the definition of the sex trafficking states that it includes “commercial sex acts through the use of force, fraud or coercion”. Many times, it can happen

that the “actress” agrees for a scene but when it comes to filming the scene she is announced about the change of the practices in the scene, which she did not agree to. She is then threatened that not filming the scene will have consequences and so is coerced to the film making (31). The influence, however, doesn’t reach only as far as the actors and the victims. Huge impact on society dwells also in the consumers who, through regular watching of pornography, re-shape their imagination of approach to sex and as from the videos may start thinking that for sex to be successful, they must use violence. Researchers in 2010 have watched the first 50 most viewed porn videos where 88% of the 304 scenes involved physical violence and 49% included verbal abuse.

Pornography also may be related to aggression and domestic violence. Dr. Jill Manning says that according to researches, regular watching of pornography may heighten the probability of aggression and domestic violence up to one third (31).

Pornography addiction is a great, serious, worldwide problem flourishing partially because of unregulated or erroneous use of technology of internet. In Great Britain the government is taking steps to ban violent pornography. Some argue governments should create a system that would make it difficult for teenagers under 18 to access websites with pornographic content, for example via ID etc. That is also because the average age boys get to a pornographic content world-wide is 13.

3.2.2. Video-gaming addiction

There are 100 million players world-wide actively playing every month and if all of the players formed a nation, they would be the fifth largest on earth – these are not numbers of all video-game players ever, that is just one game, the League of Legends (32). Video-gaming is one great branch of the technological progress and just like many technologies mentioned before has got an impact on the last several generations.

Brief history of videogames

First game named “Tennis for Two” was built on the former war coding analogue computer in 1958 – that started the idea and era of computer gaming (33). Together with first digital computers simple arcade games started to rise evolving in arcade machines present in the U.S. in 1970’s and legendary games like Atari’s Breakout, Super Mario Bros., Zelda, etc. The 16-bit computers brought around another graphical revolutions with games like Shadow of

the Beast or Sonic the Hedgehog. As computers would enhance so would the games and there could be many titles named but for the purposes of this thesis only few are worth being mentioned. One such game is “Counter Strike”, a third-person shooter game by Valve studio from 1999 which is being widely played till today. In 2004 a game significant especially for the game-addiction topic was born: The World of Warcraft – a very successful Massively Multiplayer Online Role-Playing Game (MMORPG) also played until present days. A game thriving on the online multiplayer as well was the 2009’s Minecraft with its open world (no borders), which, despite being a game with simple graphics, captivated many (“all time” statistics boast with 67 million players total (34)). Another revolution was caused by online video gaming that started thriving on providing games for free with in-game purchases such as League of Legends mentioned before or most up to date games of “battle royale” type like Fortnite or Playerunknown’s Battlegrounds. Once again, the list could be long but only for the overview essential for the thesis these are some milestones.

Video-gaming addiction

Despite not being often considered a serious addiction, video-gaming can take form of regular behavioral addiction with signs, symptoms, comorbidities and consequences similar to substance addiction disorder.

Among the ways to use the modern technologies video-gaming is showing to be as one of the less harmful as long as it might have a good influence on “reaction times, eye-hand coordination, problem solving skills, and be a source of positive self-esteem” (35). Despite the signs of addictiveness video-gaming may not appear to be as big issue from the view of addictology as other internet addictions. Many researchers (36) studying pathological gaming, however, agree on around 10% out of 220 to some 40 000 people tested on average show pathological signs. That might seem like a small number, still, the addiction is as strong as any other.

For a long time, medical classifications and manuals didn’t want to recognize videogaming as a disorder referring to lack of research. One of the researches trying to underpin validity of videogaming addiction was done by Daria Joanna Kuss and Mark D Griffiths, professor of Behavioral addiction at the Nottingham Trent University. Griffiths and Kuss elaborated many already existing researches meeting the requirements: to deal with internet video gaming addiction; be dated after the year 2000; and contain empirical data.

Griffiths and Kuss developed something called “The continuum of internet gaming

addiction” (37) which is a scheme depicting the circumstances and conditions of falling into an video-gaming addiction, what then the addiction looks like itself, how does it promote, and finally what are the consequences of such an addiction and possible manners of treatment.

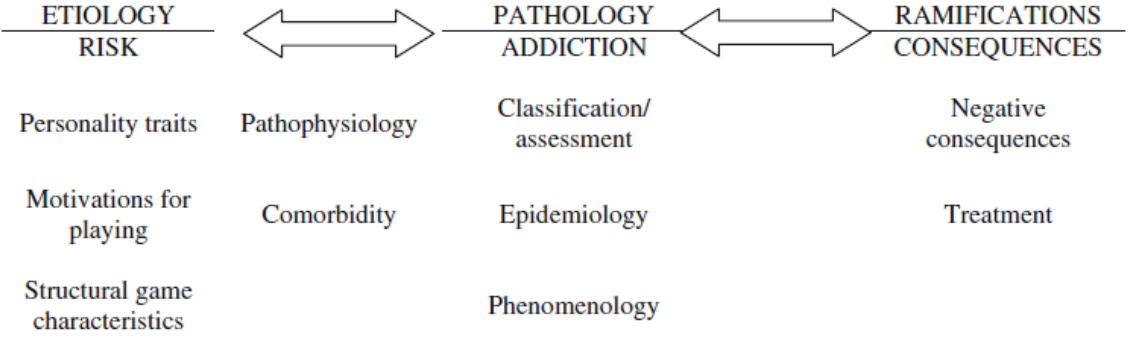


Figure 2: The continuum of internet gaming addiction (37)

There are several findings from Griffiths’ and Kuss’ research worth mentioning. The personal traits shared by the people who tended to fall in the addiction were avoidant interpersonal tendencies, loneliness and introversion, aggression and hostility and low self-esteem. That is an interesting fact because many of these characteristics are similar or the same as the characteristics related to the consequences of online gaming addiction like no real life relationships, aggressive/oppositional behavior and/or loneliness (37). That only points out one of the main problems that comes up with any of the internet/technology addictions and maybe even with substance addiction, that being that the effect is also the cause, the unbreakable negative cycle. To better explain – though there are characteristic traits that make an individual more or less probable to fall into the addiction, once in the addiction, what the “drug” (gaming) makes out of the individual (e.g. a person disliking social contact) is consequently what causes the individual to fall back in performing the activity. This closed loop then may repeat again and again.

One of the most addictive games, considered addictive not only by the specialists but even by the players themselves, is the World of Warcraft. By genre, it is the Massively Multiplayer Online Role-Playing Game (MMORPG) which is one of the main reasons it is so addictive. A player chooses an avatar and appears in the alternative open online world with achievements to accomplish. The players can form in groups – so called guilds – and accomplish more complex tasks together. Game with almost unlimited number of goals to achieve combined with possibility to anonymously socialize is a perfect recipe for an addiction. Even because when the player is absent in the game there is possibility that his “guild” is playing

at the moment, which might make the player play even when he/she knows it is not even good anymore.

In the present days there are facilities specialized on treating videogaming addicts with detoxication programs usually located in nature connected with manual work (on farms), psychological help, sharing groups and social activities. Some addicts visit the facilities more times than once before they can take control over their gaming addiction (11).

3.2.3. Social media addiction

Introduction

Pornography and video-gaming addictions are both “silent addictions”. That means that they are usually not performed in the public but rather in privacy and so the addicts are hard to be distinguished from non-addicts in public. Contrary to that, the demonstration of social media addiction is visible almost everywhere in wide public, mostly because of the contribution of portable smart devices. The social media addiction (SMA) was one of my original personal motivations to write this thesis. I would observe people on the tram, in the train, even in school – whenever there was a moment, small amount of time, when the people were not occupied with an activity or didn’t find the activity they were involved in interesting enough, they would simply turn to their devices, a smartphone or a laptop, and browse the social media. I started thinking – is that an addiction? What influence that must have on the ability of the individual to keep an attention. I would be talking to people, that I knew would use their personal devices excessively to check their social media, and it was obvious that their attention wasn’t with me, as if they couldn’t stop staying alert for their device to ring a notification. But in general, isn’t there a hidden, destructive process running in the background of all the innocent consistent phone-checking?

Microbreaks and attention

The Canadian branch of Microsoft company was making multiple researches on the attention span in the past. Interesting results came out comparing the ones done in 2000 and in 2013. The average time for which people could keep attention in 2000 was 13 seconds. Compare to that the attention span in 2013 was 8 seconds (as a “funny” note Microsoft mentioned that the goldfish’s average attention span is 9 seconds) (38). Though Microsoft

mentioned that the results may look likewise as those who originally had problems with attention were easier to start using social media, it is still vivid from the results that such option is unlikely. The main differences were found between young and old generation and it is hardly debatable whether such results are consequence of a whole generation being born with almost half the attention span than their ancestors or consequence to a whole generation being born into “the semiconductor age”². It is important to note that the study elaborated multiple types of attention – sustained (long-term attention), selective (the ability to select fast what information is important for future use and which not) and alternating (the ability to effectively switch between different cognitive tasks). The younger generation, and/or the participants who were using social media moderately or heavily, scored worse in the sustained attention, however, performed better in the tasks demanding the selective or alternating attention than the older generation or/and the ones using the social media moderately or not at all. That, however, still may be a problem and may prove why young people who experience SMA often report degradation in their academic performance (11).

Social media and smartphones

Important to realize is also the interconnection and interplay of social networks and portable devices. Portable devices made it possible for social media to be carried around everywhere; social media made portable devices not only incredibly attractive to use but also a component, that if missed, may result in user’s social exclusion because most of the social contact transferred to social media.

(Personally I remember countless number of parents dealing with the dilemma to buy their kids a smartphone because they observed the negative effects themselves, which they didn’t want their kids to be exposed to, but at the same time they would only collect the testimonials of the social exclusion of their kids.)

What they have in common?

SMA, like the porn addiction or the video-gaming addiction, is a behavioral addiction. There are many aspects that PA, VGA and SMA share, one of them being the relation to the brain’s reward circuitry. Social media, just like pornography, is an easily accessible medium that offers an inexhaustible amount of material to watch and consume that, when watched, makes brain release a certain amount of dopamine, smaller than heroin would, but greater than

² By „the semiconductor age“ the age of personal computers and portable devices is meant.

healthy (11).

Just like the previous addictions, SMA manifests some of the addiction symptoms like “persisting with substance use despite clear evidence of overtly harmful consequences” or “a strong desire or sense of compulsion to take the substance” (22) – in each of these quotations, of course, the substance needs to be replaced with the behavior.

An aspect, also crucial for building a real addiction, may it be substantial or behavioral, is the learning to use the substance or behavior to cover issue or trouble of any kind and is usually connected to emotion rather than to physical feeling (11). That makes possible connection between the use of social media and lack of real, person-to-person, social contact. The origin may be in starting using social media more and more, consequently to that the real social bonds may suffer and because the individual feels lonely, he/she wants to cover the emotional pain and because previously he/she would experience that using social media would be uplifting the person turns back to what used to cover the gap – the social media. The magical never-ending negative cycle closes, and the person becomes addicted to social media for it is the only “escape” from the pain.

4. THE NEGATIVE INFLUENCE OF THE USE OF TECHNOLOGIES ON SOCIETY

In previous chapters there were many references to how technologies may negatively influence an individual. Due to how many individuals use the novel technologies, however, it would be a miss not to step back with the perception of the device's influence and see it from society-wide perspective.

Once again, there are also positive fruits indeed. There are ways technologies influence society positively with (at least seemingly) no side effects. E.g. explanatory content which allows students to approach problematics and understand it to full scale at their own pace, or phones manufactured by the Vodafone Foundation that allow people experiencing domestic violence to start recording audio and call police to the locality of the phone by clicking a single button (39).

After that, there are effects of technologies which may seem positive at the first sight, however, if thought deeper through, this positivity may really only be apparent.

Information access has been enabled to masses equally. Many people have the same possibilities concerning accessibility of information. On contrary, it could be questionable whether the information didn't lose its quality for the cost of quantity. In a statistic published at statista.com J. Klement expects monthly traffic of data to be approximately 40 exabytes every month (10^{18} bytes) (40) which suggests at least the fact that the quantity is growing indeed.

In similar manner some may present the argument that technologies, internet and social media made it easier for people to connect and get to know each other. Once again, that may be truth in some cases, however, in many cases the use of social media paradoxically leads to isolation, loneliness and developing social anxiety (41).

Given topics will be further described in the following chapters.

4.1. The misuse of personal data

In the year 2016 Donald Trump became the president of the United States. Prior to surprise of many, even states that would have low voting rates in the past like Florida, Ohio or Pennsylvania, would now turn their votes to Trump (42). Consequently, suspicious pieces of information would rise up on surface.

A Netflix documentary “The Great Hack” follows the events preceding the victory of Donald Trump. The truth behind an unexpected victory actually resided in a tactics that enormously violated at least ethics, if not law, and which well illustrate another malicious way technology may be used, this time with respect to society.

In the affair a company called Cambridge Analytica (CA) would cooperate with Trump for the election. What happened was that the company collected data about Americans which would help them build a personality profile on almost every voter in the US (43). The manner in which the data were collected was one of the main issues. Before the elections Facebook would release a questionnaire. Each person filling this questionnaire would, by submitting it, agree with providing information not only about himself or herself but also about all the people this very person had added as friends on Facebook (44). Very soon CA had information about 50 to 60 million of US citizens – they could predict the behavior of each person in the database based on the personal information. In every state CA would then focus on the group of so called “persuadables” – people that wouldn’t vote in the previous years or that would seem not to have any certain opinion. Systematically CA would start showing these people content which would persuade them to finally vote for the candidate CA was working for. Based on the collected data about what the people like to watch and read CA would create targeted content that would subsequently lead them to shaping a desired opinion.

Brittany Kaiser, former employee of Cambridge Analytica who decided to speak against the company after the affair, labeled given method as a nation-wide psychological weapon (43). A good way for a group of several people to shape society according to their imagination.

In similar manner Cambridge Analytica used these tactics in elections at Trinidad where it persuaded the opponent social group to actually not vote based on social media trend the company would set up in the country. It was called “Do So!”. It was targeted on youth and

it was based on general resistance against politics (43). In the result the party CA worked for won the local election simply because the other political party had no voters – all of its previous voters were manipulated by artificially injected viral³.

The Cambridge Analytica ended its function in April 2018. The story is a good demonstration of the problematics of personal data collection.

In 2020 it is hardly possible to approach a website or set up an online service account without first accepting the Terms of use and Privacy policy. These Privacy policies contain many arguable and very reasonable conditions, like those justifying the company which is presenting these policies to store personal data that the user provides. Or that – for example in case of processing a payment for a product purchasable at the website – the website provides the information input to a third-party company.

Unfortunately, many of the statements are simultaneously applicable for not as justifiable purposes. Many companies do not specify to what third-party company it provides the collected data and what specific collected data it may provide. It is only then a matter of research what purpose the data are provided for. Additionally, specialists called *data brokers* manage special business dedicated to personal data and many companies are involved in that business (45). Once sold, it may be therefor very hard to track the data's further path.

What is also problematic is the way privacy policies are formed and presented. Due to fact, that it usually takes lawyers and attorneys hours to read through Privacy policies (46) how many daily users without juridical education possibly read through these policies?

In a research conducted by *Pew Research Center* on total number of 4 272 adult Americans 81% of them claimed “they have very little/no control over the data collects” (47). In the same survey only 22% said they read the privacy policies before agreeing to them (either always or often) out of which only 22% claimed to read the privacy policies all the way through (that is approximately 200 people out of the 4 272 in total) (47).

So, even though in many cases the personal data are taken on legal basis and websites boast with the status “We value your privacy” many of these companies rest and rely on the

³ Viral – „used to describe something that quickly becomes very popular or well known by being published on the internet or sent from person to person by email, phone.“ (51).

laziness of the users or, better put, on the almost insurmountable obstacle between the user and the act of data harvesting in the form of complex and voluminous texts of the Privacy policies.

Apart from cases in which the user is actually given the option to give the consent or leave the webpage or registration, there are occasions in which it is very easy to give away personal information without realizing that one has ever given the consent to do so – for example payment in a retail shop

It is hard to claim to what extent it is possible to protect self from the misuse of personal data. There are, however, possible practices applicable in personal attitude like using DuckDuckGo – a search engine that does not collect personal data as e.g. Google does. When entering a website another option to protect personal data is to disable the adjustable cookie settings if possible.

4.2. Substitute for social contact

It was mentioned in the chapter 3 that the use of social media may resolve in social anxiety. In a paradoxical manner the “social” media created by programmers to finally make it easy for a lonely man to find friends and socialize had exactly the reverse effect.

A pattern that seems to repeat itself throughout the thesis is applicable the same in the case of social contact. Apparently, the technologies are trying to reduce the effort of man necessary to achieve something which in the end is a principle with rather deteriorative effects. It would be a heresy to claim that social contact disappeared.

A good question may be: Isn't it actually (and at least partially) truth that social contact is only changing its form (to social media, videogaming etc.) but remains as healthy as the real social contact?

It depends what are the demands on the individual or the individual's expectations from life. Texting or social media will never fully supplement for real life contact. However, if the individual finds it sufficient to use the mean of communication and remain isolated inside the cultural context of the group (e.g. in the case of videogaming) and if it doesn't restrain the individual from preserving basic necessities of life (health, food, income, residence) than there is no reason to consider the influence negative.

On contrary there might be cases in which an individual desires personal contact. Because turning to digital device is way simpler than trying to create real connections the individual will try to supplement his or her needs with staying on social media. The real need remains unsatisfied which leads to feelings of loneliness, isolation and frustration (41).

Despite the preceding paragraphs describing individuals, individual is still a society unit. It is why I included this subchapter in the influence of the technologies on society, because if the presence of social media forces the ones who are less sociable to lean over to an antisocial attitude towards life and isolation instead of entering the social space and contributing to the society than the influence of the technology on the whole society through each unit is massive.

5. THE EXPERIMENTAL RESEARCH

Part of this bachelor's thesis is also an experimental qualitative research conducted in the local context. The research was led as a qualitative relational study, observing the influence of the use of Instagram app (and possibly its component called "Stories").

5.1. Hypothesis and aim of the experiment

Earlier in the thesis I mentioned the decline of the attention capability and addictiveness of the social media. Many users of social media today enjoy the feature called "Stories". Stories are a new way of promoting and consuming content online. What makes them attractive is that they are time limited, that being in two ways – the Stories post is only viewable for 24 hours and when a user clicks on the Stories post, there is a time countdown after which the Stories post disappears. One user can upload multiple Stories posts on his/her profile. Additionally, once the Stories feature finishes projection of selected user's Stories, it doesn't return to the home screen of the application but starts playing another Stories post. This creates a long line of content and makes it harder for the viewer to stop watching. The viewer ends up consuming a great amount of very small chunks of content which are not interconnected at all. So called "meme" videos or "Facebook video feed" are of similar nature. They provide great amount of short, unrelated and shallow content videos (jokes) that are in a queue.

Before people could carry around unlimited sources of information (or before any unlimited sources existed), human was exposed to way smaller and way more trackable amount of information. I should give an example. Taking a bus before the advent of smartphones was a unique time in the day. Person taking a bus was not tempted to pull out a phone and start reading news. People were left with no more possibilities but to look out of the window or talk to the person sitting nearby. Similar micropauses would appear throughout the day – waiting in a queue in a shop, resting after a workday. This was a time in the day human brain had no extra and brand-new input. There was silence or simply the noises of reality. The brain could rest and process other life events on the background.

Part of the hypothesis of this research is based on the assumption that average user was robbed of experiencing these natural breaks for brain with the advent of portable devices. Presently, it may be hard for a millennial, who grew up in the culture that allowed for the unlimited consumption of content, to take a bus to school without scrolling through any content.

Therefore, the research questions are:

Do current users experience moments of free time filled with nothing but silence?

Do current users consume content whenever there is nothing else to do? (On the bus, in a queue in a shop, at home).

What is the consequence of consuming content instead of staying in silence?

What is the consequence of consuming content whenever there is nothing else to do?

Does excessive content consumption affect mood and ability to work persistently?

5.2. The research method

The research was taken on 6 participants in time period of 5 days. Each of the participants agreed to download and install the *Moment* app into the personal mobile phone. For the five days the app was meant to measure the user's time spent on the phone (literally time when the screen of the phone was active) and on specific applications during the day.

The second part of the conduct was daily filling of a "Daily Questionnaire". In the questionnaire the user was asked to fill in approximate daily programme and routines accordingly to the prewritten timeline (time of waking up, regular meals, work, leisure time etc.) and corresponding mood experienced during the day. The mood could have been expressed via circling appropriate emoticon. There were three emoticons – one smiling, expressing good mood; one with a neutral face, expressing a neutral mood; one frowning, expressing a bad mood. The respondent was given space to describe the emotions more specifically in a given space (see Annex n.1).

The last part of the experiment was filling out an online form which was designed to collect important additional information about the user's context and about his or her

perception of the phone usage. The form was filled out online and was made using the “Typeform” online platform for creating surveys and researches. It consisted of 25 questions (see Annex n.2).

The desired data were to be obtained from the measurement of the time spent on the Instagram daily (the participants were obviously not told that the Instagram usage is being observed) and questions specifically aimed on the Instagram use in the final questionnaire that took place at the very end of the measurement (so the participants couldn’t deduce the experiment’s focus on Instagram).

During the experiment three out of the six participants experienced problems with the functionality of the Moment app. Two of the three provided data for two days out of the five days of measurement, therefore, in many graphs and cases only 5 participants will be mentioned.

5.3. The results of the experiment

5.3.1. Questions focused on the time with no input information

In the questionnaire the participants were directly asked if they happen to experience moments through the day when they do not process any sort of information. Out of the six only one person stated she does not experience these moments too much, other replied positively – meaning they do experience moments of no input information from the phone.

Strictly in the context of the group this result might suggest that the hypothesis won’t be examinable. However, in the following question the participants who expressed they experience the “blank moments” were asked to provide more details.

- User 5 stated that these moments are “usually rather shorter” because she doesn’t like to experience loneliness.
- User 6 admitted that the number of these moments is lowering.
- User 4 stated that if at home, she would not resist the possibility to be on the phone after a while.
- User 3 expressed that these moments are usually experienced at home adding

that he would always start doing an activity that he would stop doing after a moment. This might be linked to persistency in activity which the user stated as “2” (second worse, see Sheet 2).

- Only User 1 expressed that the pauses are long.

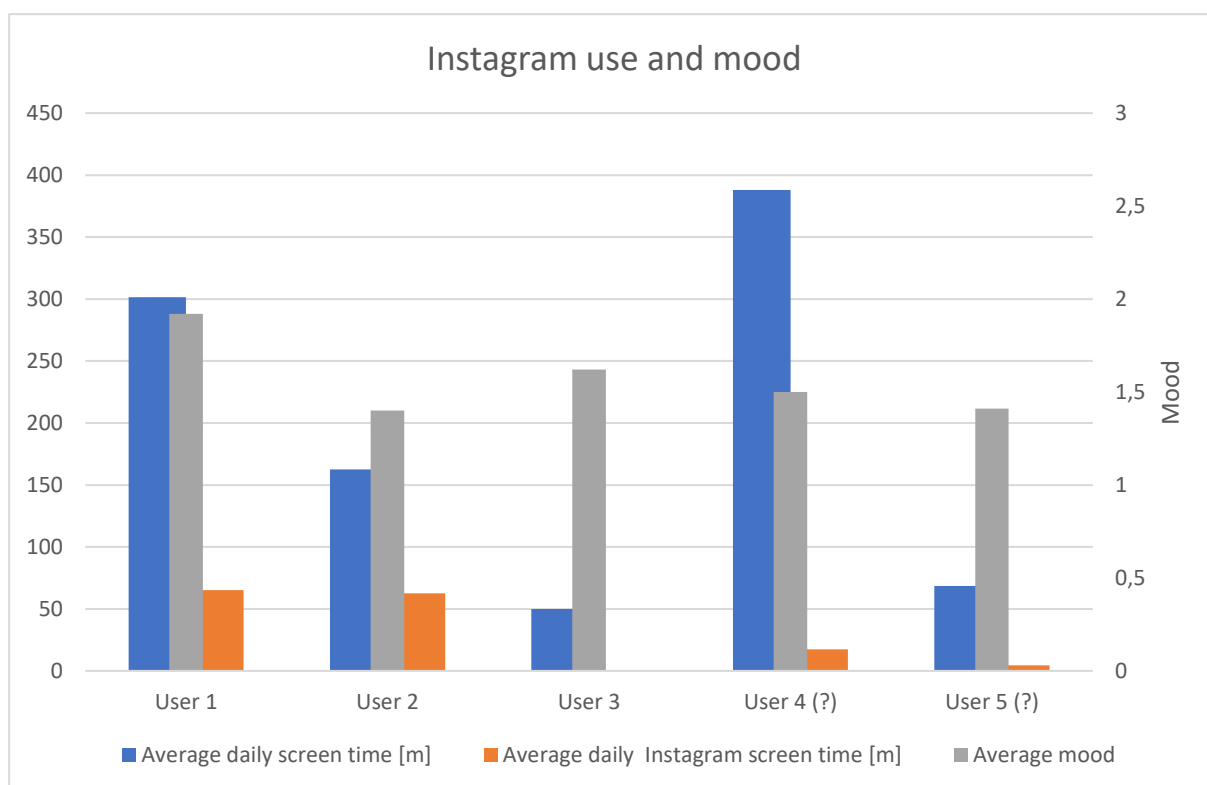
Despite most of the participants first replying, they experience natural moments with no input all of them admitted these moments are either very short, decreasing in number or attempted to be interrupted with different activity. From that it could be said that users don't find it favorable to experience such moments.

5.3.2. The relation between mood and the use of the Instagram app

Based on the data drawn from the research it could be stated that there is a relation between the average daily use of the Instagram app and average mood. Statistically, those of the participants who measured the average daily Instagram use 50 minutes and higher, evaluated their mood as worse in general (1,66 in average) compare to the participants who measured their time less than 50 minutes daily (in this case it could be said that less than 20 minutes daily) - they evaluated their mood as 1,51 on average.

Instagram use and mood			
	Average daily screen time [m]	Average daily Instagram screen time [m]	Average mood
User 1	301,5	65,25	1,92
User 2	162,4	62,6	1,4
User 3	50	0,22	1,62
User 4 (?)	388	17,5	1,5
User 5 (?)	68,5	4,5	1,41

Sheet 1



Graph 1

It is interesting that even in such a small number of participants, certain statistical relations between the use of Instagram and mood are observable.

The average screen time of the User 4 is so much above the average, because the user is using the phone to watch video content at the Netflix platform.

It is crucial to mention that mood is a quality influenced by number of other factors, e.g. the whole living context – users 1, 2 and 4 are students still living with their parents, user 3 is a working man living alone and user 5 is a student living in marriage.

As of the personalized results concerning mood, there are also several other interesting findings.

In the daily questionnaire the User 1 mentioned that the phone was “annoying him” and distracting him whenever he would attempt to study for school. In 13 out of 15 cases he mentioned using phone during the day he evaluated the mood as “2” (neutral) or “3” (bad mood). These statements could have been influenced by the user’s assumption that the study is going to track the negative influence of the use of phone.

5.3.3. The relation between ability to work persistently and the use of the Instagram app

In the final questionnaire the users were asked to express how good they think they are in persistent work on scale from 1 (I can't concentrate) to 5 (I am able to perform persistent work for longer than hour without being distracted). The question was aimed on persistent work related to work or school (it is usually not hard to remain persistent in hobby, this question was aiming on the ability to be persistent with duty).

14 → Jak zvládáš dělat souvislou činnost, která tě nebaví, ale dělat jí musíš? (učení se do školy, statická činnost v zaměstnání)

1 = Nedokážu se soustředit 5 minut v kuse, potřebuji změny.

5 = Nedělá mi problém se na práci soustředit hodinu a déle bez přerušení.

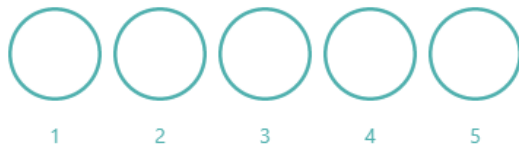


Figure 3 - Question number 14

Translation:

14

eventually must do it? (studying, static activity in your occupation)

1 = I cannot concentrate for 5 minutes straight, I need change.

5 = It is not a problem for me to focus on the work for hour and more.

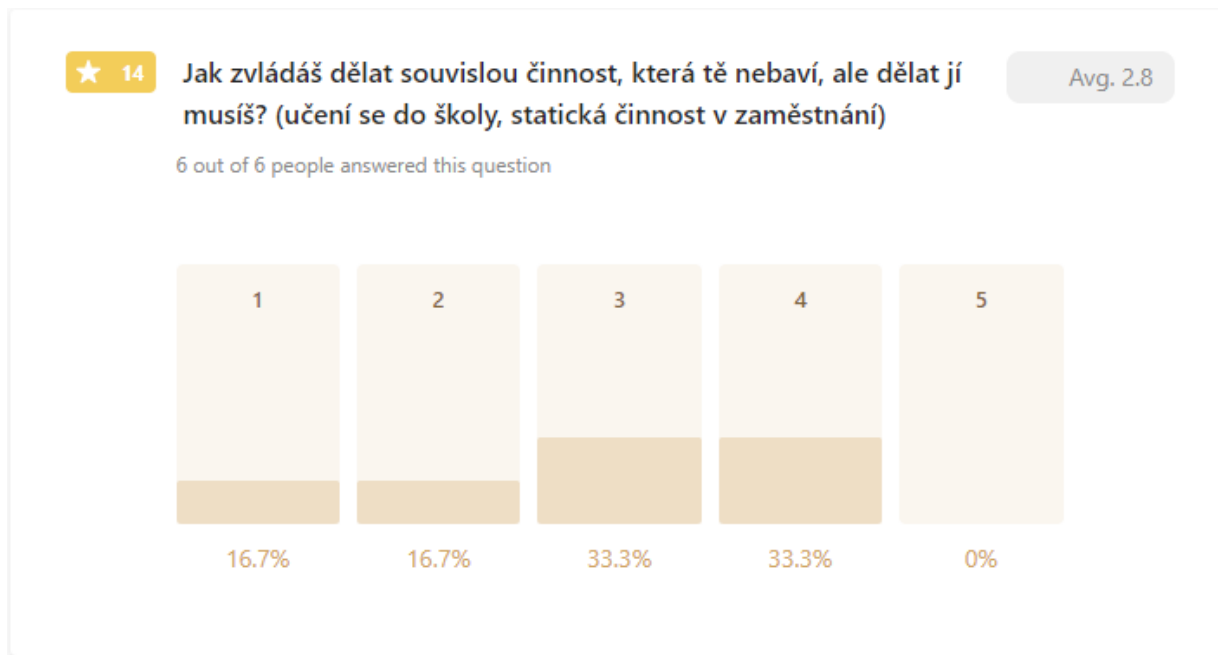


Figure 4 - Results to question number 14

Translation:

*14 *ke to do, but*
you eventually must do it? (studying, static activity in your occupation)

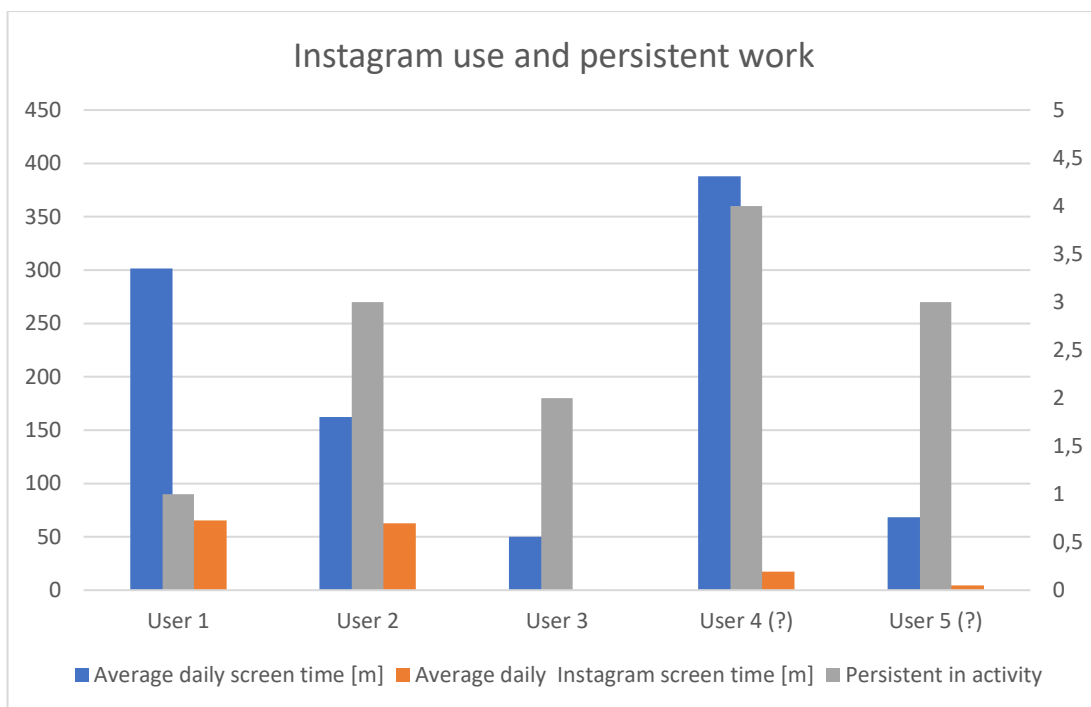
6 out of 6 people answered this question

Concerning the reliability of the data, it would be better for the persistency to be measured instead of just evaluated by the participants based on their subjective opinion.

Yet, similarly to the relation between the use of Instagram and mood, there is a statistical relation between how users evaluated their ability to work persistently and the average use of the Instagram app.

Instagram use and persistent work			
	Average daily screen time [m]	Average daily Instagram screen time [m]	Persistent in activity
User 1	301,5	65,25	1
User 2	162,4	62,6	3
User 3	50	0,22	2
User 4 (?)	388	17,5	4
User 5 (?)	68,5	4,5	3

Sheet 2



Graph 2

The participants who measured the average Instagram screen time more than 50 minutes a day, had evaluated themselves less capable of persistent work (equal to 2) compare to those who measured Instagram daily screen time being less than 50 minutes, whose average evaluation of their persistency would be 3.

5.3.4. Other interesting results

Besides the results mentioned earlier in this chapter, there are other interesting results drawable from the research.

- All of the respondents who live with other people – either partner or parents and family – admitted they spend time on phone in physical presence of other people.
- 3 out of 6 respondents mentioned that physical activity is not a way for them to relax.
- The participant who measured the least average screen time is the only participant who only works and does not study anymore. Relationally that might be caused by the fact that in his occupation he spends time with workers of higher average age than the students who spend time with age relatives.

5.4. Summary and insights

5.4.1. Summary

Relatively to the hypothesis the research was successful in confirming that though users experience time intervals during which they would consume no additional input from the phone or other novel information sources they either do not find favor in such moments, these moments are getting shorter or these moments decrease on number.

To better evaluate, whether it is the shallow content which negatively influences the users, it would be better to have contrast data to compare the present data with. What would work well as contrast data would be, for example, evaluations of the mood and persistent work from time before the users started using the phones or making the users spend certain amount of time with only limited time with the phone.

In the least the participants in the research group could've been compared among each other while all the factors that could possibly influence their answers were known.

Still, despite the apparent small reliability that the research group will provide constructive data, the results worked in favor of the hypothesis. The indicators of the influence of shallow content (the mood and persistent work) revealed to be influenced

negatively from statistical perspective.

5.4.2. Interesting insights

As soon as I started explaining that the experiment is going to consist of measuring the screen time, most of the participants immediately started acting as if presuming that the influence of screen time is negative. I had to persuade them that technologies may also have positive effect. The fact that there is natural notion that the way the users spend their time on their phones is not good is at least interesting, but probably naturally supports the hypothesis of the research.

6. CONCLUSION

This work is voluminous. It would be hard and maybe even pity to reflect on the whole work in one paragraph. There are several general thoughts I would like to reflect in the following subchapters that formed with the research and observing.

6.1. The decreased level of effort

In the chapter 4.2 – Substitute for social contact – I already mentioned this term. But I will mention it again as a reaction to the whole work. The technology in general has always been a mean to simplify and ease work. Similarly, in the case of modern technology, the desire was to decrease the level of effort needed to achieve what desired.

In case of the portable devices and devices providing access to the internet, however, and maybe for the first time in history, the demand for effort has been decreased beyond what would be a healthy measure. The “simplification” of the tasks crossed the line of *useful* and proceeded to area, where the simplification became subject to business with seemingly attractive but in reality, deteriorative tools.

May it be achieving knowledge, creating relationships or obtaining a content to consume I believe, and the research of this thesis proved, that lowering the level of effort needed to obtain these is simply eroding man’s character and qualities.

6.2. Technology as a tool of man

Though this thesis is called “Threats and negative influence of the use of technologies” many times during the writing I realized how much all the findings reveal about the nature of man.

One aspect of the nature is observable at the users. They tend to choose an easier option, even if it only provided an apparent solution. Despite this is a natural behavior it is not a good behavior. Such attitude should not be supported but challenged.

In a similar way, another bad inheritance of human is to prioritize the self over others. The companies that thrive on promoting attractiveness, while selling a harmful substitute for reality, are a good example of that. People may know that what they do is not good, but as long as it brings wealth to them there why should they stop?

It is important to realize that technology is still only a dead tool given to the hands of living and responsible man and promote such responsibility in the academical environment.

6.3. Promotion of technologies

After cigarettes were found to be harmful, it took a long time to put across laws that made it compulsory for cigar vendors to place a warning about the harmful effects of smoking on the cigarette boxes. It is not a matter of coincidence that the Czech paper edition of the book “Irresistible” by Adam Alter about the addictiveness of technologies has a picture of smartphone in a cigarette box on its cover.

Social media, smartphones and novel technologies are presented as attractive, flawless and harmless. Dozens of researches proved that not to be true. As a person fighting for truth, healthy society and individual, I would love to once see a law that would force social media providers to place a sign on the top of the feed of their applications and webpages warning the user about the possible harmful effects of the excessive use of social media and about its addictive character.

7. ROZŠÍŘENÝ ČESKÝ ABSTRAKT

7.1. Úvod

Moderní technologie k osobnímu použití ve formě počítačů, tabletů a mobilních telefonů v dnešní době prostoupily velkou část společnosti. Přes tři miliardy lidí v dnešní době vlastní chytrý telefon – to je téměř půlka lidské populace (1). Vzhledem k tomu, jak velký vliv používané technologie mohou mít je třeba dobře studovat nejen jejich pozitivní přínosy, ale také možné negativní vlivy.

Tato práce je zaměřena právě na tyto negativní vlivy a zkoumá je ze tří úhlů pohledů. První z nich krátce naskytuje pohled na negativní vlivy používání technologií na fyziologii člověka. Druhá, největší a hlavní část práce se věnuje negativnímu vlivu technologií z pohledu psychologie – komentovaný je vliv na kognitivní funkce mozku a behaviorální závislosti na technologiích, zvláště pak na sociálních médiích, pornografii a hraní videoher. Třetí část se věnuje možnému neblahému vlivu technologií na funkci společnosti.

V závěru se práce věnuje praktickému průzkumu vedenému na šesti respondentech. Průzkum i kapitoly budou blíže popsány v samostatných krátkých kapitolách.

7.2. Vliv používání technologií na fyziologii člověka

V této kapitole byly shrnuty dvě hlavní oblasti – nevalný vliv práce s telefony a počítači na ruku (záněty šlach) a vliv sedavých prací na držení těla, vliv vadného držení těla na ostatní lidské funkce.

Typický uživatel používá svůj mobilní telefon několik hodin denně. Pro ovládání telefonu používá velká část uživatelů palec stejné ruky, která telefon drží a malíček téže ruky k jeho vyvažování. Jelikož jsou oba prsty přetěžovány a palec často vykonává velké množství drobných pohybů v tenzi, dochází k zánětu šlach spojujících prsty s paží (4). Stejně ohrožená

je potom paže v oblasti lokte, kde jsou šlachy také často v přepětí z důvodu držení telefonu s ohnutou paží. Z podobných příčin vznikají záněty šlach při nadměrné práci s počítačem. Při práci s počítačem navíc vzniká problém špatného držení těla. Bederní páteř je vyhrbená důsledkem oslabených vnitřních břišních svalů. Důsledkem toho vzniká v bederní páteři nadměrná lordóza (prohnutí – viditelné ve stoje) a naopak v hrudní části páteře nadměrná kyfóza (vypoulení páteře). Důsledkem toho se hlava dostává do předsunu před tělo, ramena se zavírají směrem k hrudi, tuhnou trapézové svaly a vzniká nebezpečí bolestí krční páteře. Vlivem „uzavření hrudníku“ se zmenšuje kapacita plic, což může mít vliv na okysličování krve, které je důležité pro správnou funkci mozku a srdce.

Kromě pravidelného cvičení jsou nápomocné ergonomické pomůcky jako např. stojan na počítač, který drží monitor ve výšce očí, nebo stůl uzpůsobený pro práci ve stoje pro možnost střídání sedu a stání.

7.3. Negativní vliv používání technologií na psychologii člověka

7.3.1. Vliv na kognitivní funkce člověka

Kognitivní funkce mozku jsou funkce spojené s přijímáním informací a jejich následným zpracováním (9). Řadí se mezi ně také pozornost a paměť. To jsou právě kognitivní funkce mozku, které začínají být moderními technologiemi ohrožovány. Kanadská pobočka firmy Microsoft provedla v letech 2000 a 2013 testy pozornosti, ze kterých zjistila, že průměrná pozornost u lidí klesla ze třinácti na osm sekund (38). Jiný průzkum zkoumal vliv používání aplikace Instagram a Snapchat na paměť člověka (48). Výsledky prokázaly, že paměť se zhoršuje s tzv. kognitivním odkládáním, pokud si uživatelé jen rychle fotí nějakou dočasnou situaci, a to i proto, že začnou svoji pozornost věnovat obsluze aplikace. Dle těchto průzkumů tedy tyto moderní technologie mají negativní vliv na kognitivní funkce člověka.

7.3.2. Závislost na sociálních médiích, pornografii a videohrách

Mobilní telefony umožnily mít při sobě neustále zařízení s velkým množstvím možností. To je také to, s čím jsou moderní technologie propagovány – neomezenost, možnost vykonávat velké množství úkonů všude a pořád. Ač je tato vlastnost na první pohled atraktivní s postupem času vyplývá, že má spíše negativní vlivy.

Mnoho průzkumů ((11) (23)) prokázalo, že sociální sítě jsou návykové. Řadí se mezi tzv. behaviorální závislosti. Ty se liší od látkových závislostí tím, že uživatel má nutkání vracet se k úkonům, které ho krátkodobě uspokojují, ale dlouhodobě mají špatné účinky. Těmi jsou v případě sociálních sítí paradoxně osamělost, izolace a sociální úzkost (41). Sociální sítě byly navrženy tak, aby měl uživatel potřebu se k nim průběžně vracet, což je s přenosnými zařízeními ještě snadnější.

Dalším typickým úkazem návykovosti je uvolňování dopaminu. Ten se v mozku ve zdravé míře běžně uvolňuje při dosažení určitého úspěchu, nebo uspokojení klasické potřeby (žízení). Látkové drogy typicky uvolňují velké množství dopaminu, což také nutí uživatele se ke droze vracet. Podobně je tomu v případě sociálních médií, dávka dopaminu je ale menší. Velkou závislostí je potom závislost na pornografii, která velmi ovlivňuje i oblast sexuality. Této závislosti je v práci také věnovaná celá kapitola. Méně problémové jsou potom videohry, jelikož alespoň na rozdíl od sociálních médií a pornografie rozvíjejí u jedinců určité schopnosti (36).

7.4. Negativní vliv používání technologií na společnost

V této kapitole jsem se zaměřil především na nebezpečí v podobě sběru dat o uživateli a jejich pozdějšímu použití. Zmínil jsem příklad zneužití osobních dat společností Cambridge Analytica v amerických volbách v roce 2016, nebo při kauze Brexit. Zmínil jsem také problematiku komplikovanosti Podmínek použití na webových stránkách. Tyto podmínky jsou často sepisovány právníky, a tudíž je těžké pro běžného uživatele se v nich zorientovat.

7.5. Praktický průzkum

V rámci práce jsem provedl krátký a spíše kvalitativní průzkum. Účastnilo se ho 6 lidí

z různých prostředí v přibližně stejném věku (18–22) a trval pět dní. Během průzkumu byl účastníkům měřený čas strávený na jejich mobilním zařízení. Průzkum byl zaměřený na používání aplikace Instagram a na její vliv na emoce a schopnost dělat souvislou činnost. I přes malý vzorek bylo z průzkumu pozorovatelné, že uživatelé, kteří trávili v průměru v aplikaci Instagram déle času (nad 50 minut) hodnotili svoji náladu hůř než uživatelé, kteří na Instagramu trávili času méně (pod 20 minut). Podobně tak hodnotili hůř svoji schopnost vykonávat dlouhodobou souvislou činnost.

7.6. Závěr

V závěru práce jsem zmínil celkem tři názory.

V tom prvním reaguji na snížené požadavky na snahu člověka. Mám dojem, že to je téma, které prostupuje práci ve všech třech kapitolách. Technologie sice člověku několik úkonů ulehčily, možná poprvé v historii ale zavedly ulehčování až za hranici zdraví. To, že člověk nemusí vydat úsilí, aby si našel přátele, ho paradoxně vede k izolaci a k přátelstvím, která jsou jen zdánlivá ale nereálná. To, že člověk nemusí vydat úsilí, aby uspokojil svoje sexuální potřeby, ho vede k izolaci a k sexuálním prožitkům, které jsou zdánlivě příjemné ale jinak nereálné a ubližující.

V dalším bodu závěru zmiňuji, že je třeba pamatovat na to, že technologie jsou nástrojem člověka. Mnohokrát v průběhu psaní jsem nabýval zdání, že práce vypovídá více o charakteru člověka než o charakteru technologií. Tudiž ač můžou mít technologie špatný vliv je vždy zodpovědností člověka, zda se tomuto vlivu poddá, nebo vystaví.

V posledním bodu závěru jsem kritizoval způsob, jakým jsou technologie propagovány. Propagaci jsem přirovnal k propagaci cigaret v minulém století. Poté, co doktoři prokázali negativní vlivy kouření trvalo ještě nějakou dobu, než se způsob propagace cigaret změnil. Podobně jako v případě sociálních médií tomu zabraňoval hlavně finanční zisk, který ač těžil na poškozování uživatelů, byl velký. Jsem zastáncem názoru, že v budoucnu by aplikace mohly varovat před jejich návykovým charakterem podobně, jako je tomu dnes u cigaret.

8. Annexes

8.1. Annex 1 – The daily questionnaire

Denní dotazník Datum: 4. 6. 2020

Do kolonky **Aktivity** vyplň prosím zhruba a upřímně náplň svého dne.
V kolonce **Emoce** zakroužkuj prosím smajlíka, který nejlépe odpovídá pocitům, které jsi v daném čase měl/a. (Emoce můžeš více popsat v prostoru vpravo).

	Aktivity	Emoce		
7:00	vstávání			
9:00	jóga snídaně	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
11:00	učení			
13:00	oběd	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
15:00	vylet			
17:00		<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
19:00	večeře			
21:00	učení seriál	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
23:00				
1:00	spánek	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3:00				

Translation:

The daily questionnaire

Date:

*Please, fill **honestly** and **approximately** what was your programme through the day into the column called **Activities**.*

*In the column **emotions** please circle the emoticon that the best describes the emotions that you felt at the given time. (You can describe the emotions more closely in the space on the right).*

Activities

Emotions

8.2. Annex 2 – The final questionnaire

8.2.1. The Czech original

	1	2	3	4	5
#	Dobře. Vyplň prosím svoje TestID:	Kolik je ti let?	Jakého jsi pohlaví?	Studuješ? Pracuješ? Obojí?	Máš nějaké koníčky? Pokud ano, jaké?
User 5	976146	22	Žena (Dívka)	Obojí	Procházky, hospůdky, jízda na kole, seriály, kamarádky
User 6	863372	22	Muž (Chlapec)	Studuji	Hiking, bushcraft, sport, grafická práce
User 4	752256	18	Žena (Dívka)	Studuji	Zpěv, horolezení, zpěv, dancing around, zpěv
User 3	468795	23	Muž (Chlapec)	Pracuji	Focení, Hra na kytaru, PC Gaming
User 2	711236	21	Žena (Dívka)	Obojí	turistika, hraní na piano a flétnu, čtení knih, sledování seriálů a filmů
User 1	618133	22	Muž (Chlapec)	Studuji	Auta, moderní technologie a klavír, na který bohužel už skoro vůbec nehraju.

	6	7	8	9
#	Jakými způsoby rád/a odpočíváš?	Jsou způsoby odpočinku, po kterých se necítíš odpočatý?	Vyber tvrzení, které je o tobě spíše pravdivé:	Stane se ti někdy přes den, že máš chvíli, kdy nezpracovááš žádné informace?
User 5	Jdu se projít, povídám si s kamarády, koukám na nenáročný seriál nebo na youtube video , žehlím	Ano, třeba moc dlouhý výlet	Více si odpočinu ve společnosti lidí.	Ano, tyto chvíle občas mívám.
User 6	Poslech hudby nebo audioknih, procházka	nope	Více si odpočinu o samotě.	Ano, tyto chvíle občas mívám.
User 4	Čtením knížky, koukáním na Netflix/YouTube , jen tak ležením třeba na zahradě	Sport, chození se psem	Více si odpočinu ve společnosti lidí.	Ano, tyto chvíle občas mívám.
User 3	Rád si dopřeji odpoledního šlofička .	Odpočinek ve formě fyzické aktivity/sportu.	Více si odpočinu o samotě.	Ano, tyto chvíle občas mívám.
User 2	sleduji film nebo čtu knihu	ne	Více si odpočinu o samotě.	Vlastně ani ne.
User 1	Nějakým způsobem neumím odpovědět. Asi posloucháním hudby?	Civění do mobilu?	Více si odpočinu o samotě.	Ano, tyto chvíle občas mívám.

	10	11	12	13
#	Pokud jsi v předchozí otázce odpověděl/a "Ano,..." mohl/a bys odpověď *stručně* specifikovat?	Jaké je tvoje zaměření? (Co studuješ / co děláš v zaměstnání?)	Vyber tvrzení, které je o tobě spíše pravdivé:	Pokud nežiješ sám, trávíš někdy čas na telefonu v přítomnosti druhých v domácnosti?
User 5	Jsou většinou kratší , nevydržím být dlouho o samotě.	Studuji pedagogiku.	Žiji s partnerem/partnerkou.	Ano, trávím.
User 6	Popravdě jich je čím dál míň. Například pouze ležím v posteli na pár minut, nebo když někam jdu a nemám sluchátka	Právnická fakulta	Žiji s partnerem/partnerkou.	Ano, trávím.
User 4	Když jdu se psem (bez sluchátek), tak třeba i přes 1 hodinu. Ale většinou nic nedělám jen na chvíli. Pak mi to nedá a jsem na mobilu/uklízím.	Biskupské gymnázium, německý a anglický jazyk, biologie a chemie	Žiji s rodinou.	Ano, trávím.
User 3	Občas zkrátka není do čeho píchnout a nemám náladu nic dělat. Poté se uchýlím k tomu, že nic nedělám. Probíhá to tak, že třeba vezmu do ruky kytaru a ihned ji položím. Zapnu počítač a foto editor a ihned to vypnu a jsem moc smutný, že mě nic nebaví. Poté doufám, že se mi někdo začne věnovat a něco s ním podniknu, což většinou tento stav ukončí. Popř. jdu spát, pokud jsem se zrovna nevzbudil.	Jsem technik datové optické sítě v energetické společnosti.	Žiji sám/sama.	Žiju SÁM!
User 2		studuji bohemistiku	Žiji s rodinou.	Ano, trávím.
User 1	Někdy i dost dlouhé. Probíhají přibližně tak, jak si to vystihl v minulé otázce - dlouhé minuty koukání nikam a na nic. Podobá se to trochu mikrosnání ve své podstatě.	Vysoká škola.	Žiji s rodinou.	Ano, trávím.

	14	15	16	17	18
#	Jak zvládáš dělat souvislou činnost, která tě nebaví, ale dělat jí musíš? (učení se do školy, statická činnost v zaměstnání)	V jakém roce jsi dostal svůj první mobilní telefon se systémem Android nebo iOS?	Vyber tvrzení, které je o tobě spíše pravdivé:	Jakým způsobem se typicky (nejvíce) dopravuješ do práce / do školy ?	Používáš telefon při přemísťování se mezi domovem a prací / školou?
User 5	3	2012	Mobil chci mít stále u sebe. Beru si ho i na záchod.	MHD	Ano
User 6	4	2013	Mobil si hlídám, ale zvládnu být bez něj.	Chůze	Ano
User 4	4	Když mi bylo 11 let (2013)	Mobil si hlídám, ale zvládnu být bez něj.	Auto	Ano
User 3	2	Sony Xperia Sola. Dostal jsem ho v druháku na SŠ takže cca 2014/15.	Mobil chci mít stále u sebe. Beru si ho i na záchod.	Auto	Ano
User 2	3	2015	Občas jsem schopný na mobil zapomenout po celý den.	Vlak	Ano
User 1	1	Přelom let 2013 a 2014	Mobil chci mít stále u sebe. Beru si ho i na záchod.	MHD	Ano

	19	20	21				
#	Pokud jsi v předchozí otázce odpověděl "Ano" k čemu telefon obvykle při dopravě používáš?	Používáš (obecně) aplikaci Instagram?	K čemu používáš aplikaci Instagram?				
User 5	Poslouchání podcastů	Ano	Prohlížení příspěvků	Prohlížení Stories			
User 6	Poslouchání hudby	Ano	Prohlížení příspěvků				
User 4	Poslouchání hudby	Ano	Prohlížení příspěvků	Prohlížení Stories			Psaní zpráv
User 3	Poslouchání hudby	Ano	Prohlížení příspěvků	Prohlížení Stories	Přidávání příspěvků	Přidávání Stories	Psaní zpráv
User 2	Poslouchání hudby	Ano	Prohlížení příspěvků	Prohlížení Stories	Přidávání příspěvků	Přidávání Stories	
User 1	Sociální sítě (Instagram, Facebook)	Ano	Prohlížení příspěvků	Prohlížení Stories	Přidávání příspěvků	Přidávání Stories	Psaní zpráv

	22	23					
#	Vyber tvrzení, které je o tobě spíše pravdivé:	Co je to, co na internetu, sociálních sítích, YouTube, nejčastěji vyhledáváš?					
User 5	V aplikaci Instagram mám osobní účet + spravuji další účet (např. organizace, firmy).	Videa o tématech, která mě zajímají	Filmy a seriály				
User 6	V aplikaci Instagram mám osobní účet + spravuji další účet (např. organizace, firmy).	Videa o tématech, která mě zajímají			Hudbu		Věci do školy / do práce
User 4	V aplikaci Instagram mám pouze osobní účet.				Hudbu	Zábavu (memes, vtipná videa)	Věci do školy / do práce
User 3	V aplikaci Instagram mám pouze osobní účet.	Videa o tématech, která mě zajímají			Hudbu	Zábavu (memes, vtipná videa)	
User 2	V aplikaci Instagram mám osobní účet + spravuji další účet (např. organizace, firmy).	Videa o tématech, která mě zajímají	Filmy a seriály		Hudbu		
User 1	V aplikaci Instagram mám pouze osobní účet.	Videa o tématech, která mě zajímají			Hudbu	Zábavu (memes, vtipná videa)	

#	Používáš i jiná zařízení, než mobilní telefon?	
User 5	Ano, počítač.	
User 6	Ano, počítač.	
User 4	Ano, počítač.	
User 3	Ano, počítač.	Ano, tablet.
User 2	Ano, počítač.	
User 1	Ano, počítač.	

8.3. English translation

	1	2	3	4	5
#	Please fill in your TestID.	How old are you?	What is your gender?	Do you work? Do you study? Do you do both?	Do you have any hobbies? If yes, what hobbies do you have?
User 5	976146	22	Woman (Girl)	Both.	Walks, pubs, bike riding, TV shows, friends.
User 6	863372509	22	Men (Guy)	I study.	Hiking, bushcraft, sport, graphics.
User 4	752256	18	Woman (Girl)	I study.	Singing, climbing, singing, dancing around, singing.
User 3		23	Men (Guy)	I work.	Photography, Guitar playing, PC gaming
User 2	711236	21	Woman (Girl)	Both.	Hiking, playing piano and flute, watching TV shows and movies.
User 1	618133	22	Men (Guy)	I study.	Cars, modern technologies and piano, which I, unfortunately, almost don't play at all

	6	7	8	9
#	What are the ways you like to rest?	Are there ways of resting after which you do not feel rested?	Choose the option which is most true about you.	Does it ever happen to you that you would have a moment in the day which you would not embrace any additional information?
User 5	I go for a walk, talking to friends, watching some simple TV show or youtube video, ironing.	Yes, for example a too long hike.	I relax more in the company of other people.	Yes, I experience these moments.
User 6	Listening to music or to audiobooks, a walk.	Nope	I relax more by myself.	Yes, I experience these moments.
User 4	Reading a book, watching Netflix, YouTube, just laying down in the garden	Sport, walking a dog	I relax more in the company of other people.	Yes, I experience these moments.
User 3	I like to take a nap in the afternoon.	Relax in the form of physical activity/sport.	I relax more by myself.	Yes, I experience these moments.
User 2	I watch a movie or I read a book.	No	I relax more by myself.	Not really.
User 1	Somehow I don't know how to answer. Litening music I guess?	Staring into phone?	I relax more by myself.	Yes, I experience these moments.

	10	11	12	13
#	If you answered "Yes,..." in the previous question, could you please specify these moments?	What is your aim? (What do you study? What do you do for living?)	Choose the option which is most true about you.	If you don't live alone, do you ever spend time on phone in the presence of other people?
User 5	They are usually short, I can't stay alone for too long.	I study pedagogy	I live with a partner.	Yes, I do.
User 6	To be honest there's less and less of these moments. For example I just lay in my bed for a few minutes, or if I go somewhere and I don't have headphones.	Law School	I live with a partner.	Yes, I do.
User 4	When I walk my dog (without the headphones) it can be more than an hour. Usually, though, I do nothing only for a moment. Then I can't resist and I'm on the phone or I'm cleaning around.	Biskupské gymnázium (Bishop's gymnasium), German and English, Biology and Chemistry	I live with family	Yes, I do.
User 3	Sometimes there's just nothing to do and I don't feel like doing anything. Then I recourse to doing nothing. It looks the way that I for example grab my guitar and immediately I lay it back again. I turn on computer and photo editor software but I turn it off immediately and I'm very sad that there is nothing that would entertain me. Then I hope that someone will pursue me and that we will do something together. That is where the moment ends. Eventually I go to sleep in case I just didn't wake up.	I am a technician of the data optical network of a company.	I live alone.	I live ALONE.
User 2		Czech studies	I live with a family.	Yes, I do.
User 1	Sometimes they are actually pretty long. They go in a similar way you described in the last question. - long minuts of staring nowhere and at nothing. It's basically similar to microsleep.	University	I live with a family.	Yes, I do.

	14	15	16	17
#	How do you manage doing persistent activity, which you don't like to do, but you eventually must do it? (studying, static activity in your occupation) 1 = I cannot concentrate. 5 = It is not a problem for me.	In what year did you get your first smartphone?	Choose the option which is most true about you.	By what mean of transport do you travel the most? (To work / to school).
User 5	3	2012	I want to have my phone always with me. I even take it to the toilet.	Public transport
User 6	4	2013	I keep notion about my phone but I can stay away from it.	Walking
User 4	4	When I was eleven (2013)	I keep notion about my phone but I can stay away from it.	Car
User 3	2	Sony Xperia Sola. I got it in the second year of my secondary school, so approximately 2014/15.	I want to have my phone always with me. I even take it to the toilet.	Car
User 2	3	2015	Sometimes I'm able to forget about my phone for all day long.	Train
User 1	1	Between 2013 and 2014	I want to have my phone always with me. I even take it to the toilet.	Public transport

	18	19	20
#	Do you use your phone while moving?	If you answered "Yes" in the last question - what do you usually use the phone for?	Do you in general use the Instagram app?
User 5	Yes	Listening to podcasts	Yes
User 6	Yes	Listening to music	Yes
User 4	Yes	Listening to music	Yes
User 3	Yes	Listening to music	Yes
User 2	Yes	Listening to music	Yes
User 1	Yes	Social networking (Instagram, Facebook)	Yes

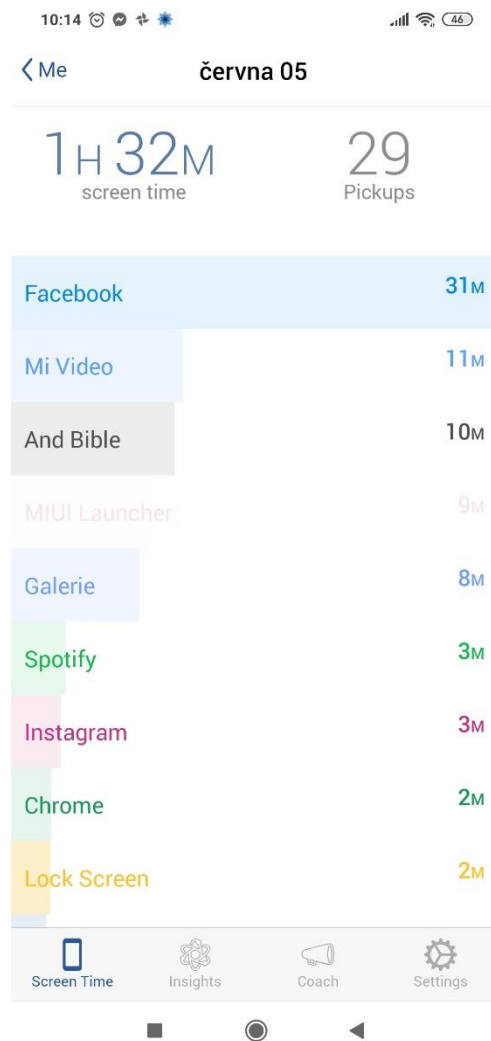
	21				
#	What do you use Instagram for?				
User 5	Viewing the posts	Watching Stories			
User 6	Viewing the posts				
User 4	Viewing the posts	Watching Stories			Messaging
User 3	Viewing the posts	Watching Stories	Adding posts	Adding Stories	Messaging
User 2	Viewing the posts	Watching Stories	Adding posts	Adding Stories	
User 1	Viewing the posts	Watching Stories	Adding posts	Adding Stories	Messaging

	22	24	
#	Choose the option which is the most true about you.	Do you also use other devices?	
User 5	I have my personal account + I manage other accounts (Company or Organization)	Yes, computer.	
User 6	I have my personal account + I manage other accounts (Company or Organization)	Yes, computer.	
User 4	I only have personal account	Yes, computer.	
User 3	I only have personal account	Yes, computer.	Yes, tablet.
User 2	I have my personal account + I manage other accounts (Company or Organization)	Yes, computer.	
User 1	I only have personal account	Yes, computer.	

What are the things that you usually search for on the internet or You Tube?

Videos about topics I'm interested in.	Movies and TV shows				
Videos about topics I'm interested in.			Music		Things for school / work
			Music	Fun (memes, funny videos)	Things for school / work
Videos about topics I'm interested in.			Music	Fun (memes, funny videos)	
Videos about topics I'm interested in.	Movies and TV shows		Music		
Videos about topics I'm interested in.			Music	Fun (memes, funny videos)	

8.4. Annex 3 – Example of measured time



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