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ADDICTIVE BEHAVIOUR ON THE INTERNET

Thesis

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I declare that I have written this thesis independently and all cited resources have been listed in the references.

Praha, 31 May, 2014

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Content

- 1. Introduction..... 7
- 2. Theoretical background 9
 - 2.1. Behavioural addiction 9
 - 2.1.1. Defining the concept 10
 - 2.1.2. Classification of behaviour addictions..... 11
 - 2.1.3. Behavioural addiction in the context of diagnostic manuals of mental disorders 12
 - 2.1.4. Similar traits of behavioural and substance addictions 14
 - 2.2. Internet addiction 23
 - 2.2.1. Historical background and main research areas..... 25
 - 2.2.2. Identification of Internet addiction 27
 - 2.2.3. Prevalence rates of Internet addiction..... 31
 - 2.2.4. Correlates of Internet Addiction 34
 - 2.2.5. Treatment of Internet addiction 36
 - 2.2.6. Future research directions..... 38
 - 2.3. Prevention of addictive behavior on the Internet..... 50
 - 2.3.1. Introduction 50
 - 2.3.2. Targeting the vulnerable part of the population or specific skills..... 51
 - 2.3.3. Preventive interventions 53

2.3.4. Future directions in prevention	56
3. Comparing Addictive Behaviour on the Internet in the Czech Republic, Chile and Sweden.....	64
3.1. Introduction	64
3.2. Country profiles	66
3.3. Methods	67
3.4. Sample description	69
3.5. Two dimensions of addictive behaviour on the Internet: comparing Chile, the Czech Republic and Sweden.....	73
Dangerous activities online	78
3.6. Revealing dimensions of addictive behaviour on the Internet: the Czech Republic.....	80
3.7. Discussion and Conclusions.....	84
4. Motivation of MMORPG Players with Addictive Behaviour in Relation to Internet Use.....	94
4.1. Introduction	94
4.2. Methods, sample and data analysis	99
4.3. Results	102
4.4. Discussion and conclusion.....	110
5. Addictive behaviour on the Internet – case study	121
5.1. Theoretical introduction	121
5.2. Case study.....	122

5.3. Discussion	131
5.4. Conclusion	134
6. General discussion.....	139
6.1. Prevalence of addictive behaviour on the Internet in the Czech Republic..	140
6.2. Online activities with addictive potential	141
6.3. Motivation for playing online games	142
6.4. Motivation for limiting online games	143
6.5. Dimensions of addictive behaviour on the Internet.....	146
6.6. Limitation and recommendation for the further research.....	147
7. Conclusion	155

1. Introduction

The origin of Internet reaches to 1960s and early 1970s. From that time on its development came through many stages and these days this system is widely used all over the world and many people could not imagine or just with real difficulty their life without it. Besides many positive effects Internet has well its dark side. This dissertation thesis deals with one part of this dark side: addictive behaviour on the Internet.

The goal of this dissertation is to look at the phenomenon of addictive behaviour on the Internet from several points of view. Theoretical part of this thesis overviews the basic knowledge of this topic which is placed in the context of the wider category of addictive behaviour. Research articles illustrate this phenomenon on three levels: general population level, group level and individual level First paper (study I.) deals with addictive behaviour on the Internet on the general level by providing its prevalence in the general population in the Czech Republic and compares the results with those in Chile and Sweden. The second paper (study II.) maps motivation of addictive behaviour on the Internet in the group of MMORPG players and the third article (study III.) is a case study of the development of addictive behaviour on the Internet and its treatment.

This thesis consists of individual articles and the logic of the composition of the whole thesis. It includes the following texts; the brackets at the beginning always mention the author's contribution of the dissertation thesis submitter:

(80 %) Vondrackova, P., & Smahel, D. (2012). Internet addiction. In Z. Yan (Ed.), *Encyclopedia of Cyber Behavior* (pp. 754 – 767). IGI Global: Hershey, PA.

(35 %) Šmahel, D., Vondráčková, P., Blinka, L., & Godoy-Etcheverry, S. (2009). Comparing Addictive Behaviour on the Internet in the Czech Republic, Chile and Sweden. In G. Cardoso, A. Cheong, & J. Cole. (Eds), *World Wide Internet: Changing Societies, Economies and Cultures* (pp. 544-582). Macao: University of Macau.

(100 %) Vondráčková, P. (2011). Závislostní chování na Internetu - případová studie [Addictive behaviour on the Internet – Case study]. *Česká a Slovenská psychiatrie*, 107(5), 577 - 583.

(90 %) Vondráčková, P., & Šmahel, D. (2012). Motivation of MMORPG Players with Addictive Behaviour in Relation to Internet Use. *Adiktologie*, 12(1), 24 – 34.

2. Theoretical background

The chapter Behaviour addiction is based on the paper Vacek, J., & Vondráčková, P. (under review) Behaviourální závislosti [Behavioural addiction]. Česká a Slovenská psychiatrie. The chapter Internet addiction consists of a chapter in the edited book: Vondrackova, P., & Smahel, D. (2012). Internet addiction. In: Z. Yan (Ed.). Encyclopedia of Cyber Behaviour (pp. 754 – 767). IGI Global: Hershey, PA.

2.1. Behavioural addiction

The concept of nonsubstance or behavioural addiction has started to emerge in psychiatric literature since 1980 besides the concept of addiction to psychoactive substances (Lobo & Kennedy, 2006). In this context, psychiatrists and psychologists talk about addiction to gambling (Potenza, 2006), Internet addiction (Young & de Abreu, 2010), food addiction (Gearhardt et al., 2012) or sex addiction (Levine, 2010). In some literature one may encounter such curiosities as the carrot addiction (Kaplan, 2009), chocolate addiction (MacDiarmid & Heterington, 1995), exercise addiction (Crossman, Jamieson, & Henderson, 1987) or tanning addiction (Nolan et al., 2009). The reaction to this fact is the growing effort of clinical and academic experts for a new, broader conceptualization of the concept of addiction (e.g. Miller, 1980; Warburton, 1990; Larkin & Griffiths, 1998; Orford, 2001; Shaffer et al., 2004), because in

both current versions of diagnostic manuals (ICD-10, DSM-IV) the term addiction is associated only with addiction disorders, which are caused by the use of a psychoactive substance, more precisely, with a diagnosis of dependence syndrome (Smolík, 2002).

2.1.1. Defining the concept

Addiction is defined as a complex disorder whose core diagnostic feature is the repeated urge to use a substance or indulge in certain behaviour despite its negative consequences (Hollen, 2009). Marlatt and colleagues define similarly addictive behaviour as a recurring pattern of behaviour that increases the risk of health, personal or social problems. Addictive behaviour is defined subjectively as experienced loss of control and occurs despite the efforts of abstinence or moderate use. Typically, such a pattern of behaviour is characterized by immediate satisfaction (short-term benefits) and is often accompanied with delayed harmful effects (long-term costs). Attempts to change addictive behaviour (treatment or self-help) are usually characterized by a high degree of relapse (Marlatt et al., 1988).

Experts distinguish between two basic types of addiction: (a) physical addiction, which is reflected by the fact that people are addicted to psychoactive substances due to certain physiological processes that are caused by these substances in the body, and (b) mental or behavioural addiction, when people display basic elements of addictive behaviour in relation to certain activities (Hollen, 2009).

For the latter group of disorders, there are many different terms. In addition to the behavioural addiction other terms are also used such as non-substance

addiction (Frascella et al., 2010), non-chemical addiction (Marks, 1990), process addiction (Hollen, 2009).

Griffiths (1996) defines six basic components of behavioural addiction, whose presence in the clinical picture is a condition for establishing this diagnosis: (a) salience (particular activity becomes the most important activity in the life of an individual and dominates his thinking, feelings and behaviour), (b) mood modification following the initiation of an activity that has the character of a coping strategy, (c) tolerance, (d) withdrawal symptoms, (e) interpersonal or intrapersonal conflict, and (f) relapse. These criteria largely overlap syndrome diagnostic criteria for substance addiction in both classification manuals (Smolík, 2002).

2.1.2. Classification of behaviour addictions

Behavioural addiction is currently from the medical point of view divided into (a) the currently recognized and already classified diagnoses, and (b) new, not already classified disorders.

Among the recognized ones a group of disorders classified as habit and impulse disorders (F63) is included. This category includes pathological gambling, pathological stealing (kleptomania), pathological fire-setting (pyromania) and trichotillomania. Signs of addictive behaviour can be traced mainly to two other diagnostic categories: hyper sexuality (F52.7) as sex addiction, bulimia nervosa (F 50.2) and overeating associated with other psychiatric disturbances (F50.4) as a food addiction (Ifland et al. 2009; Marks, 1990).

Group of new behavioural addictions is much broader, and a variety of potential disorders corresponds to all human activities, because it is possible to

have addiction to basically any behaviour that brings satisfaction (Marks, 1990). In connection with the development of modern (especially information) technology, the consumer character of our society and the orientation of Western society on the performance it is possible to distinguish the following categories: technological dependency (computers, Internet, games, mobile phones, television, etc.), shopping addiction (oniomania), workaddiction (workaholism) and self-harm behaviour. There are of course an endless myriad of other possible activities to which people can become addicted.

2.1.3. Behavioural addiction in the context of diagnostic manuals of mental disorders

As mentioned in the introduction in both current diagnostic manuals of mental disorders (DSM-IV and ICD-10) the definition of addiction is only associated with mental disorders that are caused by the use of a psychoactive substance, specifically with the diagnosis of dependence syndrome (Smolík, 2002). An operational definition of addiction therefore, in both manuals therefore covers only the use of psychoactive substances. The majority of behavioural addictions are included in the category habit and impulse disorders in the ICD-10 or impulse control disorders in DSM-IV. In the draft of the DSM-V revision, which is going to be final in 2013, experts have tried to extend the category of addiction reflecting the fact that the category should include both substance and behavioural addiction. So far this section includes only pathological gambling and Internet addiction is recommended for further study (American Psychiatric Association, 2012).

In the nineteen nineties, some experts suggested that some behavioural addiction should be placed in the category of obsessive-compulsive disorder due to similar symptoms and response to pharmacotherapy and psychological interventions (Black et al., 2010; Dell Osso, et al. 2006). The reason for such a classification was the argument that such behaviour is compulsive, because its function is to reduce anxiety or other painful affects (Goodman, 2001). In the course of time, there were many objections to this concept which have been subjected to research scrutiny. The objections were that the nature of addictive behaviour cannot stand on obsessive-compulsive symptoms. Addictive behaviour is at least in the initial phase described as ego-syntonic because it brings pleasure. In contrast, obsessive-compulsive symptoms are unpleasant symptoms, which are obsessive, meaningless and ego-dystonic. Therefore it is behaviour that does not bring pleasure and satisfaction because relief cannot be regarded as a pleasure. The addictive behaviour is partly motivated with anxiety or distress reduction, but it brings pleasure and satisfaction as well, which particularly in the early stages contributes to the development and maintenance of addiction (Black et al., 1997; Goodman, 2001; Myers, 1995; Rinehart & McCabe, 1998). Finally tangible evidence against this classification resulted from research studies focused on response to antidepressant medication. For an obsessive-compulsive disorder a strong reaction to the newer antidepressants that increase serotonin activity, such as fluoxetine (Prozac) and clomipramine (Anafranil) is typical. On the other hand, the reaction of desipramine, which has little effect on the activity of serotonin, is weak. The research also found that the symptoms of sexually addicted people who suffered from depression improved with their emotional state, while the condition of those who also suffered from

obsessive-compulsive disorder did not improved, although their status in relation to obsessive-compulsive disorder was better (Goodman, 2001).

According to the current version of the International Classification of Diseases (ICD-10), the most behavioural addictions categorized as habit and impulsive disorders (F63) are placed in DSM-IV in the category of impulse control disorders. These disorders are classified as pathological gambling (gambling), kleptomania, pyromania and trichotilomania. American DSM IV classification still describes the so-called intermittent explosive disorder, which includes several bounded episodes of loss of control of aggressive impulses (Smolík, 2002; World Health Organization, 1992). All categories of habit and impulsive disorders (F63) share three characteristics: a) inability to resist the impulse or temptation to do something that is considered as dangerous, b) the individual is aware of the growing tension before the act, c) affected state of arousal or satisfaction when impulsive action realized (Smolík, 2002). Here we can say that the habit and impulse disorders share a phenomenologically similar definition as addiction, but the object of addictive behaviour is not an addictive substance but a behavioural activity.

2.1.4. Similar traits of behavioural and substance addictions

Clinical observations and experimental studies indicate that the substance and behavioural addictions share some common features, which justifies their common classification and that the only difference is the fact that the individual is not addicted to a substance, but is addicted to the behaviour or the feeling experienced by acting out the behaviour.

Common features can be divided into four main areas (a) genetic and neurobiological, (b) personality, (c) social and (d) clinical characteristics. (Frascella et al., 2010; Grant et al., 2010).

(A) Genetic Characteristics

Many surveys have been carried out in this area. Their results, however, support the fact that there is a common genetic basis between substance and behavioural addictions. Small family studies of individuals diagnosed with pathological gambling, kleptomania and oniomania found that first degree relatives have a significantly higher lifetime prevalence of substance dependence (Grant et al., 2006; Grant et al., 2010). Similar results provide molecular genetic studies (Grant et al., 2010; Potenza, 2006).

(B) Neurobiological characteristics

Neurobiological research proves that addictive substances and as well our sensory perception and behaviour stimulate the same brain reward system, to which is attributed the primary role in the development and maintenance of addiction (Váchová et al., 2009). This system includes several neurotransmitter systems. The biggest role in the regulation of rewarding behaviour has dopaminergic and endogenous opioid system. Research shows that both the use of psychoactive substances and addictive behaviour activate both these brain areas (Grant et al., 2006; Han et al., 2012; Karim & Chaudhri, 2012; Potenza, 2006).

(C) Personal characteristics

Some behavioural addictions share some common personality traits with substance addictions. Pathological gambling shares the most common features with substance addiction. For example, persons with a diagnosis of pathological gambling exhibit similar traits of impulsivity and novelty seeking (Potenza, 2006). People with these diagnoses also have a shared preference of small but immediate rewards to greater rewards in the long term (Petry, 2001). Another study found deficits in both groups in the time estimate, inhibition, cognitive flexibility and planning (Goudriaan et al. 2006).

(D) Clinical characteristics

Substance and behaviour addictions exhibit similarity in the development and the course of the disorder as well as in their symptoms. Both groups of disorders often begin in adolescence and early adulthood, and generally their prevalence the highest in these age categories (Grant et al., 2010). The time course is in both addictions similar and is also manifested in the chronic patterns of behaviour with frequent relapses (Grant et al., 2010). The addictive behaviour of both of them is preceded by a tension or arousal and followed by relief. The craving frequently occurs due to emotional dysregulation (de Castro et al., 2007; World Health Organization, 1992). Further in behaviour addictions we can find an effect similar to tolerance, when is needed to conduct more frequent or increased intensity of behaviour in order to achieve the same effect (Blanco et al., 2001; Grant et al., 2006). Persons with behavioural addictions report dysphoric moods in case the addictive behaviour doesn't continue, but in comparison with

substance addictions classical withdrawal symptoms of physiological nature are absent (Pies, 2009).

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2.2. Internet addiction

Internet addiction can be defined as overuse of the Internet leading to impairment of an individual's psychological state (both mental and emotional), as well as their scholastic, occupational, and social interactions (Beard & Wolf, 2001). Internet addiction bears similarities to drug addiction, and is therefore included with pathological gambling, compulsive shopping, sex addiction, and eating disorders in the category of nonchemical addiction behaviour (Hall & Parsons, 2001). But "Internet addiction" is not explicitly included in the diagnostic manuals. In June 2007, the American Medical Association discouraged the American Psychiatric Association from including "Internet Addiction Disorder" as a formal diagnosis in the next edition of the DSM (Diagnostic and Statistical Manual of Mental Disorders) (Grohol, 2007). The main reasons against Internet addiction's inclusion are that symptoms of Internet addiction are likely to be the symptoms of other disorders, such as depression or obsessive-compulsive disorders, and that creating a separate category for this pathology will further expand an already fast growing list of supposed "disorders" and undermine the public's trust in psychiatric diagnosis (Pies, 2009).

Kimberly Young (1998b) a well know researcher in this field, describes Internet addiction as follows: *"Internet addiction is defined as any online-related, compulsive behaviour which interferes with normal living and causes severe stress on family, friends, loved ones, and one's work environment. Internet addiction has been called Internet dependency and Internet compulsivity. By any name, it is a compulsive behaviour that completely dominates the addict's life."*

Other researchers, however, do not agree with using the term "Internet addiction" and use several other terms, such as "Internet pathological use" (Morahan-Martin & Schumacker, 2000; Davis, 2001), "compulsive Internet use" (Black et al., 1999), "Internet addiction disorder" (Chou et al., 2005), "problematic Internet use" (Beard, 2005; Shapira et al., 2003; Caplan, 2002) and also "Internet dependency" (Chen et al., 2001; Wang, 2001).

Some of the most typical online activities related to Internet addiction include: online gaming (research is mainly focused on Massive-Multiplayer Online Role-Playing Games (MMORPG)), excessive online communication (e-mail communication, chat-rooms, and social networking sites), cybersex activity overload (visiting online pornographic sites and initiating cybersex relationships), and online gambling (betting on the Internet) (Šmahel et al., 2009; Subrahmanyam & Šmahel, 2010). Due to limited space this chapter does not focus specifically on any of these activities. We recommend readers seek further books and articles which describe problems with these activities in more detail (i.e. Subrahmanyam & Šmahel, 2010).

In this chapter we will first present the historical view of the phenomenon of Internet addiction, and the main areas of research in this field: the major surveys regarding prevalence rates of Internet addiction and the correlates of Internet addiction. We will then introduce the contributions of the major researchers who focused on defining its core components, designing measurement scales, diagnostic criteria, and treatment approaches.

2.2.1. Historical background and main research areas

The phenomenon of problematic use of computers has been discussed since the late eighties. In 1989 Margaret E. Shotton published the book "Computer Addiction? A study of computer dependency" presenting an investigation of the syndrome of computer addiction based on case studies of volunteers from all over the UK who considered themselves to be dependent upon computers. She arrived at the conclusion that "computer dependency" exists but that it was not a clinical pathology, and nor did it constitute a threat to computer users themselves.

The concept of Internet addiction was first used by the New York psychiatrist Ivan Goldberg in 1995. Although he intended his text describing the diagnostic criteria of this new mental disorder as a joke for the amusement of the online community, the name and description of the disorder has been used ever since. In 1996, American clinical psychologist Kimberley Young published the results of a two-year study of Internet behaviour and misuse, and placed the phenomenon of Internet addiction in a clinical context. This study gained wide public attention through media reports, and the popular and professional debate surrounding Internet addiction grew (Reed, 2002). Young founded The "Center for Internet Addiction", focused on studying various aspects of Internet addiction. She investigated the basic aspects of Internet addiction, which were later further developed by other researches. Young distinguished basic types of Internet addiction (online gaming, online gambling, online affairs, compulsive surfing and cybersex-cyberporn), developed the Internet Addiction Test, designed the first diagnostic criteria of Internet addiction, and introduced treatment approaches based on cognitive-behaviour principles (Young, 1998a, 1998b, 1999, 2007).

One of the first tasks for researchers was to find out how to identify “Internet addiction”. An early and significant contribution to this area was made by Young (1998) who developed the Internet Addiction Test: a 20-item questionnaire that measures mild, moderate, and severe levels of Internet Addiction. Young was the first to try to design the diagnostic criteria of Internet addiction. Another important contribution to the methods of identifying Internet addiction was made by Griffiths (2000a, 2000c) who defined the core components of Internet addiction: salience, mood modification, tolerance, withdrawal symptoms, conflict and relapse. Both Young’s test and Griffiths’s components will be described in more detail in the next section of this chapter.

The next area in this field, prevalence estimates of Internet Addiction, is made up of different pieces of research which are hardly comparable as we explain next. Prevalence estimates range from 0.3% to 5.7% in the general population, and from 1.6% to 38% in the population aged 16-24 years (e.g. Aboujaoude et al, 2006; Bakken et al., 2009; Zhang et al., 2008). Prevalence rates are especially high in Asian countries with wide Internet access, such as South Korea and China who consider Internet addiction as a serious problem and have decided to address it at a governmental level (Fackler, 2007). The results of research on online addiction prevalence are further addressed in a later section of this chapter.

Researchers were also interested in the possible causes of Internet addiction, and its possible negative impacts. Because longitudinal research on this topic is very rare, we typically do not know the impact or the causes of Internet addiction. Therefore the next chapter is called the “Correlates of Internet Addiction”, where we describe four basic areas connected with this

problem: academic and occupational, relationships, physical and mental health, and finances.

Kimberly Young (1996, 1998a, 2008) is also a significant researcher in the area of Internet addiction treatment and has published several texts focused on psychological treatment approaches to Internet addiction. Her interventions are based on principles of cognitive-behavioural therapy. The other school describing treatment of Internet addiction comes from Korea. Kim (2007, 2008) introduced a group psychosocial program for addicted college students inspired by the principles of reality therapy. Both of these schools are described in a separate section of this chapter.

2.2.2. Identification of Internet addiction

The first effort to identify Internet addiction was made by Young (1998a) who developed a brief diagnostic questionnaire based on the DSM-IV criteria of pathological gambling. Experiences with this questionnaire were later used in designing the 20-item Internet Addiction Test (IAT) (Young, 1998a). Table 1 shows an example of the 10 items from Young's questionnaire, the full questionnaire can be found on the Center for Internet Addiction's Website ¹. Young proposed the first diagnostic criteria of Internet addiction by modifying the DSM-IV criteria for pathological gambling.

¹ WWW: http://www.netaddiction.com/resources/Internet_addiction_test.htm

Table 1: Internet addiction Test (Young, 1998)

Answers on the scale:

(0) Never (1) Rarely (2) Occasionally (3) Frequently (4) Often (5) Always

1. How often do you find that you stay on-line longer than you intended?
2. How often do you neglect household chores to spend more time on-line?
3. How often do you prefer the excitement of the Internet to intimacy with your partner?
4. How often do you form new relationships with fellow on-line users?
5. How often do others in your life complain to you about the amount of time you spend on-line?
6. How often do your grades or school work suffers because of the amount of time you spend on-line?
7. How often do you check your e-mail before something else that you need to do?
8. How often does your job performance or productivity suffer because of the Internet?
9. How often do you become defensive or secretive when anyone asks you what you do on-line?
10. How often do you block out disturbing thoughts about your life with soothing thoughts of the Internet?

Another important researcher in this area is Mark Griffiths (Griffiths, 2000a, 2000b; 2000c; Widyanto & Griffiths, 2007) who suggested the following six basic components of Internet addiction (Griffiths, 2000a). His components are based on the general criteria of DSM IV:

a) **Salience**: when the particular online activity turns out to be the most important activity in the person's life and governs their thinking (e.g. imagining being online when not), feelings (e.g. craving to play a particular online game),

and behaviour (e.g. chatting with online friends all the time, neglecting basic human needs such as eating and sleeping).

b) **Mood modification:** a subjective experience influenced by the pursued online activity (e.g. experiencing a tranquilizing feeling of “escape” or “numbing”, and a feeling of irritation when cannot be online).

c) **Tolerance:** the process whereby increasing amounts of the particular online activity are required to achieve the former effects.

d) **Withdrawal symptoms:** unpleasant feeling states and/or physical effects (e.g. the shakes, moodiness, irritability) that come about when the specific online activity is discontinued or suddenly limited.

e) **Conflict:** disagreements between the addicts and those around them (interpersonal conflict) or from within the individuals themselves (intrapersonal conflict) associated with the online activity.

f) **Relapse:** tendency for repeated decline into earlier usage patterns of the online activity, and for even the most extreme patterns typical at the height of the addiction to be quickly restored after a period of relative control.

A high score on all six dimensions could suggest that a person is addicted. Through five case studies, Griffiths (2000a) showed that when individuals exhibited problems in only some dimensions excessive use was purely symptomatic, and the Internet was used to counteract other deficiencies, such as problems in relationships, concerns about physical appearance, disabilities and so on.

For this reason, a high score on some questionnaires may not really indicate that an Internet user is addicted, but rather that their excessive use is symptomatic of other issues. Psychologists and counselors should therefore be

careful when using the questionnaires of Young and others, which do not distinguish between addiction and excessive use. The question of criteria objectivity and the validity of self-reported questionnaires also remain open. The main tool in the diagnosis of Internet addictive behaviours should be a clinical interview. This was also stated by Beard and Wolf (2001), "*diagnosis should be based on the extensive clinical interview and the results of any testing that was completed. The clinician should be able to see whether the information obtained fits the suggested criteria to diagnose Internet addiction.*" (p. 379).

Beard and Wolf (2001) expressed concern as to whether current criteria is sufficient in diagnosing Internet addiction. They claimed that while the term "addiction" is used Internet addiction does not compare to substance related disorders, and yet the criteria for pathological gambling are often applied. Their suggestion is that impulse control disorder would be closer to what current questionnaires measure. Based on this, Beard and Wolf went on to create new criteria for the diagnosis of Internet addiction (p. 381).

To confirm Internet addiction all the following points (1–5) must be present:

- 1) The person is preoccupied with the Internet, thinks about online activity or anticipates the next session on the Internet.
- 2) The person needs to use the Internet for increasing amounts of time in order to achieve satisfaction.
- 3) The person has made unsuccessful efforts to control, cut back, or stop Internet use.
- 4) The person is restless, moody, depressed, or irritable when attempting to cut down or end Internet use.
- 5) The person stays online longer than originally intended.

Additionally, at least one of the following criteria must be present:

- 1) The person has jeopardized or risked the loss of a significant relationship, job, educational or career opportunity because of Internet use.
- 2) The person has lied to family members or others to conceal the extent of their involvement with the Internet.
- 3) The person uses the Internet as a way of escaping from problems or of relieving a dysphoric mood (e.g. feelings of helplessness, anxiety, and depression).

According to Beard and Wolf (2001), the last three criteria impact the pathological Internet user's ability to cope with problems and feelings (such as depression and anxiety) and influence interactions with other people in life (such as family members). We can say that they emphasize the importance of the conflict between Internet use and the individual's ordinary life.

There are also other questionnaires inspired by the aforementioned core components and diagnostic criteria, and experts have constructed various methods for assessing Internet addiction (e.g. CIAS - The Chen Internet Addiction Scale, OCS - Online Cognition scale, IRABI - Internet-related addictive behaviour inventory) (Brenner, 1997; Davis et al., 2002; Ko et al., 2005).

2.2.3. Prevalence rates of Internet addiction

Many surveys focusing on the prevalence of Internet addiction have been done resulting in prevalence rates which vary widely from study to study, see Table 2. The disadvantages of these surveys are: low uniformity in the definitions employed, assessment methods used, and the number and character of the surveys' participants. In order to find the prevalence many studies used

Internet-based survey design (e.g. Hur, 2006; Young, 1998b) and samples of high school and college students (e.g. Zhang et al., 2008; Cao & Su, 2006). A possible explanation for measuring prevalence in adolescents may be the assumption that Internet addiction is primarily a problem affecting young people, as well as the fact that students are the most available group for researchers. Nevertheless, all the aforementioned facts strongly affect the validity of prevalence estimates. Where more representative samples were selected and the surveys were realized in the general population, not only among Internet users, the prevalence rates tended to be lower (e.g. 0.3% in Aboujaoude et al., 2006 and 3.4 % in Smahel et al., 2009) than in online studies on samples of adolescents (e.g. 18% in Niemz et al., 2005 and 13% in Sherer, 1997). Likely the most methodologically rigorous study was carried out by Aboujaoude and his colleagues (2006) in the US. This study involved a random telephone survey of 2,513 adults aged 18 and above. The prevalence ranged from 0.3% to 0.7%.

When looking at demographic characteristics, Internet addiction appears to be more common among men than women (e.g. Niemz et al., 2005; Johansson & Gotestam, 2004). Morahan-Martin and Schumacker (2000) explain the preponderance of men by the fact that men are most likely to express interest in information technologies in general, and further express interest in Internet applications with addictive potential, like games, pornography and gambling. Regarding age, as previously mentioned the highest prevalence of Internet addiction is among the younger population, in particular those aged 16–29 years (Bakken et al., 2009; Šmahel et al., 2009b).

Table 2: Review of surveys on the prevalence of Internet addiction

Survey (year of publication)	Location	Sample	Prevalence (%)
Morahan-Martin & Schumacker (2000)	US	227 college students Internet users	8.1
Chou & Hsiao (2000)	Taiwan	910 college students	5.9
Wang et al. (2003)	South Korea	Online, 13 588 respondents	3.5
Johansson & Gotestam (2004)	Norway	3237 respondents aged 12 – 18 years	2
Niemz et al. (2005)	UK	Online, 371 students	18
Aboujaoude et al. (2006)	US	2513 respondents aged 18 or over	0.3 – 0.7
Pallanti et al. (2006)	Italy	275 students	5.4
Cao & Su (2006)	China	2620 students aged 12 – 18 years	2.4
Zhang et al. (2008)	China	143 college students	14
	US	171 college students	4
Park et al. (2008)	South Korea	903 adolescents	10.7
Bakken et al. (2009)	Norway	3 399 respondents aged 16–74 years	1
Šmahel et al. (2009b)	Czech Republic	1 381 respondents aged over 12	3,4

2.2.4. Correlates of Internet Addiction

Results of research studies show that Internet addiction is accompanied by problems in other areas of the individual's life, such as study, work, relationships, health and also finance.

a) Study or occupational area

Students with high online addiction scores showed learning difficulties, resulting in poor grades, missed classes, and problems staying attentive during classes because of sleep deprivation (Chen & Peng, 2008; Douglas et al., 2008; Wainer et al., 2008). In the case of working people, Internet addiction occurred alongside lower efficiency, which in some cases resulted in job loss (Young, 1998a).

b) Relationships

Individuals with symptoms of Internet addiction frequently reported low self-esteem, social dependence, introversion, extreme shyness, low social skills, high sensation seeking, loneliness and social isolation (e.g. Chen & Peng, 2008; Davis, 2001; Lam et al., 2009; Mehroof & Griffiths, 2010; Morahan-Martin & Schumacker, 2000; Yang & Tung, 2007). Caplan (2003) and Liu & Kuo (2007) even suppose that low social skills play the main role in the genesis and maintenance of Internet addiction. Some surveys have confirmed that Internet addiction could have impact on relationships in that some individuals spend more time with online people, thereby resulting in impatience, arguments, and strain in their offline relationships (e.g. Lin & Tsai, 2002; Yang & Tung, 2007).

c) Mental and physical health

Chou (2001), in his online interview study with college students, reported that the major physical complaints stemming from students' Internet use were

eyesight deterioration and sleep deprivation. Among others, the college students mentioned sore shoulders, backs, hands and fingers, and fatigue. Suhail and Bargees (2006) focused on the effects of excessive Internet use in their study and found out that students most frequently mentioned physical problems such as migraine/headache, sleep disruption, and backaches because of Internet use. Christensen et al. (2001) adds to these negative consequences poor care of physical condition, such as eating irregularities and poor personal hygiene.

Studies focused on identifying psychiatric comorbidity of individuals with Internet addiction report high levels of anxiety, depression and frequent incidence of mood disorders, anxiety disorders, impulse control disorders, substance disorders, and attention-deficit/hyperactivity disorder (e.g. Black et al., 1999; Jang et al., 2008; Shapira et al., 2000; Yoo et al., 2004). Some researches alert that Internet addiction can be associated with cyber bullying (Ko et al., 2007), but also with other online risks, most typically with meeting strangers online, and less often with high sexual exposure (Šmahel & Blinka, 2011).

d) Financial situation

In the context of financial losses, perpetual computer upgrades and phone bills related to Internet service fees were often mentioned (Douglas et al., 2008; Young, 1998a). This is probably an older problem, prior to “flat rates” and permanent online connections becoming widely available. Financial problems can also be caused by job loss, as already pointed out.

2.2.5. Treatment of Internet addiction

With the increasing popularization of Internet addiction, especially in the USA, Korea and China, health professionals have begun to develop specialized treatment facilities for this target group (Block, 2008; Fackler, 2007; Huang et al., 2010; Ramson, 2007). Due to its relatively brief history, papers on Internet addiction treatment approaches are limited. The lack of evidence based treatment reports can be partly explained by the fact that an important characteristic of Internet addicts is strong denial of their addiction, which results in lower representations of this clientele in treatment, even though prevalence rates are fairly high (Young, 1998a).

Most authors (e.g. Christensen et al., 2001; Young, 1998a; Wieland, 2005) agree that a lifelong abstinence from Internet is not a treatment option, particularly because the Internet has become an indispensable part of modern life. Instead, it is recommended to focus on the controlled use of the Internet. The aim is rather to interrupt the problematic use of online applications while continuing to use necessary ones for everyday functioning, e.g. e-mail or information browsing (Kim, 2008; Young, 1998a).

In general there is an agreement that the main treatment approach should be psychosocial treatment, especially psychotherapy, which in more serious cases should be supplemented by pharmacotherapy. In treatment of Internet addiction, as is the case in other mental disorders, many psychotherapeutic approaches can be used, each of them stresses different aspects of the problem. This field is represented by two researchers: 1) Young (1998a, b, 1999, 2007) who published several papers describing cognitive-behavioural interventions with addicts and 2) Kim (2007, 2008) who based his work on the principles of reality

therapy. As well as these, there were also papers published presenting Naikan cognitive psychotherapy, motivation enhancement therapy and family therapy in the treatment of Internet addicts.

Cognitive behaviour therapy

Cognitive-behavioural therapy (CBT) views Internet addiction as a maladaptive cognitive coping style that can be modified by identifying the maladaptive thoughts, feelings, and behaviour, causing the person to inappropriately use the Internet to meet their needs (Hall & Parsons, 2001; Wieland, 2005). Young in her book "Caught in the net" (1998) recommends the following interventions, using elements cognitive behaviour approach, aimed at reducing Internet addiction: practice the opposite Internet usage patterns; set goals determining the exact number of hours per day to be spent online; use of external stoppers as prompts to help log off; abstinence from the specific Internet application to which one is addicted; using reminder cards with a list of the five major problems caused by Internet addiction, and the five major benefits of cutting down or abstaining from a particular online application; making a list of every activity or practice which the addict has cut down on because of time spent online.

In 2007, Young published a study examining the effect of the online CBT interventions of 114 Internet addicts. She concluded clients reported that CBT was effective at ameliorating the common symptoms of Internet addiction (motivation to quit, online time management, social isolation, sexual dysfunction, and abstinence from problematic online applications), upon a six-month follow-up most clients were able to maintain symptom management and continued recovery.

Reality therapy

Kim (2007; 2008) has published two papers describing a program for students with Internet addiction. The program is based on the principles of William Glasser's Reality Therapy which is widely used as a treatment for other addictive disorders. It is based on Choice Theory, which assumes that individuals are responsible for their own lives, for what they do, feel and think, and that those who display addictive behaviour should make the rational choice to achieve their wants. The program consists of 10 group sessions, each 60 to 90 minutes in length, in which the basic information about Internet addiction and the basic principles of Reality Therapy are explained. Results focused on the effectiveness of this program show that the program is able to reduce the level of Internet addiction while increasing self-esteem (Kim, 2008).

2.2.6. Future research directions

As Internet addiction is a fairly new phenomenon, with the first studies appearing in the late nineties, many questions remain unanswered, especially regarding clear terminology and diagnosis, prevalence and treatment. Future research should focus on clarifying the concept of Internet addiction, related terminology, and creating a standardized instrument for measuring Internet addiction. Future studies are also needed to establish and compare the prevalence rates of Internet addiction in the general population across different countries, and to find possible different patterns in the causes of Internet addiction in different countries. Attention should also be paid to the prevalence of Internet use, especially in individuals aged 50 and above. There is also a strong need for longitudinal studies on Internet addiction, which can reveal the causes

and impacts of the addiction, and also the stability or instability of Internet addiction over time. Little is known about the natural history of this behaviour, whether it is a chronic, waxes and wanes in severity, or remits spontaneously. Therefore follow up studies are necessary to track its emergence and determine its relationship to other disorders. In the clinical area the research should aim to clear up whether Internet addiction is a real clinical problem, to identify preventive measures, and find proven short and long term treatment strategies for Internet addicts. There is almost no information about treatment seeking behaviour, and how addicts who seek treatment differ from those who do not.

We can conclude that researchers have a long way to go in this area. More accurate definition and also diagnostic criteria are required, including research with longitudinal perspectives. But with new technologies developing so quickly, new technical tools can bring new challenges in this area. For example ten years ago nobody had heard of MMORPGs' games and now there is almost a new generation of players addicted to these games. New technologies can create new challenges for scientists.

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2.3. Prevention of addictive behavior on the Internet

2.3.1. Introduction

Although a large number of studies on addictive behaviour on the Internet and its treatment have been published, there are only few studies focusing on the prevention of addictive behaviour on the Internet and this area has only recently begun attracting the attention of researchers. Clinicians, educators, and policy makers agree that treatment strategies for tackling addictive behaviour on the Internet need to be accompanied with preventive strategies that address risk factors before addiction evolves into a more serious form (Kwon, 2011). This chapter presents current prevention efforts and future directions.

Kwon (2011) presents three reasons for putting high priority on developing prevention programs in this area. First, he states that most efforts to treat addictive behaviour on the Internet have been partially successful but it is very hard to motivate individuals with this problematic behaviour to seek out treatment due to the fact that they deny their problems. Second, there is limited treatment capacity and this can only offer treatment to a small part of those suffering from this form of addiction. Third, addictive behaviour on the Internet can eventually develop into a chronic form that is resistant to successful treatment and also has a high relapse rate.

Papers regarding the prevention of addictive behaviour on the Internet can be generally divided into three categories. Many of them just generally mention

in the discussion and/or the conclusion that there is a need for prevention of this problem. The papers in the second group mention that to prevent addictive behaviour on the Internet counsellors or educators should focus on Internet users with some specific conditions that are connected to or facilitate the development of addictive behaviour on the Internet. Some of them underscore the development of specific skills to prevent this type of addictive behaviour. The last and also the smallest category consists of papers which specifically focus on the prevention of addictive behavior on the Internet.

2.3.2. Targeting the vulnerable part of the population or specific skills

Majority of researchers agree on the fact that intervention programs should be developed to prevent addictive behaviour on the Internet among early adolescents, especially in elementary school settings that are often on the front lines of identification of potentially life-threatening behaviours (Jang & Ji, 2012; Lan & Lee, 2013). Therefore the majority of recommendations focus on adolescents of various ages, ranging from elementary schools to college students. Young (2010) on the other side stresses the possibility and importance of preventing addictive behaviour on the Internet at work. Some papers also mention that addictive behaviour on the Internet requires prevention and intervention when grouped with other problematic behaviour, usually drug use, since reductions of one behaviour may also facilitate reductions of the other (Gong et al., 2009; Ko et al., 2008). These recommendations reflect the current evidence based approach in prevention.

As was mentioned above, many of the papers which discuss prevention of addictive behaviour on the Internet on the basis of their research results specify the traits of the part of the population which is vulnerable to addictive behaviour on the Internet and/or recommend learning or acquiring specific skills to prevent addictive behaviour.

Vulnerable part of the population

One of the important ways to prevent addictive behaviour on the Internet is to detect earlier and treat/deal with risk factors which may trigger this form of addictive behaviour. The most frequently mentioned risk factors are loneliness, ADHD, hostility, stress, depression, anxiety and social phobia (Alavi et al., 2012; Ang, Chong, Chye, & Huan, 2012; Ko, Yen, Chen, Yeh, & Yen, 2009; M. P. Lin, Ko, & Wu, 2011; Oh, 2003; Yen et al., 2008), as well as hyperactivity-impulsivity (Wu et al., 2013), high novelty seeking and low reward dependence (Ko et al., 2006).

Specific skills

The researchers on the other hand agree that counsellors and educators should focus on developing specific skills among potential addicts and their families.

The developed specific skills for preventing addictive behaviour on the Internet in adolescents should include reduction of the positive outcome expectancy of Internet use, providing information on enhancement skills in refusal self-efficacy of Internet use (M. P. Lin, Ko, & Wu, 2008; M. P. Lin et al., 2011) and/or self-control in preventing addictive Internet use (Kim, Namkoong, Ku, & Kim, 2008), developing individual confrontative coping skills to reduce

stress and addictive behaviour on the Internet (Li, Wang, & Wang, 2009), improvement of capacity to regulate and process emotion (M. P. Lin et al., 2008, 2011), enhancement of self-esteem, diminution of hostility and interpersonal sensitivity (C. H. Ko, J. Y. Yen, C. F. Yen, H. C. Lin, & M. J. Yang, 2007), strengthening of social competence and ability to deal with stress and frustration, encouragement and empowerment of children to discover and experience self-efficacy, reinforcing the rules of fairness and tolerance within the class group in schools (Rehbein & Baier, 2013), attendance to the presence of maladaptive thoughts among online gamers (Peng & Liu, 2010), Internet use habits (Echeburúa & de Corral, 2010; Oh, 2003), the ability to communicate face to face and carry out group activities and free time activities (Echeburúa & de Corral, 2010) and motivating students to keep sleep schedule (Y. Lin & Gau, 2012).

Some researchers also mention family factors that influence addictive behaviour on the Internet and underscore working with parents including, e.g., promoting family functions (Echeburúa & de Corral, 2010; C.-H. Ko, J.-Y. Yen, C.-F. Yen, H.-C. Lin, & M.-J. Yang, 2007; Y. Lin & Gau, 2012) and especially parent-child communication, the amount of time spent with their children, understanding of their child's needs including Internet usage (Wu et al., 2013) and perceived knowledge and awareness of their children's online activities (Ang et al., 2012).

2.3.3. Preventive interventions

Literature dealing with preventive interventions for addictive behaviour on the Internet has identified two basic types of preventive programs or school interventions: programs providing knowledge and information and interactive

preventive programs. In international databases, the author found only two papers describing an evaluation of school interventions which focused on prevention of addictive behaviour on the Internet and one paper targeting the influence of six prevention factors on online gaming and addiction.

Providing Knowledge and Information

The most widespread form of prevention of addictive behaviour on the Internet is based on providing basic information regarding addictive behaviour on the Internet with an emphasis on factual information concerning its adverse consequences to parents and to adolescents (Alavi et al., 2012). Usually educators invite experts to give a presentation to students about addictive behaviour on the Internet and provide some advice on how to control Internet use. Kwon (2011) asserts that this approach had a certain intuitive and logical appeal in days when addictive behaviour on the Internet was a new phenomenon, but is not effective nowadays.

One example of this preventive approach is a study on the effects of peer-training of safe Internet use. Korkmaz and Kiran-Esen (2012) examined the effect of peer training of safe Internet use on 825 students enrolled at two elementary schools in Turkey using a control and an experimental group. The peer educator group underwent a 10-session peer education program and informed their peer in two 40-minute sessions focused on the nature of Internet and addictive behaviour on the Internet, types of online activities and safety programs. The results showed that the peer training was beneficial to the students who underwent the training as their Internet use was affected in a positive way.

Although the aforementioned program proved to be effective, the evidence-based recommendations in prevention assert that merely providing information about extreme negative consequences of problem behaviour was shown to be ineffective in school-based drug prevention programs and need to be delivered with interactive interventions targeting attitudes and life skills (Cuijpers, 2002; Soole, Mazerolle, & Rombouts, 2008).

Interactive preventive programs

The author found only a single study presenting the results of a multi-behavioural health-promoting school pilot intervention in Dutch secondary schools (Busch, De Leeuw, & Schrijvers, 2013). The authors of that study collected data via an annual online questionnaire from 336 students (15- to 16-year-olds) who completed 3-year curriculum cycle. The program promoted healthy behaviour in 9 aspects (healthy nutrition, physical exercise, sexual health, reducing alcohol and drug use, smoking, bullying, excessive sedentary behaviours (watching TV, computer use) and gaming and excessive compulsive behaviour related to Internet use and gaming). The whole school approach model is based on applying a healthy school policy, involving the out-of-school environment to focus on personal skill development. The intervention successfully changed student health behaviour on many accounts (smoking, extreme alcohol use, sedentary time and bullying behaviours) but no changes were reported regarding the compulsiveness of video game playing.

Impact of preventive factors

Xu, Turel, and Yuan (2012) did not evaluate any concrete intervention but monitored the impact of six prevention factors (attention switching to other meaningful activities, perceived financial cost of the gaming that inhibit online

gaming and addiction, dissuasion by others, rationalization/education, parental monitoring and resources such as money, equipment, regulation and restriction) on game playing and addiction from the self-reports of 623 adolescents in China. The data suggest that attention switching had significant negative impact on game playing and addiction. Rationalization/education and perceived cost had significant influence on game playing but not on online game addiction and parental monitoring had a negative influence on online game addiction. Surprisingly the adolescents reported that dissuasion was positively associated with game playing and addiction, and resources were positively correlated with online game addiction.

2.3.4. Future directions in prevention

In the area of addictive behaviour on the Internet we can find initial attempts to focus on prevention. Whereas there are some general and specific recommendations for prevention of addictive behaviour on the Internet in the literature especially regarding indicative prevention, there is only a limited number of papers presenting specific preventive interventions in this area. On the basis of some researchers (Gong et al., 2009; Ko et al., 2008) and actual evidence-based approach in prevention (Miovsky, Stastna, Gabrhelik, & Jurystova, 2011; Širůčková, Miovský, & Skácelová, 2012), there is no need to create specific preventive interventions focused on addictive behaviour on the Internet. Rather it seems reasonable that addictive behaviour on the Internet should be prevented and intervened when grouped with other problematic behaviour, as in the case of aforementioned multi-behavioural health promoting school intervention in Dutch secondary schools (Busch et al., 2013). Therefore the future efforts in this area should focus on developing broader multimodal

programs that would address the risk factors that are common to many youth problems or maybe just on enriching already existing programs by adding a focus on addictive behaviour on the Internet and its evaluation.

Two previously mentioned interventions fall within the area of universal prevention. The author didn't find in databases any selective or indicative prevention interventions that would target addictive behaviour on the Internet. Kwon (2011) mentions two programs for young heavy or compulsive users of the Internet. But these work with clients who are already addicted and therefore don't fulfil the criteria of selective or indicative prevention. On the other hand, as was mentioned in chapter two, many papers regarding prevention of addictive behaviour on the Internet mention the importance of working with the vulnerable part of the population. Therefore it could be recommended to focus future prevention efforts in this area on the development and evaluation of selective or indication prevention interventions or application of already developed interventions for other problem behaviours and their evaluation in the area of addictive behaviour on the Internet.

The literature mentioned that some specific parental skills can prevent addictive behavior on the Internet, but no paper reported a parental training program. Therefore the last recommendation would be to focus the attention of educators and counsellors also on developing such a parental training program and its evaluation.

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3. Comparing Addictive Behaviour on the Internet in the Czech Republic, Chile and Sweden

This part is based on the paper: Šmahel, D., Vondráčková, P., Blinka, L., & Godoy-Etcheverry, S. (2009). Comparing Addictive Behaviour on the Internet in the Czech Republic, Chile and Sweden. In: G. Cardoso, A. Cheong, J. Cole. World Wide Internet: Changing Societies, Economies and Cultures (pp. 544-582). Macao: University of Macau. The theoretical background from this paper was removed, because it partly overlaps with the previous paper.

3.1. Introduction

Many reports of addictive behaviour on the Internet first appeared in popular press citing anecdotal evidence (Rheingold, 1993; O'Neill, 1995). The phenomenon of addictive behaviour was mentioned in the clinical context for the first time by American clinical psychologist Kimberly Young in 1996 (Young, 1998a). From that time on, many experts, particularly in the U.S. (e.g. Scherer, 1997; Suler, 1999; Beard, 2005) and Asian countries like Taiwan and South Korea (e.g. Chou et al., 2005; Chen & Hsiao, 2000; Kim et al., 2008), have been focusing their attention on this topic. Until today there remain many unanswered questions regarding this phenomenon- the concept of addictive behaviour on the Internet has not been fully developed, and perhaps is still in its infancy (Yang & Tung, 2007). The open question persists as to whether addictive behaviour on

the Internet is a disorder itself or whether it is a manifestation of another mental disorder (Grohol, 2005; Mitchell, 2000; Yang & Tung, 2007). In fact, it has been proved by many experts that excessive Internet use can negatively affect an individual's life and result in physical, psychological and other problems (Morahan-Martin & Schumacher, 2003; Young, 2007). After a series of 10 pulmonary-related deaths in Internet cafés and a murder related to online games, South Korea has come to even regard addictive behaviour on the Internet as one of their most serious public health issues (Block, 2008). China is also greatly concerned about this type of addictive behaviour, which has resulted in the ratification of a law which discourages more than 3 hours of daily computer game use ("The more they play, the more they lose", 2007).

The issue of addictive behaviour on the Internet is also new within the World Internet Project, the first questions (on this topic) having been asked in the Czech Republic in 2007. This article reports on the results of a second questionnaire from 2008. The purpose here is to present a comparison of two symptoms of addictive behaviour on the Internet in the countries of Sweden, Chile and the Czech Republic. These two symptoms are conflict (when the Internet causes serious problems for individuals) and mood change (when usage of the Internet leads to significant mood changes). The second task is to show the current prevalence of addictive behaviour on the Internet in the Czech Republic. This was assessed based on the general symptoms for addictive behaviour which are described in the Diagnostic and Statistical Manual of Mental Disorders (DSM- IV revision), adjusted for the specifics of the Internet environment.

3.2. Country profiles

To give the reader a basic overview of the countries in the form of a presented comparison, we show a table of country profiles. See Table 2:

Table 2: Country profiles of three countries for comparison

	Chile ²	Czech Republic	Sweden
Land Area	756,096 sq km ²	77,276 sq km ²	450,295 sq km ³
Population	15,116,435	10,235,455	9,259,828 ⁴
Density per sq km	19,9	132,4	22,4
GDP Growth rate	3,2% ⁵	-0.1%	-4,9% ⁶
Ethnicity/race	Original ethnic groups (Mapuche, Rapa nui, Aimara, other): 4.6% Mixed, European: 95.4%	Czech 90.4%, Moravian 3.7%, Slovak 1.9%, other 4%	Not defined for Sweden ⁷
GDP per capita	\$12,997	\$18,100	\$37,526 ⁸

Sweden is a rich Scandinavian country traditionally open to new technologies. The Internet first appeared in the beginning of the 1990s. The

² Sources for Chile: National Statistical Institute (www.ine.cl), based on the 2002 census. Economic data from Banco Central de Chile, UNDP, America Economia. Geographical information excludes the Antarctic territory (1,250,000 sq km). GNP per capita figures at 2006 purchasing power parity values.

³ www.norden.org

⁴ www.scb.se (31 January 2009)

⁵ GDP growth 2008.

⁶ www.scb.se (quarter 4 2007 – quarter 4 2008)

⁷ Ethnicity is not defined in the statistics on Sweden. While there are statistics on how many people are born outside of Sweden, ethnicity is difficult to define. The minority group in Sweden is the Sami people - the native people of Sweden. There are about 17 000 Sami people in Sweden.

⁸ www.sv.wikipedia.org; www.riksbank.com (1 USD = 6,4173 SEK (January 2008) 1 USD = 8,1064 SEK (January 2009))

fastest growth of Internet users was in 1998 and reached 50% in terms of Internet penetration in the population in 2000.

The Czech Republic is a post-communist country which reached independence in 1989. In the 1990s, the Internet was restricted to academic use and computer related industry. In 2000, only 10% of the population used the Internet, followed by very fast growth in the following years. 50% of the population was connected in 2005.

Chile is a developed South American country where 40% of the population live in the capital Santiago de Chile. The number of Internet users is growing slowly every year, e.g. in 2000, 26% of the population used the Internet, while in 2008 that figure was 48%.

3.3. Methods

The survey was part of the World Internet Project (WIP), organized by the Center for the Digital Future at USC Annenberg in the U.S. and comparing over 20 countries. The data were obtained in 2008 via face-to-face interviews from Chile and the Czech Republic and via telephone interviews and Internet surveys in Sweden, in which the interviewers marked their answers on a prepared questionnaire. The basic set of WIP questions was supplemented with questions related to addictive behaviour on the Internet. The data analyzed in this paper were collected and are owned by the following institutes:

(1) Chile: The survey was executed by Universidad Catolica de Chile's Division of Sociological Studies (DESUC) by request from the WIP/BIT-Chile team (composed of the schools of Communications, Sociology and Engineering).

(2) Czech Republic: Institute of Children, Youth and Family Research, Faculty of Social Studies, Masaryk University, Brno.

(3) Sweden: World Internet Institute.

We developed a 10 item scale (see table 3) evaluating the following dimensions of excessive Internet use: cognitive and behavioural salience, tolerance, withdrawal symptoms, conflicts, and problems with limiting time online. Our scale is based mainly on the research of Beard and Wolf (2001), who have modified DSM- IV criteria for Internet use, and from Griffiths (1996, 2000), who has defined the basic dimensions of addictive behaviour on the Internet. All of the 6 criteria were included with two small changes - withdrawal symptoms fell within mood modifications (3rd question) and relapse within time restrictions (9th question). This instrument measured addictive behaviour on the Internet on a 4-point Likert scale (1- *Never* to 4- *Very often*).

Table 3: Factors of addictive behaviour on the Internet

Salience	Do you ever neglect your needs (like eating, sleeping) because of the Internet?
	Do you ever imagine you are online when you are not?
Mood modification	Do you feel unsettled or irritated when you cannot be online?
	Do you feel happier and more cheerful when you finally get to go online?
Tolerance	Do you feel like you are spending ever more time online?
	Do you ever catch yourself surfing without being really interested?
Conflicts	Do you ever argue with your close ones (family, friends, partners) because of the time you spend online?
	Do your family, friends, job or hobbies suffer because of the time you spend online?
Time restrictions	Have you ever tried unsuccessfully to limit time spent online?
	Does it happen to you that you stay online for a longer time than originally planned?

All 10 questions were used only in the Czech Republic, and we demonstrate the use of the whole instrument in Chapter 6 "Revealing dimensions of addictive behaviour on the Internet: the Czech Republic". Six questions were used in Chile and only two of these items were used in Sweden. All three countries have two common questions, one question on conflict dimension and one question on mood modification. Because we wanted to compare all three countries, the relevant results are given in Chapter 5 "Two dimensions of addictive behaviour on the Internet: comparing Chile, the Czech Republic and Sweden".

3.4. Sample description

Samples of comparison data among the Czech Republic, Chile and Sweden

We present data on population samples aged 16 and up; samples in Sweden and the Czech Republic are representative for each country. For Chile, the sample represents the population of the capital, Santiago (5.8 million inhabitants, 38% of the country's population), aged 12 to 60 years. The following table shows more information about each of the presented data samples:

Table 4: Basic information about sample and data collection in the three countries

Country	Number of all respondents aged 16+	Data collection	Method	Representativity
Chile	592	September -November 2008	Face- to- face interviews, probabilistic	Representative for: sex, education, age, income level, and the size of the respondent's domicile in Santiago.
Czech Republic	1381	September 2008	Face- to -face interviews	Representative for: sex, education, age, region, and the size of the respondent's domicile
Sweden	2057	February- April 2008	Telephone interviews and Internet surveys	Representative for: sex, age, education, region and the size of the respondent's domicile

Table 5 shows the numbers of respondents in three samples concerning gender and age.

Table 5: Sample description

	All 16+ years (N)	Males (N)	Females (N)	16 - 19 years (N)	20 - 29 years (N)	30 - 45 years (N)	46 and older (N)
Chile	592	237	355	87	140	179	186
Czech Republic	1381	669	711	125	204	389	663
Sweden	2057	1011	1046	150	325	577	1005

Age groups reflect the following developmental stages of life: 16 – 19 years-adolescents, 20 – 29 years-young adults, 30 – 45 years-middle adulthood, 46 and older- middle and late adulthood. We could not create a group of older respondents (such as 60 and older) because there are not enough Internet users in the Czech Republic and Chile.

Table 6 presents percentages of Internet users in the relevant groups of samples.

Table 6: Percentages of Internet users in the relevant sample groups

	All 16+ years (%)	Males (%)	Females (%)	16 - 19 years (%)	20 - 29 years (%)	30 - 45 years (%)	46 and older (%)
Chile	63.5%	75.1%	55.8%	87.4%	87.9%	60.9%	36.6%
Czech Republic	52.4%	53.1%	51.8%	89.6%	72.1%	67.4%	30.5%
Sweden	80.2%	82.3%	78.2%	97.3%	96.3%	92.7%	65.3%

While the shares of Internet users in Chile and in the Czech Republic regarding age are similar, in Sweden there are much higher shares of Internet users in all age categories. One interpretation of this difference could be the slowed digital development in Chile and the Czech Republic, explained by the overall degree of socio-economic development measured in terms of income per capita. By this measure, the Czech Republic and Chile are more similar to each other than Czechs and Swedes, despite these two being European countries.

In Table 7, we present the average hours spent weekly online at home on a wired computer in relevant groups. We show only the average hours weekly at

home (not hours from work or school) because home Internet use seems to be the most important in the context of addictive behaviour: the highest correlations exist between hours at home spent weekly online and items on addictive behaviour. There are no significant correlations between hours at work and questions on addictive behaviour. The data from the table indicate that Czechs, as compared to Swedes and Chileans, spend significantly less time weekly at home online.

Table 7: Average hours spent weekly online at home on wired computer

	All 16+ years (hours)	Males (hours)	Females (hours)	16 - 19 years (hours)	20 - 29 years (hours)	30 - 45 years (hours)	46 and older (hours)
Chile	10.0	10.7	9.3	12.7	11.5	8.0	7.2
Czech Republic	7.4	8.1	6.7	11.2	9.5	6.2	5.4
Sweden	10.2	11.2	9.1	15.6	15.5	9.8	6.7

Sample of addictive behaviour prevalence in the Czech Republic

In the case of the Czech Republic only, all together 1520 respondents took part in the study, all aged 12 or over (1381 aged 16 and older). The used sample was representative of the Czech population with respect to gender, age, education, region and place of residence. Additionally, data on 695 respondents aged 12-30 were gathered later, and this sample was also representative with respect to this age group. Overall, the study was comprised of 2215 respondents. However, data on addiction were only extracted from Internet users in the sample (N=1470). We present data on prevalence of addictive

behaviour in the Czech Republic on this full sample of 2215 respondents because we want to point out an important difference in the group 12 to 15 years and also show the most accurate results.

3.5. Two dimensions of addictive behaviour on the Internet: comparing Chile, the Czech Republic and Sweden

As stated previously, we will examine results on two dimensions of addictive behaviour on the Internet- conflict and mood change.

Conflict dimension

The conflict dimension was measured by the question *“Do you ever argue with your close ones (family, friends, partners) because of the time you spend online?”* In Table 8 percentages of individual responses according to country are given.

Table 8: Do you ever argue with your close ones (family, friends, partners) because of the time you spend online?

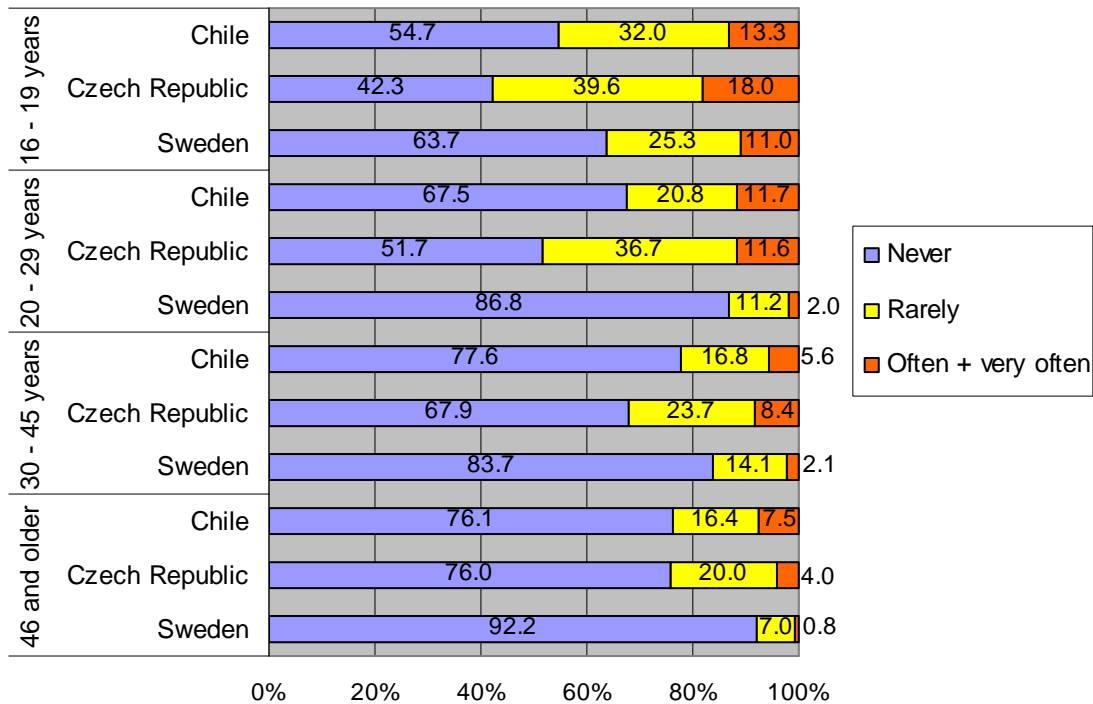
	Never	Rarely	Often	Very often	
Chile	69.4%	21.1%	7.9%	1.6%	100.0%
Czech Republic	62.9%	27.8%	6.8%	2.5%	100.0%
Sweden	85.8%	11.8%	1.9%	0.5%	100.0%

It can be seen that the conflict caused by Internet use is lowest in Sweden – about 10% of Czech or Chile Internet users experience conflict “often” or “very

often” as opposed to only 2.4% of Internet users in Sweden. What could the reason be for such a difference? If we look at Swedish shares of Internet users, they are much higher than in the Czech Republic and Chile; it may be that the Swedish sample of Internet users contains more “low Internet users” because there is a higher share of older and also low- educated people. This difference could cause the lower answer regarding the experiences of low conflict among Swedes. If we look at average hours spent on the Internet among age categories (Table 7), however, Swedes are the greatest Internet users in all age categories except the oldest one. Furthermore, when we tested answers on relevant questions only for heavy Internet users, Swedes again reported a lower experience of conflict and also mood change (see the next chapter).

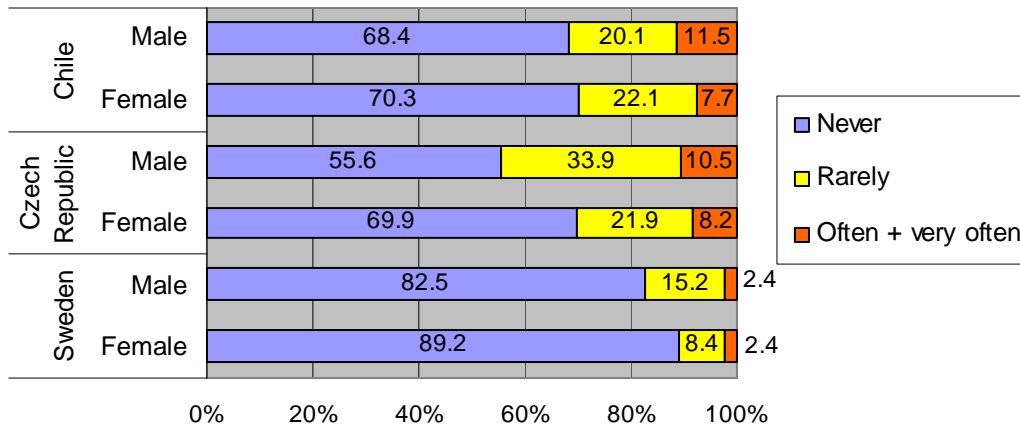
Graph 1 depicts conflict with family, friends or partners according to age. Differences between countries are not significant only in the age group of

Graph 1: Conflict with family, friends or partners according to age



adolescents ($p = 0.61$), but differences in other age groups are also significant ($p < 0.001$). Graph 2 gives a picture of the distribution of conflict with family, friends or partners according to the gender of respondent. Male versus female difference is not significant, only in Chile, which is interesting because the biggest gender gap in Internet use is found in this country. But the main gender differences in the Czech Republic and Sweden are in the answer "rarely", which is not usually considered as problematic with relation to addictive behaviour. Country differences are significant in all cases – Swedish men and women reported experiencing less conflict than other countries.

Graph 2: Conflict with family, friends or partners according to gender



Mood change dimension

The dimension of mood change was measured by the question *Do you feel unsettled or irritated when you cannot be online?* Table 9 shows the percents of responses in three presented countries. We can notice again that Internet users in Sweden reported feeling unsettled or irritated much less than respondents in the Czech Republic and Chile.

Table 9: Do you feel unsettled or irritated when you cannot be online?

	Never	Rarely	Often	Very often	
Chile	60.9%	22.1%	11.3%	5.7%	100.0%
Czech Republic	64.4%	27.5%	6.4%	1.7%	100.0%
Sweden	86.3%	11.7%	1.7%	.2%	100.0%

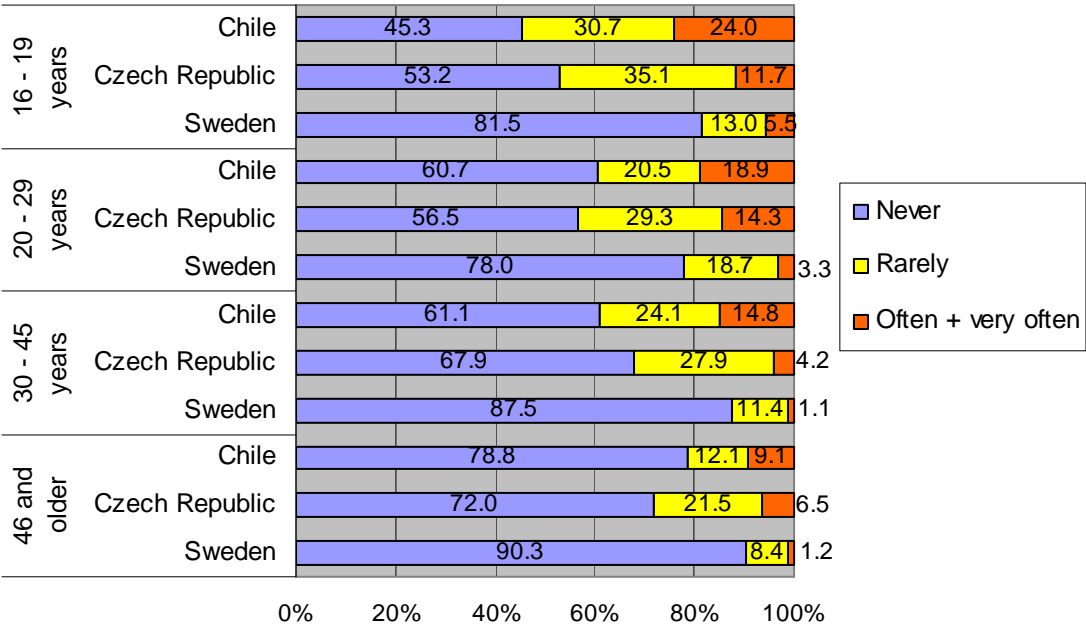
Graph 3 displays mood change according to age. All differences in terms of age among countries are significant. Congruently, with the results in the previous

dimension, in comparison to other countries, Swedes feel less unsettled or irritated when they cannot be online.

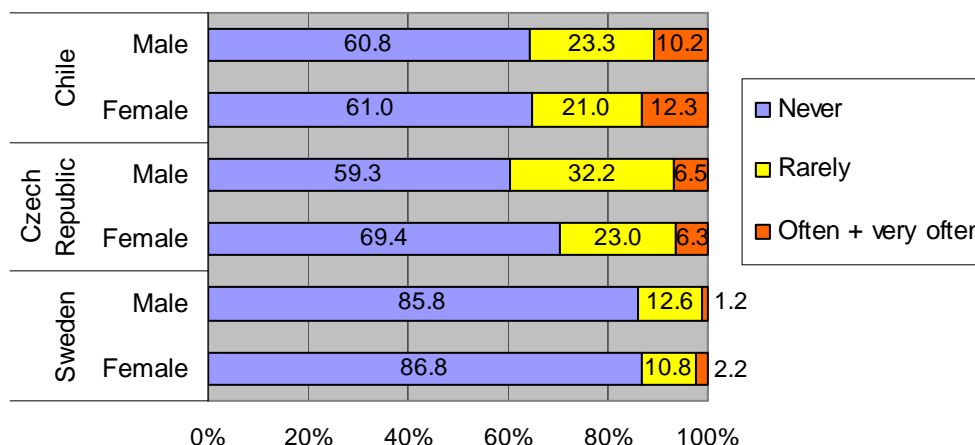
Graph 4 illustrates the distribution of mood change according to gender. Gender differences are significant only in the Czech Republic ($p = 0.036$). We can observe that gender differences are lower here than in the case of conflict.

Now we will look more closely at possible reasons for Swedes scoring lower than the other two countries in the dimensions of conflict and mood change. We will also present the possible risky applications that exist in the context of addictive behaviour on the Internet.

Graph 3: Do you feel unsettled or irritated when you cannot be online according to age



Graph 4: Do you feel unsettled or irritated when you cannot be online according to gender



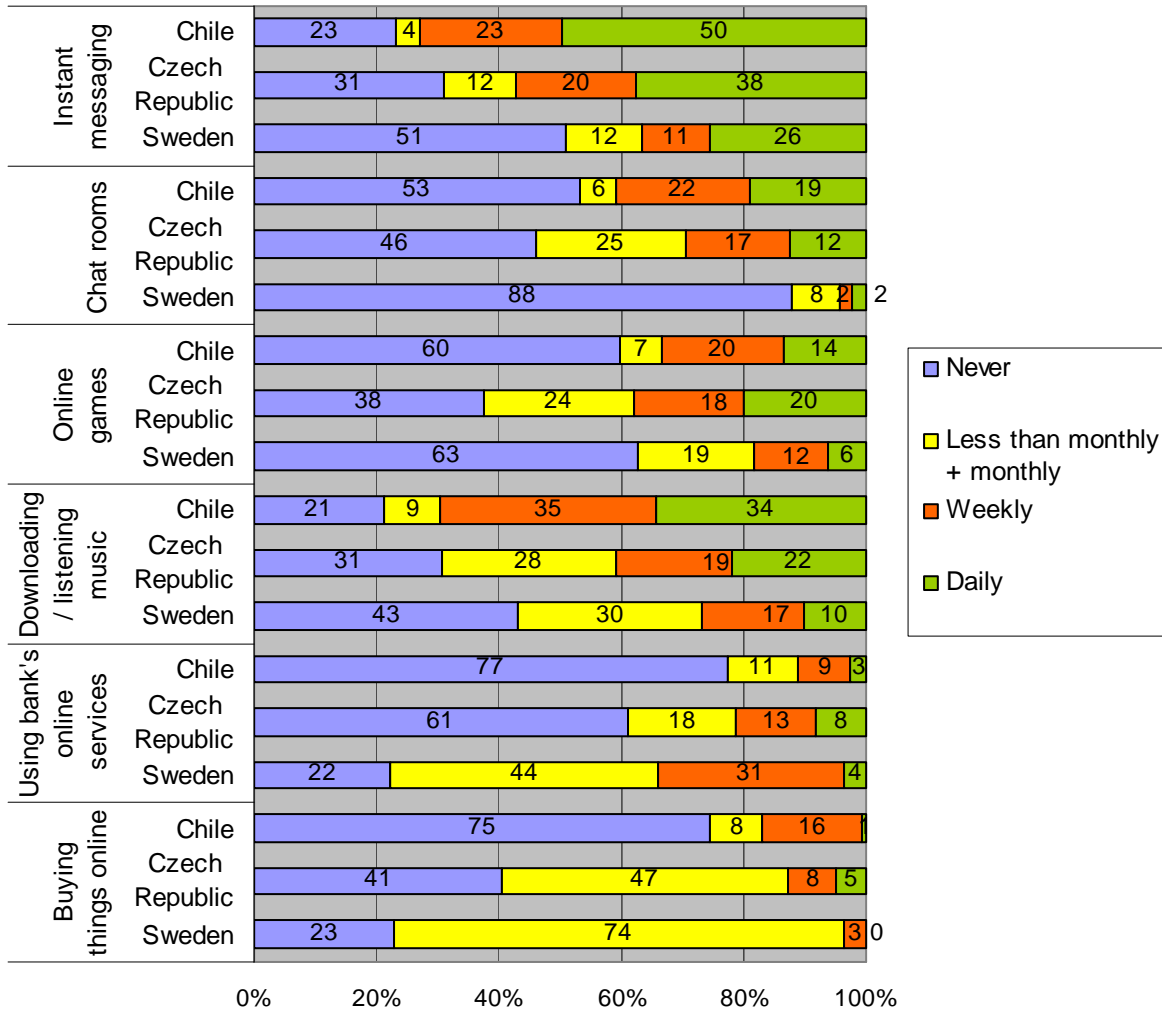
Dangerous activities online

We further analyzed which activities on the Internet show the highest correlations with the sum of the presented two questions – this sum can be perceived as a simple addiction score. The highest (Pearson) correlations with the addiction score were found in the following activities on the Internet: chat rooms ($r = 0.18$ in Chile, $r = 0.35$ in Czech, $r = 0.22$ in Sweden), instant messaging (r from 0.19 to 0.25) and online games ($r = 0.35$ in Chile, $r = 0.34$ in Czech, $r = 0.22$ in Sweden). These results correspond to theoretical assumptions that online addiction is mainly created in environments for communication and also in online games (Tsai & Lin, 2003; Young, 1996b). Two surprising activities with high correlations with online addiction were in all three countries: “downloading / listening music” and “downloading / watching videos” (r from 0.22 to 0.30). Both activities show similar results in all three countries and it is a question for future research and analysis what causes one of the highest correlations between downloading music and video and proneness to addictive

behaviour. These connections have been previously demonstrated in our earlier research (Smahel et al., 2009) and are now validated in the three- country comparison. It should also be noted that the correlations between online activities and addiction scores were similar in all three countries – therefore, it cannot be said that one country differs much from the others. We can say that addictive behaviour on the Internet is very likely bound to similar behaviour and use of applications on the Internet in different countries.

In Graph 5, we show frequencies of use for the most “addictive” applications and two “practical” applications on the Internet in our three countries. We can see that all four applications which show the highest correlations with the score of addictive behaviour are least used in Sweden. Fifty percent of Swedes reported not instant messaging, 88% neither visiting chat rooms, and 63% claimed not to play online games etc. It is probable that the lowest scores among Swedes in the dimensions of online addictive behaviour are influenced by very low use of “addictive applications”. On the other hand, two practical online activities- using online banking services and buying things online- are most used in Sweden. It seems that Swedes tend to access the Internet more for daily life and less for entertainment. Nevertheless, such hypotheses should be confirmed in more detailed analyses of patterns of Internet use in the three countries, which goes beyond the scope of our article.

Graph 5: Dangerous and practical activities online in compared countries

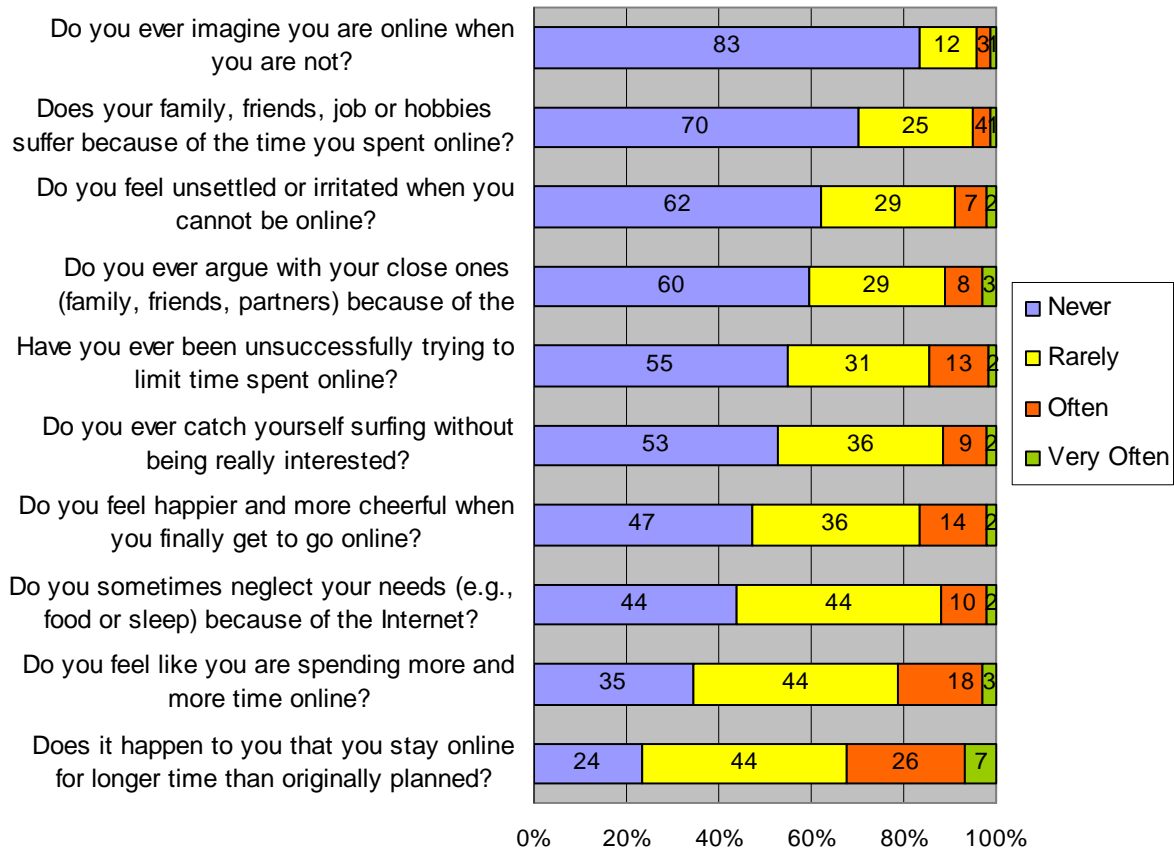


3.6. Revealing dimensions of addictive behaviour on the Internet: the Czech Republic

In this chapter, we will additionally show the prevalence of addictive behaviour on the Internet in the Czech Republic. First, we introduce in Graph 6 the frequencies of the 10 questions which were used for describing the

phenomenon. At the top of the graph are less often affirmatively answered questions and at the bottom, the most often.

Graph 6: Frequencies of items on addictive behavior on the Internet

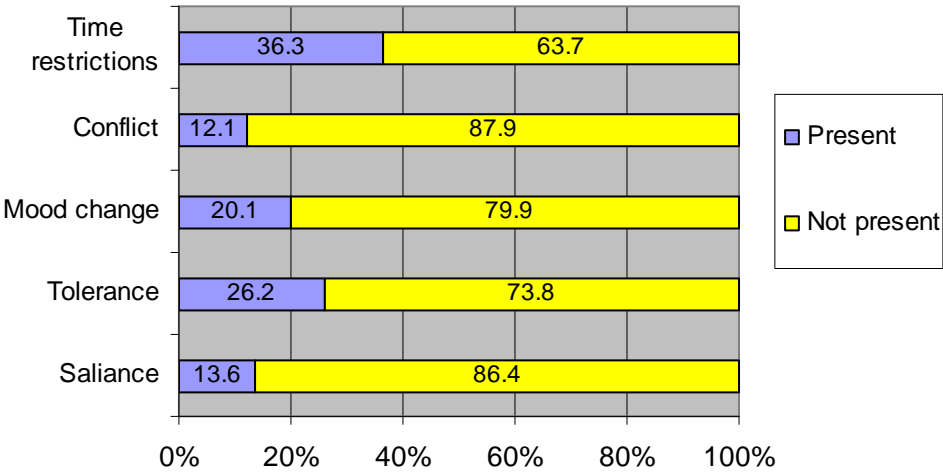


Most Czech Internet users agreed that they stay online more often than they had originally intended (in sum 33% answered “often” or “very often”). About 16% of Internet users agreed that they “often” or “very often” feel happier and more cheerful when they get online. On the other hand, only 4% stated that they “often” or “very often” imagine they are online and 5% agreed that their family, friends or jobs suffer because of time spent online.

Graph 7 shows the prevalence of 5 dimensions representing addictive behaviour on the Internet. Already described in chapter 3 are the “Measures”, which show

where the ten questions lie within the five dimensions. The dimension is comprehended as present if the Internet user answered “often” or “very often” for at least one question in the dimension.

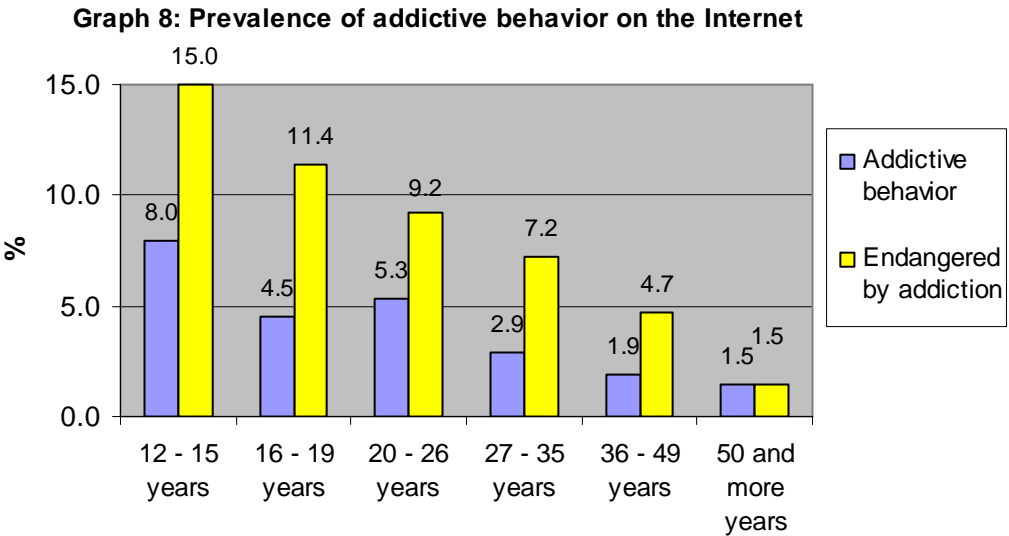
Graph 7: Prevalence of dimensions of addictive behavior on the Internet



The most often present dimension is “time restriction”, which probably least represents the phenomenon of addictive behaviour on the Internet. As we saw in the previous graph, every third Internet user agreed that he or she has “often” stayed on the Internet longer than originally intended. High prevalence is also in the dimension “tolerance” because a very large percent of Internet users stated that they spend more and more time online. The least present dimension is “conflict” – 12% of Internet users experience conflicts with their close social environment due to the use of the Internet. However, as Beard and Wolf (2001) also stated, conflict is probably the most important dimension of addictive behaviour on the Internet.

Now, we will describe the prevalence of addictive behaviour on the Internet in the Czech Republic. We label an Internet user as exhibiting “addictive behaviour” if all dimensions of online addiction are present (the Internet user scored high in all 5 dimensions). We label Internet users as “endangered by addictive behaviour” if conflict plus at least three dimensions are present (that means that one dimension, excluding conflict, can be missing). The prevalence of addictive behaviour on the Internet among Czech Internet users is 3.4% - this percentage of users scored in all dimensions of addictive behaviour. In addition, 7.1% of Internet users are endangered by online addictive behaviour as they scored high in conflict and in at least three dimensions. The differences between men and women in percentages of users with a tendency towards addictive behaviour on the Internet and percentages of endangered users are not significant.

In Graph 8, we present percents of Internet users with “addictive behaviour” and groups “endangered by addictive behaviour” according to age.



Younger adolescents aged 12 to 15 years compose the biggest group of users with addictive behaviour, with 8% of younger adolescents demonstrating all symptoms of addictive behaviour. Additionally, 15% in this youngest group are endangered by addiction due to scoring high in conflict plus at least three other dimensions. The shares of Internet users with a proneness to addictive behaviour on the Internet are lower in older groups, with between 4.5 to 5.3% users showing all symptoms of addictive behaviour for groups between 16 and 26 years and the figure decreases with the age. Least prone to addictive behaviour on the Internet are the oldest age group, 50 years and older.

3.7. Discussion and Conclusions

The current study sought to investigate the incidence of two dimensions of addictive behaviour on the Internet (conflict and mood change) among the general population of Chile, Czech Republic and Sweden and to examine the prevalence of addictive behaviour on the Internet on a sample of the Czech population.

When comparing these dimensions of addictive behaviour on the Internet in Chile, the Czech Republic and Sweden, we came across an interesting finding, that the answers of respondents on two questions concerning conflict and mood change were similar in the Czech Republic and Chile but different in Sweden, as well as that Swedes showed a lower incidence of dangerous activities online. What could the explanation be? We found that certain Internet applications are associated with the symptoms of addictive behaviour – there are moderate correlations between the symptoms and frequency of visiting chat rooms, playing

online games, using IM and downloading music and videos. Internet users in Sweden access these risky activities (with respect to addictive behaviour) less often in comparison with those users in Chile and the Czech Republic. At the same time, the Internet in Sweden is used for more common purposes like Internet banking, shopping, and making reservations. Therefore, we can suppose that Internet usage has become an integral part of life in general, while in Chile and the Czech Republic this is not the case, partly due to the slower digital development of these countries. This could be partially explained by the lower degree of socio-economic development in these two countries in comparison to Sweden. The share of Internet users is lower (52.4% in the Czech Republic, 63.5% in Chile for the population 16 years and older), and the Internet is used more by younger individuals within the age group 16 – 29 years. Youngsters are generally more attracted to risky activities (e.g. chatrooms, online gaming) and therefore are generally more susceptible to addictive behaviour on the Internet (Bakken et al., 2009; Cao & Su, 2006). Furthermore, we can speculate that the rest of adult Internet users in Chile and the Czech Republic are more likely to be fans of Internet use and thus are endangered by addictive behaviour on the Internet as well, in comparison to Swede Internet users. The other hardly verifiable explanation of this fact is cultural difference, particularly the mentality of each nation, which differs in all three countries because of geographic location, different cultural traditions and cultural norms. Unfortunately, this explanation is beyond the focus of the presented study and would need further research.

The differences in results regarding conflict dimensions between females and males in the case of the Czech Republic and Sweden are significant and slightly higher in favor of males. This distinction could be explained by the

assumption that men have a higher proclivity towards conflicts in general and therefore they score higher (e.g. Noakes & Rinaldi, 2006). On the other hand, it is also possible that men are more often endangered by addictive behaviour on the Internet as they spend more hours in front of computers and therefore have more conflicts with their families or partners. It is also a question for further research to distinguish both aspects of conflict dimension.

Regarding age differences in the case of all three countries, the results in both dimensions correlate negatively with the age. The highest scoring respondents were aged 16 to 19 years and the ones aged 46 and older showed the lowest score. When we suppose that scores in these two dimensions correlate with addictive behaviour on the Internet, these findings confirm the results from previous research in that the highest prevalence of addictive behaviour on the Internet is among the younger population (Soule et al., 2003; Widyanto & Griffiths, 2006; Bakken et al., 2009). When compared with the dimension of mood change, the conflict dimension score is slightly increased in the Czech Republic and Sweden for respondents aged 16-19 years. This could be partly due to the fact that a higher tendency towards conflict behaviour is an integral part of the adolescent period (Macek, 2003). It has been also reported that the presence of computers in families increases family tensions between generations (Mesch 2006 a,b), so the conflict criterion might be overestimated and is not necessarily indicative of addictive behaviour. We can also speculate that conflict between adolescents and parents is in general higher in modern Euro-American culture than in more traditional cultures such as Latin American.

The findings in the Czech Republic showed that only 43% of the population 12 years and older did not use the Internet (in September 2008), 3.7% of

Internet users were at risk for addictive behaviour on the Internet and a total of 3.4% could be described as having developed addictive behaviour, giving a total of 7.1%- a quite high number of risky Internet users. In comparison to other surveys (see table 1), the prevalence of addictive behaviour on the Internet in the Czech Republic in the general population is somewhat higher. This may be due to the methodological inconsistency of the definition and the criteria used to measure addictive behaviour on the Internet, which is typical for this phenomenon as was mentioned in the theoretical background (Yang & Tung, 2007). International research on common questions of addictive behaviour on the Internet is needed and the World Internet Project could be such an opportunity to evaluate and compare this phenomenon worldwide.

As we have mentioned in the theoretical background, the highest prevalence of addictive behaviour on the Internet is among the younger population, particularly students (Soule et al., 2003; Widyanto & Griffiths, 2006; Bakken et al., 2009) and findings from this study confirm this. In our research, the lowest age group, which included young adolescents aged 12 – 15 years, showed the highest incidence of Internet users endangered by addictive behaviour (7%) as well as of individuals with developed addictive behaviour on the Internet (8%). In contrast, the prevalence of addictive behaviour in the oldest group in this research (respondents aged 50 or over) was lowest (1.4%). This confirms our previous finding that addictive behaviour on the Internet is negatively correlated with age. The question remains as to what the results for even the younger individuals would be. The higher incidence of addictive behaviour on the Internet in the adolescent group can be explained by the fact that they belong to the first generations which experienced the boom of the

Internet, along with the greater availability the development of applications with addictive potential (e.g. chat rooms, downloading, online games) and social networking sites which are used mainly by this age group. The attraction of the above mentioned applications for this age group can be partly explained by the adolescent developmental period. This period is typified by the search and formation of a new identity (Erickson, 2002) separate from family, and the creation of interpersonal relationships and the first romantic and sexual relationships. For example, using chat rooms and instant messaging allows users to create interpersonal and sexual relationships with their peers and therefore facilitate the process of separation from family, particularly from parents. On the other hand, the higher prevalence figure could have been distorted by the fact that conflict, particularly with parents, is an integral part of this developmental stage (Macek, 2003) and that using computers in families leads to more parent-child conflicts in general (Mesch, 2006a,b), as already touched upon. A special questionnaire distinguishing the type of conflict should be developed for adolescents in future research.

This study has focused on the prevalence of conflict and mood change dimensions of addictive behaviour on the Internet in the Chile, Czech Republic and Sweden. Several limitations should be considered in this study: first, we compared only two questions of two dimensions, which cannot provide the entire picture of addictive behaviour prevalence in all three countries. In future research, utilization of all questions would provide more information concerning this topic. Such data would be the first to provide comparable data on general populations across more countries considering the fact that it is very difficult to compare results of already carried-out prevalence studies due to inconsistent

methodology. Second, the questionnaire we used has not been standardized and furthermore, the phenomenon of addictive behaviour on the Internet needs to be refined to improve the reliability and validity of the questionnaire. Third, the methodology of this study doesn't provide information how different online applications connected with addictive behaviour really are – simple correlations do not answer this question. Further research should answer the question as to how the use of exact applications influences addictive behaviour on the Internet. We, for example, repeatedly found high correlations between addictive behaviour on the Internet and downloading or listening or watching music and videos online, but we do not know if downloading is an application which truly implicates addictive behaviour or if it is just a characteristic which many heavy users exhibit.

The presented research also revealed enormous differences between countries in proneness to addictive behaviour on the Internet. It cannot be simply said that heavier and longer use of the Internet generates a higher share of users endangered by addictive behaviour, as is shown in the case of Sweden. The proneness to addictive behaviour seems to be closely adherent to applications and patterns of Internet use in different countries. In the case of Sweden, a longer tradition of Internet use seems to create highly developed connections between daily life and Internet use (such as paying bills). These interconnections lead to an increase in the number of hours spent on the Internet by Swedes, yet they seem to have very little relation to addictive behaviour on the Internet. As already mentioned, we have introduced the results only on two dimensions of addictive behaviour. Further research is needed across more countries.

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4. Motivation of MMORPG Players with Addictive Behaviour in Relation to Internet Use

This part is based on the paper: Vondráčková, P., & Šmahel, D. (2012). Motivation of MMORPG Players with Addictive Behaviour in Relation to Internet Use. *Adiktologie*, 12(1), 24 – 34.

4.1. Introduction

Addictive behaviour on the Internet is a form of risky behaviour which has been studied all over the world (see e.g. Vondrackova & Smahel, 2012, Young & de Abreu, 2010). Researchers describe this phenomenon by various terms, such as: pathological Internet use (Young, 1995; 1996), problematic Internet use (Shapira, et al., 2000), Internet addiction (Widyanto & Griffiths, 2006). To this day there is no agreement on the exact definition of Internet addiction or on whether it is a specific mental disorder or only a symptom of another disorder (Block, 2008; Pies, 2009). Currently, this problem is most often clinically diagnosed as an unspecified impulsive and compulsive disorder (Pies, 2009; Shapira et al., 2000). In this article we will use the term addictive behaviour to the Internet, especially since this phenomenon has not yet been included as an official mental disorder and also because we agree with the presumption of Griffiths (2000) which classifies it as addictive behaviour.

Typically, three basic areas of addictive behaviour on the Internet are studied – addictive behaviour to online games (especially MMORPGs⁹), addictive behaviour to online communication (use of chat applications, email or social networks) and addictive behaviour to pornographic websites or to “cybersex” (sexually-themed communication between two or more users) (Šmahel et al., 2009). Playing online games is one of the activities with the largest addictive potential (Rau et al., 2006), since a large portion of players spend over 40 hours a week in the game (Ng & Wiemer-Hastings, 2005) and playing can thus negatively affect one’s studies or employment and lead to anxiety, deterioration of interpersonal relationships, escape from reality and even to violent behaviour and criminal activities (Barnett & Coulson, 2010; Wan & Chiou, 2006b).

One of the perspectives which can be used to study this phenomenon are the reasons why people spend such a large amount of time playing online games and also the reasons preceding the decision to terminate or limit online gaming. The authors of this study try to answer questions such as: What are the motives for playing MMORPGs for players exhibiting symptoms of addictive behaviour? What are the reasons for MMORPG players exhibiting addictive behaviour to limit their playing? How did they limit the amount of time spent playing? The main contribution of this work is a complex mapping of the motivations for addictive behaviour to the Internet, which additionally to mapping the motives for playing MMORPGs includes a description of the motives for limiting addictive behaviour to MMORPGs and the methods used by players to limit such behaviour. We remark that the last listed area has not been studied in any previous literature yet.

⁹ **MMORPGs** (Massive(ly)-Multiplayer Online Role-Playing Games) are role-playing computer games connecting thousands of players around the world simultaneously in a single, typically fictitious, virtual world through the Internet.

Motivation of players of online games

Bartle carried out the first study focusing on the motivations of players of online games (1996) via the analysis of long-term Internet discussions with experienced MUD¹⁰ players and obtained four types of motivation for playing: (a) achieving results in the game, (b) discovering the virtual world, (c) socialization with others and (d) gaining power over others. The motivation typology of players of online games was further studied by several authors (Hsu et al., 2009; Yee, 2006a,b; Wan & Chiou, 2006a) whereas the motives of players can be divided into four basic categories: achievement, socialization, immersion in the game and escape from reality (see Table 1). The most cited typology, which was also used in other studies, is Yee's typology (2006a, b) based on a data analysis from an extensive questionnaire study (n=3000) which focused on the motivations of MMORPG players. The questionnaire was created based on Bartle's motivation types and the results of previous studies concerning MMORPG players. Yee lists 3 main categories of motives (achievement, socialization and immersion, which includes the motive of escaping from reality), which are then divided to subcategories (see Table 1). Some of the motives falling in the immersion category are often labeled as the flow experience, which is described as a status of absolute concentration during a certain activity, in this case playing a game. The flow experience is often conceived as a uni-dimensional motive (Hsu & Lu, 2004). Chou & Ting (2003) define the flow phenomenon as a motive containing a group of 5 submotives: concentration, playfulness,

¹⁰ **MUDs** (Multi User Dungeons) are text-based role-playing multiplayer computer games, which allow thousands of players from all around the world to be simultaneously at a single virtual, generally fictitious, place. In contrast to MMORPGs, MUDs are not based on a graphics engine. Playing takes place through a text interface (either telnet or another connection client). The text form of the communication places more emphasis on the player's own imagination.

exploratory behaviour, altered perception of time and tele-presence (the feeling of presence in the game despite the player not being physically in the game).

Table 1: Motivation summary of players of online games

	Basic categories of motivation			
Authors of motivation categories	Achievement	Socialization	Immersion in the game	Escape from reality
Yee (2006a)	<p>Development – progress in the game, hoarding of treasure, experience and levels</p> <p>Mechanisms – raising numerical characteristics of characters and their optimization</p> <p>Competition – provoking other players, applying dominance over them</p>	<p>Meeting new people – random chatting and trying to find new friends</p> <p>Relationships – self-disclosure, finding and providing support</p> <p>Teamwork – cooperation, working as a group</p>	<p>Discovery – discovering the world, amassing knowledge and discovering lost things</p> <p>Role-playing – the character and its history, the storyline and fantasy theme</p> <p>Character – its appearance, equipment and behaviour</p>	<p>Escape from reality – including real-life problems, relaxation</p>
Wan & Chiou (2007)¹	<p>Success – the need to achieve success</p> <p>Power – the need to achieve superiority, be in control and support self-esteem</p>	<p>Satisfying interpersonal and social needs – finding friends, strengthening friendship, having a feeling of belonging somewhere</p>	<p>Fun and free time</p>	<p>Emotional coping – shifting attention away from isolation, loneliness, boredom, stress and frustration, relaxation</p> <p>Escape from reality</p>
Hsu, Wen a Wu (2009)	<p>Challenge – fulfilling and reaching goals</p> <p>Control – the ability to learn the game and its mechanics and to use them to reach the player’s goals</p> <p>Competitiveness – the tendency to compete and be better than other players</p> <p>Success - high character level, which is used to determine social status among other players</p>	<p>Cooperation – cooperating with other players</p> <p>Acknowledgment – people notice the player in the game</p> <p>Belonging – being in a specific group with other players</p> <p>Social commitment – peer pressure on players to play longer and more intensively</p>	<p>Fantasy – new experiences, immersion in the game world</p> <p>Curiosity – the sensory curiosity from impulses in the game world and cognitive curiosity from the game principles and knowledge of the game world</p>	

Koo (2009)	Epistemological curiosity – playing perceived as a source of experience and skill	Social affiliation – the socialization of players in the game	Concentration – maximal immersion in the game Entertainment – perceiving participating in online games as a welcome and exciting form of entertainment	Escape from everyday routine and boredom
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¹ this study was carried out on players fulfilling the criteria of Internet addiction

Yee's studies (2006a, b) of the motivation categories show that the achievement category is preferred by men, especially the younger age categories, while women more frequently listed the socialization and immersion categories and young women the escape from reality category. Studies differ in which motive is listed most frequently; this could be due to different research methods and different samples. However, authors generally agree that players list the achievement category as the most important one (Jansz & Tanis, 2007; Suznjevic & Matijasevic, 2010; Williams et al., 2008). Suznjevic & Matijasevic (2010) tried to connect the motives with online playing activities and concluded that players who prefer the achievement motive more frequently spent time in the game raiding, while those preferring the socialization motive were more frequently interested in communication followed by raiding and those preferring the immersion motive in searching for and carrying out quests.

Wan & Chiou (2007) divided motives for playing online games into two groups: internal motives (motives arising from the individuals themselves – in case of playing online games this includes for instance the motives of curiosity, autonomy, belonging) and external motives (motives arising from the environment, e.g. in the form of money, glory or power). The results indicate that individuals with symptoms of addictive behaviour on the Internet recorded higher levels of internal motivation, while individuals without these symptoms

recorded higher levels of external motivation. Hsu, Wen and Wu (2009) studied which motives are connected to addiction to online games, and have found that these are especially the motives of discovery (immersion), belonging and social commitment (socialization) and the motivations of development and success (achievement). Yee (2006a) lists that escape from reality and the achievement significantly correlate to problematic playing of online games. Chou & Ting (2003) connect the flow experience to a higher probability of being addicted to games. Williams, Yee and Caplan (2008) compare the motives with the amount of time the respondents spend in the game, and their results indicate that the socialization and achievement motives positively correlated to the amount of time spent in-game, while the motive of immersion negatively correlated to it. The authors' explanation of this is that discovering the game and character development are not as motivating for playing the game longer when compared to socialization and achievement.

4.2. Methods, sample and data analysis

In the presented qualitative study, we focus on studying the motivation for addictive behaviour on the Internet in MMORPG players. The data was gathered during 2010 from offline and online interviews with MMORPG players. The players were pre-selected via a questionnaire focusing on addictive behaviour based on the dimensions of addictive behaviour on the Internet in accordance with Griffiths (2000). The questionnaire was used and tested in the previous quantitative study within the World Internet Project by the authors of this article (see Šmahel et al., 2009). The criterion for selecting respondents of this study was that in three out of five dimensions of addictive behaviour they answered "often" or "very often" to at least one question in each dimension (where each dimension was

represented by two questions). The answers "often" or "very often" correspond to a high prevalence of the type of behaviour in the appropriate dimension of addictive behaviour. The semi-structured interviews focused on the following subjects related to playing online games: type of activities, development of play, motivation, the gaming community, interpersonal relationships, self-perception of addiction, real life of the player, his or her other interests, and future prospects. The obtained interviews were primarily used to record data related to the subject of motivation and development of playing, however we have also used the context from other parts of the interviews.

The participants of the study were asked for an interview on the subject of addiction to the Internet through the interface of the World of Warcraft online game by Blizzard Entertainment. The participants were chosen so that both genders and age categories were represented. 16 players agreed to provide an interview out of the asked 45. Out of these 16 interviews in total, 9 occurred online through a chat application and 7 offline, depending on the preferences and options of the participants. The recordings of offline interviews were transcribed and online interviews were copied from the web application. The sample included 4 women and 12 men aged 15 – 33 years with an age average of 20 years. This distribution corresponds to the fact that MMORPG players are mostly male (Barnett & Coulson, 2010). Eleven participants were students and five worked (one of these was unemployed at the time of the interview). Nine respondents were single. The number of hours they spent on the Internet ranged from 20 to 70 hours per week, with an average value of 41 hours per week. The listed length of play was 1 to 6 years with an average of 3 years (see Table 2).

Table 2: Basic data of study participants

Fictitious name	Age	Gender	Status	Employment	Hours per week	Length of play
Karel	18	male	Engaged	student	30	1 year
Hynek	19	male	Single	student	65	6 years
Jan I	16	male	Single	student	55	3 years
Tomáš	15	male	Single	student	23	2 years
Lukáš	17	male	Single	student	65	2 years
Helena	33	female	Married	unemployed	35	5 years
Jaromír	18	male	Single	student	70	5-6 years
Lucie	18	female	Engaged	student	20	1.5 years
Matouš	23	male	Engaged	student	25	5 years
Petra	15	female	Single	student	40	1 year
Jaroslav	21	male	Engaged	employed	40	2 years
Pavel	17	male	Single	student	56	1.5 years
Hana	15	female	Single	student	23	2 years
David	28	male	Single	employed	35	3 years
Jan II	25	male	Married	employed	35	3.5 year
Roman	27	male	Engaged	employed	35	3.5 year

The first phases of the data analysis were performed by open coding based on the grounded theory (Strauss & Corbin, 1999). The records of interviews identified significant units related to the motivation of players, which were then categorized by significance. The next phase utilized the methods of Miles and Huberman, specifically simple listing and creation of clusters (Miovský, 2006).

4.3. Results

During the analysis, results were divided based on the research questions to two main categories: motives for playing online games (the reasons why respondents play online games and why they spend a lot of time in game) and motives for limiting the amount of time spent playing online games (reasons and stimuli which caused the player to limit or stop playing online games). Each of the basic subjects included several subcategories, which we describe below.

Motives for playing

We have found that the motivation for playing is dynamic and gradually changes for individual players. The motives which attract players to the game and are prevalent in the beginning of their "gaming careers" are not the same as the motives for playing online games later. The motives for playing include both motives experienced by players during the interviews as well as the reasons respondents returned to playing online games after they decided to completely or partially quit. Players listed four basic motivations:

a) Relaxation

This motive generally manifests as relaxing by simply transferring attention from the real life into the game, which may allow players to relax after a long hard day or escape from an unpleasant reality or certain worries. One respondent concisely described this function of playing:

"... I go home from school, it's quite a distance and I'm tired, grumpy and can't wait to get home, especially if I know that I need to go somewhere later in the evening. So, I get home, turn the computer on, make myself something to drink and wait for everything to startup, login, say hi to my friends in the guild, talk to

them, find out what's new etc. and this makes me happy. It's a form of relaxation, someone likes to take a bath, someone watches TV..."

This category also includes active relaxation, such as one player who vents the tension he feels in real life, probably because of an incapability of assertive behaviour in real life, through aggressive behaviour in the game:

"I mostly play to do damage => I prefer murdering, stealing, doing anything dirty (a guy needs to relax after a long day) – after the tension caused by ... the outside world, politics, government, people, school, there's so much to worry about". He also adds: *"I can't imagine being violent or vulgar to anyone in real life. I'd say that in the game I'm exploring otherwise unrecognized possibilities".*

In relation to this fact, we may only speculate that it is exactly the motive of relaxation from the often harsh reality that may cause players to return to the game. For instance, one player stated that he began playing more often when his girlfriend broke up with him, since he was feeling down and playing helped him avoid thinking about this unpleasant situation. Other respondents state that they began playing more when they lost their jobs or moved to a new environment.

b) Self-realization

Another motive which is frequently listed in many forms is self-realization. As stated by respondents, this takes the form of development in the game and using various options offered by the game (improving one's character, reaching goals, winning matches or fights), which then lead to a feeling of success, knowing that one is good or better than the others. In relation to this, some respondents also emphasize the fact that self-realization via an online game is often easier in comparison to other activities, especially since they have much

more control over what happens in the game in comparison to real life. For instance, one player stated:

"the game offers an easier path to self-realization, I'm a creative person and like to create stuff, be it web pages, graphics, poems, games, anything... in the game this is more or less easier to do".

Another mentioned aspect of this motivation is the possibility of one's own professional development. Some respondents became interested in and began developing their programming skills, even becoming game administrators. One of the respondents claimed:

"once I became an administrator, for the first time I was in a sense forced to begin learning how the game works. That's how I began learning programming languages. At first this included standard html, css, then I realized that the game is actually based on php, and so I also learned that. All of this has brought me to making web pages, and that's what I still do today to make some extra money."

As discussed above, success in the game seems to be a significant motive for playing.

c) Contact with people

A significant number of respondents (13) said that the game is an important means of interpersonal contact, for instance with the friends they play with. The game is a good conversation subject and sometimes leads to the strengthening of already existing friendships, such as the case of the following respondent:

"To tell the truth, when I played with my guy-friends (and one girl) who used to be and still are important for me, I was happy..."

Another variant of this motivation is contact with new people, which could take the form of replacing the absence of interpersonal relationships related to deteriorating social skills, which some experts such as e.g. Caplan (2005) or Davis (2001) use to explain the creation of Internet addiction. For instance, consider the following statement of one player:

"well, since playing basically took away my childhood, especially in puberty (13+), when a person kind of finds those friends that tend to last longer than before, I kind of use it to replace contact with people, I'm a bit of an introvert, not that I don't have friends but I guess I can't really open up to them like I do in the MMO, where they're simply just teammates and you don't really care about the consequences."

In this context, respondents also often claimed that additionally to game-related subjects they often discuss personal subjects with real or game friends, and that the personal subjects actually predominate over game-related ones. One female respondent stated:

"with old friends it's 30:70 in favor of personal subjects, for newer ones it's 60:40..."

The respondents also list that the reason for repeatedly returning to the game is often contact with people, because their game friends kept persuading them to return to the game or because their friends kept talking about the game which motivated them to return to the game.

d) Coping with boredom

The last motive for playing online games which appeared in the interviews was coping with boredom. In this respect, playing online games was often

mentioned as one of the least boring activities. For instance, one participant said:

"... And what else should I do? I don't watch TV, I think that's just garbage. I'm not into cleaning or sports. I usually don't feel like reading. Basically, if WoW is the least boring activity..."

It may also be speculated that coping with boredom is a motive for repeatedly returning to the game due to some external event; the most often mentioned ones were health problems and losing their job.

Motives for limiting playing

This category includes motives which players list as impulses to limit the amount of time spent in an online game or to quit the game completely. Respondents more frequently listed external motives (health reasons, impulses from the environment, from the game) than internal motives (realizing one's addiction). Analysis of our interviews has shown the following 4 motives for limiting or quitting the game.

a) Realizing one's addiction

Some respondents (2) stated that the reason for limiting the amount of time spent in the game was that they suddenly realized that the game started interfering with their lives. It may be speculated that this motive could be related to realizing one's own addiction to the game. For instance, one respondent speaks about circumstances which motivated him to stop playing, although only for a short time:

"... I'd say that it was the moment I realized I didn't want to see people and wanted to play ... I guess I just decided that enough was enough... you

could probably say that the game completely devoured me... I quit for good, but then the thought of playing started nibbling at me again..."

On the other hand, it should be mentioned that the actual realization of one's addiction does not cause all players to limit their time spent playing. On the contrary, some respondents consider themselves addicted but do not change their behaviour. Consider the following example:

"... yeah I'm addicted, I don't care that much though, it's simply who I am... it's the same as my addiction to nicotine. If I feel the urge to light a cigarette, I'll simply do it... with playing games it's the same..."

b) Health reasons

One respondent said that the main reason for his limiting the time spent in the game was health problems, specifically headaches:

"... my head hurt a lot back then, so I tried to play less, nowadays I don't work with computer as much as before, it's still a lot but at least now my head doesn't hurt ..."

Another respondent said that he could imagine limiting time spent in game due to a serious illness. However, a third player said that he actually started playing more when he broke his leg, was at home and had no way of spending his free time. From these individual cases, it is reasonable to assume that the motives for limiting play time could include health problems which prevent actually playing the game, such as a serious illness or headaches.

c) Impulses from the environment

Respondents frequently mentioned impulses from the environment as a real or hypothetical reason for quitting or limiting time spent in the game. The respondents describe two forms of impulses from the environment: positive ones

and negative ones. Positive impulses most frequently take the form of a new romantic relationship, such as the case of one respondent:

"... only a girlfriend who didn't want me to play could provide sufficient motivation to stop playing... "

Another form was game activities, which could at least temporarily be much more attractive than playing the same or similar games. In case of substitution by offline game activities, players most frequently list classical PC games or "nintendo" (an offline gaming console):

"...I stopped playing lately, I downloaded new games for nintendo and I'm playing those now... definitely declining (about online gaming), I've got something new now and I'm playing that... but I know I'll regain interest, this is just a short break, the nintendo will not keep me occupied for long, and especially once someone gets ahead of me ... I'll go mad and get back." After these effects disappear, there's a risk that the players will return to the virtual world, as some have mentioned. It may thus be speculated that these external impulses are mostly temporary and players return to the game once these effects disappear.

Some respondents also mentioned possible negative effects, most frequently conflicts with work and school obligations or some form of prohibition from the outside.

"... but once I start in my new school, I'll limit it to almost nothing or quit outright, since the school's hard, I'll limit time spent in the game in favor of learning, so that I can finish graduate"

One respondent said that the reason for limiting playing was conflicts with friends, who complained that she doesn't have time for them because of the game.

d) Impulses from the game

The last group of real or hypothetical motives to limit or quit provided by players were related to the game itself. These motives can be divided into two basic types: motives due to an external decision to quit and motives due to an internal decision to quit.

With respect to the first category, players listed reasons such as finishing the game, end of the game itself, arguments with guildmates. These were mostly hypothetical. Finishing the game or the actual end of the game are not very realistic in case of MMORPG games, since their operators try to continuously keep the game updated so that it remains attractive to its players (Barnett & Coulson, 2010). It could be speculated that listing this hypothetical reason could point to the fact that the players are currently very motivated to play and can only imagine quitting due to some radical external action.

The second category includes reasons related to the player getting bored with the game, as was the case of one female respondent:

"... I became a little bored from the feeling that I fully understand the game, so I only played for about 30 minutes a day, then a new patch came out and I wanted to find out what changed, what new options are there now, which locations were added... the time kept increasing and then this whole cycle repeated itself... "

It may be assumed that the game starts to bore the player when he or she finds a new distraction in the form of impulses from the environment, which are

stronger and the online game becomes boring in comparison. Here it may be speculated that these motives may be connected to the motives of impulses from the environment; for instance the beginning of a new relationship and being in love may temporarily overshadow the entertainment provided by the online game. The reason the respondent listed this as an impulse from the game and not an impulse from the environment may be related to a different perspective and description of the change.

Limitation strategies

In relation to motives for limiting the game, players also mentioned concrete strategies for limiting online game. These may be divided into two basic groups. The first strategy is a gradual limitation of gameplay in conjunction with substitution by other online applications with a "safer profile", such as another online game where the player doesn't need to spend as much time online (one player mentioned the game "Ultima Online") or Facebook. The second method is uninstalling the game from their computer. In this respect, it is an interesting finding that although most people said that they consider themselves addicted to the Internet, in most cases this realization meant nothing to them and they did not feel the need to seek expert assistance.

4.4. Discussion and conclusion

This qualitative study focused on mapping the motivation of players of online games, specifically the reasons for playing online games, spending a lot of time in such games, and the mapping the causes or impulses for trying to limit or quit the game. Through an analysis of data obtained from semi-structured

online and offline interviews, several motives for playing and for limiting time spent in the game were identified.

Players provided the following motivations for playing: relaxation, self-realization, contact with people and coping with boredom. The primary discovered motives were also found in analogous or similar studies mapping this subject conducted abroad (Bartle, 1996; Hsu et al., 2009; Yee, 2006a,b; Wan & Chiou, 2006a,b). Within the self-realization motive, players listed a completely new submotive – playing online games with a goal of professional growth and the possibility of making a living in this or a similar area. It is interesting that only two of the above-listed studies (Yee, 2006a, b; Wan & Chiou, 2006a,b) mention the motive of relaxation, which was the most frequently cited motive in our study. Yee (2006a) actually does not even list it separately, and instead places it into the "immersion" category. With respect to this fact, it could be speculated that the reason for omitting this motive is the fact that the studies were carried out on a sample of respondents who perhaps did not exhibit symptoms of addictive behaviour to the Internet, and it is possible that this motive could be somehow connected to addictive behaviour to the Internet. Another contribution of this study is ascertaining the fact that motives change with time and those motives which caused the players to start playing an online game might not be the same as the ones which lead them to continue playing. Yee (2006a) mentions that the current motivation of the player could also depend on their mood.

No studies mapping the motives for limiting online gaming were found in available literature. However, these could be discussed with motives for quitting addictive behaviour (Blomqvist, 2002; Cunningham et al., 1999). Motives for

limiting the amount of time spent playing an online game listed by participants of our study may be grouped in 4 categories: realizing one's absorption in the game, health reasons, impulses from the environment, impulses from the game. The motives listed above may be divided into motives which are related to or follow from a possible addiction to online games and motives which are not related to potential addictive behaviour.

The first group of motives related to addiction to the game contains the first two motives (realizing one's absorption in the game, health reasons) and negative impulses from the environment. The motive of realizing one's absorption corresponds to the reflex of one of the dimensions of addiction to the Internet by Griffiths (2000) – salience, which manifests itself by the addiction to a certain online application becoming the main subject of one's thoughts, behaviour and experience. On the other hand, players often mentioned that they are "addicted" in interviews, but this notion had no actual value for them and did not cause them to interrupt their addictive behaviour. Instead, they tended to simply treat it as a statement which does not carry negative implications. This fact is in agreement with previous studies (e.g. Šmahel et al., 2008; Yee, 2006 a, b), where the perception of the player's "addiction" might not correspond to his or her actual addiction (measurable e.g. via symptoms) and does not come with a signal for limiting addiction. The word "addiction" is often used by players to explain that they in some sense need to play and that playing is a part of their lifestyle. In case of limiting gameplay for health reasons, we can speculate that health reasons could also be a consequence of excessive play and this is in fact cited in literature (e.g. Chou, 2001; Suhail & Bargees, 2006). The motive of negative impulses from the environment could correspond to the dimension of

conflict, which is mentioned as the most significant component of addiction to the Internet (Griffiths, 2000, Beard & Wolf, 2001). However, respondents mentioned external conflicts (fights with friends) as well as internal conflicts (conflict between playing the game and studying for school or working). It can thus be speculated that if players list these motives as possible reasons to quit, they are to a certain extent aware of their own addictive behaviour in the game. On the other hand, positive motives from the environment in the form of a new game or new partner and motives originating from the game are not necessarily consequences of addiction to the online game and it may thus be speculated that these respondents do not quit or limit their gameplay because they feel addicted, but rather because they simply found a new way of fulfilling their needs. The existence of two basic types of motives for quitting an addiction may also be found in specialized literature describing motives for quitting an addiction to a psycho-active substance (Blomqvist, 2002; Cunningham et al., 1999; Maierová, 2010). Here, we may find reasons originating from the addiction itself, such as health reasons, problems with the law or work-related and financial problems, as well as reasons which are not necessarily caused by the addiction, such as positive key events, esoteric or spiritual experiences or changes of the situation. In comparison to the motives for changing one's addiction to psychoactive substances (health reasons, financial problems, humiliating or horrible experiences, existential or personal crises), we see that the motives of players mirror the fact that addictions to online games do not come with such severe consequences as addiction to psychoactive substances. This may also partially explain the fact that individuals addicted to the Internet do not often seek expert assistance (Blomqvist, 2002; Vondráčková & Šmahel, 2012).

When exploring the motives for limiting gameplay, it is interesting to note that respondents who exhibited signs of addiction to the Internet or risk factors of such addiction (measured by a non-standardized questionnaire) mentioned external motives more frequently than internal motives. Although at this point this is only a hypothesis which needs to be verified by a quantitative study, this finding may have an interesting overlap to the clinical area in the sense that players exhibiting signs of addictive behaviour on the Internet mostly reduced this behaviour based on an external rather than an internal impulse. This fact corresponds to a theoretical presumption of the trans-theoretical model of Prochaska and DiClemente (1992), based on which the primary motives for changing any behaviour are mostly of an external nature and internal motives only apply when the change needs to be maintained, including confidence in managing and keeping the change.

It is interesting that none of the respondents stated that they considered seeking expert assistance when limiting or quitting the game. This opens the question of how many people actually seek help in these cases and how devastating an addiction to online games actually is for the player's life. Studying the motives for quitting addictive behaviour also found that addictive behaviour to online games does not have constant addictive symptoms and that these could significant change based on the life of the player.

The presented results have a limited application due to the qualitative nature of the research. The characteristics of addictive behaviour on the Internet were measured via a questionnaire which was not standardized. The results could also be affected by the fact that participants in the sample were contacted in the environment of the online game World of Warcraft, whose specific focus on

adventuring and conquering could project into the types of motivations provided by players.

The results of this study also open up further questions which could be the subject of future research projects. For instance, these could try to find a formula for the development of motivation in time, or study how often and under which circumstances players of online games with symptoms of addictive behaviour seek out expert assistance, or whether there exist parallels between addictive behaviour on the Internet and addictions to various substances.

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5. Addictive behaviour on the Internet – case study

This part is based on the paper: Vondráčková, P. (2011). Závislostní chování na Internetu - případová studie [Addictive behaviour on the Internet – Case study]. *Česká a Slovenská psychiatrie*, 107(5), 577 - 583.

5.1. Theoretical introduction

The phenomenon of addictive behaviour on the Internet first appeared in literature in 1995 in the text where an American psychiatrist Goldberg (1995) described it as a form of a new mental disorder. Although this text was written primarily to entertain the online community, the name and description of this problem is widely used. American clinical psychologist Young (1996) described the phenomenon of addictive behaviour on the Internet in 1996. Since then, the subject attracted the attention of professionals around the world. In some countries such as the U.S., China and South Korea began to develop the first specialized centers focused only on this clientele (Block, 2008).

In general, the use of addictive behaviour on the Internet is defined as the excessive use of the Internet, which brings psychological, social, work or school complications to the individual (Beard & Wolf, 2001). Some experts (e.g. Šmahel et al., 2009, Young, 1998) argue that one does not become addicted to the Internet in general, but rather to certain Internet applications that fall into three

basic categories (online games, pornographic sites and communication applications such as ICQ or social networks). Several experts proposed diagnostic criteria to identify this phenomenon (Young, 1998a, Beard & Wolf, 2001, Griffiths, 2000). Treatment approaches to this problem can be found in literature (Huang et al., 2010; Young & de Abreu, 2010). Addictive behaviour on the Internet is still somewhat out of favor of primary prevention programs, but a new generation of programs focusing on life-skills, such as the Unplugged program EUDAP (Jurystová, Miovský, 2010) could lead to an improvement in the future because we can expect a positive response to these problems.

According to international surveys, addictive behaviour to the Internet is among 3-6% of its users (Greenfield, 1999; Whang et al., 2003). Similar results are reported in the Czech Republic (Šmahel et al., 2009) where 3.7% of Internet users were at risk and a total of 3.4% could be described as having developed addictive behaviour, giving a total of 7.1%, which is a quite high number of risky Internet users. Most at risk are persons aged 12-19 years, where the prevalence in both categories reaches 7.9%.

The main reason for presenting this case study is to add to this theoretical concept deep focus and plastic picture.

5.2. Case study

Introductory session

Denis was 35 years old when he took an appointment for a consultation. The immediate reason for that were the incessant quarrels with his wife because of his playing the online game Wild tribe. His wife got a suspicion that he might be addicted to the Internet and gave him a phone number to get an

appointment. Before the session Denis filled in a questionnaire on the Internet concerning addiction to the Internet. He got a high score concerning the use of the Internet in general and also when answering questions concerning the game itself. But he was not really convinced that he might be addicted to the Internet because, in the past, he used to have periods in his life when he was working very hard (his wife called these periods "episodes of workaholism") and now he thinks that the focus for his enthusiasm has become the online game. Another reason for him to doubt his addiction to the Internet was that he spent a varying amount of time playing the game depending on what was happening in the game. He also said that his wife minded him playing because she was on maternity leave and expected him to spend time with her when he got home after work.

Denis is living quite a happy family life. His wife was his first girlfriend, they have known each other for 17 years and have two daughters aged 2 and 7. He has small conflicts with his wife because of the time he spends at work or playing online games at the expense of the household tasks or family care. He is a co-owner of a small IT company and is happy at work as well. During the first session I noticed that Denis took an observers attitude and at the same time kept what he was telling me under strong control. I could feel that he was attentively observing my behaviour. At the end of our session he asked in detail for my opinion about his problem.

He set his target to stop playing the game or to reduce playing and learn more about the potential reasons for his Internet overuse.

Denis attended psychotherapy for 3 years, regularly once a week. The process of the therapy could be thematically divided into three parts: In the first

period we tried as much as possible to map his addiction to the Internet, and then our attention moved to his private relationships, mainly with his wife, children and his mother. After two years of therapy Denis started to speak more about his problems at work which have been worrying him ever since.

Addiction to the Internet

Denis discovered computer games during his university studies. He remembers that he got his first game from a friend. At that time it was a way for him to "switch off" from everyday activities and studying and also a way to get rid of the fatigue from studying until late at night. After graduating he would play a game, which lasted for between one and three weeks, several times a year, usually to escape everyday problems. He would then sit in front of the computer until late at night which was sometimes a source of quarrels with his wife.

As an IT specialist, Denis spends a lot of time in front of the computer and connection to the Internet is a basic condition for his work. He found the online game about a year ago during one work task. He tried to get connected and he continued playing since he found the game interesting. He admits that the first reason to continue playing for him was that he was curious. He was trying to understand the principle of the game, why the others like playing it so much and at the same time he wanted to find out what are the optimal economic strategies of the game. Initially he was playing in just one game "world" then he tried to spread his activities into two other worlds. After not even six months he decided to leave one "world" were he was quite successful because he could not spend as much time playing as his online partners wanted because of family and

professional reasons. In the other "world" he progressively got to found a brand new tribe where he got one of the leading positions.

Even though he decided to leave one game world to have more time for his everyday life, he still spent a lot of time playing. As was already said before, the time he spent playing depended considerably on what was going on in the game. When conflict solutions were needed, he was able to spend up to 8 hours a day playing. His normal day with the game was as following: He woke up at 6:30. Then he would spend between half an hour and hour playing. At work he would check on the progress in the game several times a day. Sometimes these checks would last up to 30 minutes, or even an hour, which would make him feel guilty since he did not have enough time left to take care of his work tasks. He would come home between 6 or 7 PM. Around 8 PM he would sit behind his laptop again for between 2 and 4 hours which was a source of frequent quarrels with his wife who wanted to spend the evening with him. He would naturally spend a lot more time playing during the weekend. When he was not online, he was often thinking about what was going on in the game, mainly the conflicts and strategies which would be the most important at that particular moment.

During his playing he "virtually" met Lenka who took an important part in his world. He was in a close contact with her during the playing and gradually their relationship became quite strong. Everyday they would discuss not only the progress in the game but also their personal life. Lenka lived in Moravia, was married and had three children. They even met once during Denis's business trip. They always stayed only friends but their partners did not know about their meeting. What Denis probably liked the most about this relationship was that he had in his online game someone who was listening to him, supporting him and

accepting him. During the first months of the therapy Denis often talked about frequent conflicts and lack of comprehension from other players which was unpleasant for him. He used to feel the same lack of comprehension during the basic school where it was difficult for his schoolmates to understand him. Several times he wanted to leave the game because of these conflicts but Lenka always managed to convince him to stay. He said that she was practically the last reason for him to stay in the game. After about six months Lenka's husband found out about his wife's close online contact with Denis which made him furious and Lenka had to stop playing. Denis then lost his last motivation to stay in the game.

Relationships in the family

Denis said that he spends a lot of time thinking about what is going on in the game when he is at home, about how to work out conflicts with his co-players and therefore he is practically mentally absent. He realized this quite clearly when he passed a sharp knife to his two-year-old daughter because she asked him to. We then focused more on his mental absence at home. Denis started talking about his feeling incompetent at home especially at the weekend when he spends most of the time with his family. Denis's wife is a real perfectionist and she always has a clear vision about how to take care of the children or how the flat should be cleaned. However very often Denis did not fulfill her expectations which would cause repeated conflicts, especially, as mentioned above, during the weekends when the whole family was together. Denis then had a permanent impression that he always does everything at home at only 50 percent which he, as a perfectionist, perceived as a personal failure.

He talked about a frequent conflict: his eldest daughter, who is very emotional, has many quarrels with his wife. His wife always wanted him to step in. Denis would usually intervene in a rather rough way which would cause his wife to take a position against him, on the side of their daughter, and again he would get the feeling of failure. We would also repeatedly talk about how it is difficult for him to defy his wife and her demands which he would in most cases consider as appropriate. At the beginning it was very difficult for him to imagine that he could stand up for his opinions or be in the right. He said that it would mean a fundamental change in his convictions for him.

Progressively we came to the fact that he used to have the same feelings as a child where his emotions and behaviour would always be criticized or contested by his mother. Other people's opinion was always very important for her and she would very often reprimand Denis when he talked about his everyday life with his father, whom his mother divorced when Denis was three years old. She would have the same reaction when she thought that he said something inappropriate to his teachers in the kindergarten. At home she used to tell him that together they both had to fight against the hostile world. In her opinion Denis, by talking about their everyday life, would break their alliance. His mother gave him information that people tend to abuse other people and he started to fear being abused. He was afraid of being criticized again by his mother or abused by other people which resulted in his not talking to his father or other people and playing alone. This behaviour, where he would retreat to his own world, was also supported by his mother's and her later partners' strict education methods. He remembers that they would put him under a cold shower to calm him down and make him obey.

His mother was very emotional and would have different, often opposite reactions to the same thing. It was difficult for Denis to anticipate or understand her behaviour. It may be the reason why he started studying ethology – to understand more her behaviour and the behaviour of other people which was, and still is, difficult for him to understand. Until today Denis tries to avoid his own emotions because he often considers them irrational, unpredictable and biased. He tries to adopt the attitude of an objective observer. We can also partly see his fear of excessive emotions in his complicated relationship with his eldest daughter. He calls her hysterical and they have frequent conflicts. He tends to escape the conflictual situation and usually leaves without saying anything. During earlier sessions it was difficult for him to understand and talk about his own emotions which also resulted in his problems to remember a conflict which he had with his wife or daughter a few days ago.

This avoidance of socializing whenever a problem occurred resulted in Denis not being able to develop his social skills during his teenage years. Underdeveloped social skills together with his fear of getting hurt by other people mean that he does not have any real friends that he would see regularly. As a family they see only his wife's friends. It happens regularly that he gets into a very intimate topic with husbands of his wife's friends, who do not react positively and Denis again does not feel competent and prefers to keep distance and not to talk to them at all. Oscillation between distance and excessive intimacy in human relationships was present even in our relationship where at the beginning Denis would combine intimacy and reserve. It also happened to me very often that it was difficult for me to tune into Denis's feelings and to

understand what he is talking about, what his view of the situation was, which would be a parallel to his own feelings.

Denis would feel incompetent especially in social situations where emotions and social skills were needed, things he did not master and did not understand. He felt much more competent at work where he could rely more on his brain and performance. His grandfather who was a hard-working man was given as an example to him since his childhood. Denis's mother appreciated when he was working with her in the cottage and that he started to make money early. Denis managed to build up his own IT company and he has been leading it successfully. He says himself that he feels much more competent at work than in a social environment. The fact that he spends too much time at work or with the online game (where he wanted to understand the principle of the game, understand why other people like playing it so much and find out what are the optimal economic strategies of the game) explains that he prefers activities in which he is successful and feels self-confident. At the same time he tries to avoid social situations where he is less successful because, as he says himself, he never knows exactly how to explain and understand someone's behaviour.

Relationships at work

After about two years Denis started talking about his problems with clients at work. I could see that all of the sudden he would find our sessions much more beneficial because they helped him to solve conflicts with colleagues and clients, which again shows how important work is for him. When describing a current problem with one client he started to realize that he had similar conflicts with the same client roughly at the same time when he discovered the online game. He

started to consider the possibility that the online game playing might have been a sort of a relax and escape from the problems with his client who even started to question his ability to lead a company. Denis admits the possibility that when he has a conflictual situation at work he gets rid of the stress through another activity. Two and a half years ago it was playing the online game and lately it has been his new passion for buying real estate. He started to spend a lot of time during the week and at weekends choosing property on the Internet, then renovating it and dealing with the tenants. With time we came to the conclusion that his mental absence and lower attention is not only present in his family life but also at work especially when problems in communication with clients occur. Denis then feels incompetent at work.

When facing conflicts at work, Denis would again have problems with standing up for his opinions. He would tend to leave problematic situations. We repeatedly talked about situations at work, where clients were arrogant towards him or would accuse him of things which were not true. Denis usually did not say anything in these situations and would only listen to the complaining client. It was similar at home where it was unthinkable for him to oppose to his wife and tell her openly when he does not agree with something or does not like something. He explained that he always tries to understand other people's point of view and does not have the capacity for his own feelings anymore and therefore cannot acquire necessary arguments to defend him. He progressively managed to get more assertive at work which led to less conflictual situations with clients and at the same time he did not have to spend days and weekends thinking about how to solve the situation.

5.3. Discussion

In this paper we present a case study of a man who sought the therapy because of addictive behaviour on the Internet. Over time, however, other topics directly and indirectly related started to appear. As in the case of other types of addictive behaviour, we can see that the actual addictive behaviour is just the top of the iceberg of different problems that needed to be work out in a therapy.

If we compare the data obtained in the process of psychotherapy with the Internet addiction research, the nature of client problems is accordance with frequently reported cause of Internet addiction, a lack of social skills (Caplan, 2005, Davis, 2001). This has very close relationship with introversion and shyness, frequent features of persons showing signs of Internet addiction (Mehroof & Griffiths, 2010; Morahan-Martin & Schumacher, 2000; Yang & Tung, 2007). Above mentioned characteristics are manifested in problematic interpersonal relationships (Liu & Kuo, 2007). Psychodynamic approaches put the problematic interpersonal relationships in the context of complicated family relationships, which in the case of presented client as well. Motivations for playing online games in the case of this client have dynamic character. He started to play in order to relax from occupational problems (escape from reality), and because he wanted to understand the principle of the game (immersion in the game). But then he continued playing because of other players, with whom he created quite a close online relationship (social contact). Motives for playing online games are in accordance with those reported in the literature (eg Yee, 2006; Wan & Chiou, 2006; 2007). The reason for the termination of online playing was arguments with his wife (impulse from outside) and also conflicts in the game itself (impulse from the game). Repeated conflicts

with his wife were the main motive to seek out professional help, though the client himself thought that the addictive behaviour on the Internet was not his problem. His original external motivation to seek out professional help was gradually transformed into internal motivation (Kennedy & Gregor, 2009), because the client realized that therapy could help him to understand more the people around, improve conflictual family relationships and learn how to be more assertive at work. However after terminated playing online game after several months of therapy, he attended the sessions for three more years.

Regarding the dimensions of addictive behaviour according to Griffiths (2000), the salience was manifested by the fact that the client spent a lot of time online, and often thought about the conflict in the game and how to move the game forward when offline. The logging into the online game calmed him down and helped him forget about the problems at work (mood modification). Over time, however, he began to perceive his time in the game as another performance obligation. The dimensions of the conflict manifested themselves in the form of quarrels with his wife, because he would neglect his family, but reported internal conflicts, such as neglecting his work. The client also repeatedly tried to quit the game, but from the beginning was always persuaded to return to the game by his online colleagues (relapse). Tolerance was manifested by the fact that he needed to spend more and more time in game. After some time his playing online game had rather a dynamic nature and changed according to the game situation. The client reported that he sometimes felt grumpy or irritable, if not able to be online but this feeling rather than to withdrawal symptoms related to the fact that he promptly needed to solve some problem in the game.

If we try to characterize the client personality through the psychodynamic diagnostic (Dougherty & West, 2007; McWilliams, 1994; Riemann, 1998), we can say that he fulfills the criteria of schizoid personality, which typical defence mechanism or way of coping with anxiety is isolation (Riemann, 1998), or in other words, withdrawal from the world (McWilliams, 1994), especially from complicated interpersonal relationships but also from some aspects of their experience. The formation of this way of relating to the world can be traced in the client's biographical background, especially in his great innate sensitivity and vulnerability as well as in upbringing by his mother who supplied him with plenty of the emotional stimuli that were often quite contradictory. It was better to disconnect from the mother to prevent him from being emotionally overwhelmed by her. Therefore, he took the distance from his emotional experience because he perceives it as unreliable, together with the emotional reaction of his mother, and continually began to be more immersed in the performance area where he felt more competent. Thus we can see the fact, which is often described in people with schizoid structure, that they prefer more intelligence and perception of sensory organs, which promise them a better orientation in the world (Riemann, 1998). The client was strongly focused on his work at the expense of spending time with family and friends. When appeared the relationship problems with a client at work, he needed to relax from his difficult situation by playing online games. At the beginning he was interested mainly in getting to know the principles and strategies in the game. Eventually, however, even in this area emerged conflicts that client experienced very uncomfortable and partly because of them stopped playing the game. Online gaming was replaced with another

performance activity which was the process of finding, buying and taking care of some properties.

From this perspective, the therapy helped him to gain more orientation especially in behaviour of other people and scrutinize his feelings in a secure environment. The context of this adds even his idea to him my notes from sessions to more understand how I think about him and how I perceive our sessions. His schizoid adjustment was reflected in our therapeutic relationship, where he alternated distance in our relationship during the session and my frequent experience of a very challenging tune on his experience and perception of the world.

Based on this concept we can speculate that it was a defence mechanism withdrawal that became the main motivation for addictive behaviour on the Internet, which helped him to relax from the world and that the combination of a lack of social skills, shyness and introversion, which is described in the literature about Internet addiction (Mehroof & Griffiths, 2010; Morahan-Martin & Schumacker, 2000; Yang & Tung, 2007), can refer to the more frequent occurrence of schizoid structured individuals who present with symptoms of Internet addiction.

5.4. Conclusion

In this paper is presented a case study of a man who had come to the therapy with the problem of addictive behaviour on the Internet. Over the time, under the surface of the addictive behaviour on the Internet began to appear much more fundamental issue - his tendency to withdraw to his own world and from his emotions as a result of negative experiences during his childhood with

his mother and or his temperament. Playing online games provided him temporarily safer form of relaxation than other activities (work, shopping and looking after the property). The psychotherapy was therefore not only focused on the symptom, addictive behaviour on the Internet, but we also worked with the basic approach of the client to himself and to the world. Client schizoid personality structure corresponds to the structure of personality, for which is typical defence mechanism of isolation or a withdrawal from the world, the uncertainty in interpersonal relationships, which can be compensated by a focus on performance area. We can therefore speculate that with schizoid features may be personality structure frequently represented among persons with addictive behaviour to the Internet.

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6. General discussion

This dissertation is a compilation of qualitative and quantitative approach to the topic of addictive behaviour on the Internet. Its overall aim is to study the addictive behaviour on the Internet on three different levels: general population level (quantitative approach), and some of the results of this study are more described on a group level and an individual level (qualitative approach). First paper (study I.) is a quantitative study which deals with addictive behaviour on the Internet on the general level by providing its prevalence in the general population in the Czech Republic and compares some of the results with those in Chile and Sweden. The second paper (study II.) is a qualitative study which maps motivation of addictive behaviour on the Internet in the group of MMORPG players and the third article (study III.) is a case study of the development of addictive behaviour on the Internet and its treatment. Each of the papers as well brings different time perspectives of this topic. While the first study monitors the addictive behaviour on the Internet in one actual time period, the second study deals with wider time perspective of playing online games and provides some dynamics regarding motivation for playing online games and motivation for limiting online games. The third paper deals not only with the dynamics of addictive behaviour alone but puts it in the context of the life story of the individual.

6.1. Prevalence of addictive behaviour on the Internet in the Czech Republic

Study I provides the results of general population survey in the Czech Republic. Regarding addictive behaviour on the Internet in general population 3.7% of Internet users were at risk and a total of 3.4% could be described as having developed addictive behaviour, giving a total of 7.1%, which is a quite high number of risky Internet users. The prevalence of addictive behaviour on the Internet in the Czech Republic in the general population is somewhat higher in comparison to other prevalence surveys (e.g. Aboujaoude et al., 2006; Bakken et al., 2009). This may be due to the methodological inconsistency of the definition and the criteria used to measure addictive behaviour on the Internet, which is typical for this phenomenon as was mentioned in the theoretical background (Yang & Tung, 2007). The highest prevalence of addictive behaviour on the Internet is among younger population, particularly students (Bakken et al., 2009; Soule et al., 2003; Widyanto & Griffiths, 2006) and findings from the first study confirm this fact. The lowest age group, which included young adolescents aged 12 – 15 years, showed the highest incidence of Internet users endangered by addictive behaviour (7%) as well as of individuals with developed addictive behaviour on the Internet (8%). In contrast, the prevalence of addictive behaviour in the eldest group in this research (respondents aged 50 or over) was the lowest (1.4%), so it can be said, that the prevalence of addictive behaviour on the Internet is negatively correlated with age. Similar trend can be seen among behavioural addictions in general where prevalence is the highest in the young age categories (Grant et al., 2010).

Higher prevalence of addictive behaviour among younger age group corresponds with the study II, where majority of participants belonged to the age category (15 – 35 years). The client whose life history and the process of the treatment are described in article III sought the treatment because of excessive playing of MMOG at the age of 35 and therefore is not the typical representative of this group. Although I have worked with some adolescents showing the symptoms of addictive behaviour on the Internet, finally I have chosen this client for this study because he stayed in the treatment for three years unlike adolescent players who dropped out from the contact prematurely after a few sessions. It could be supposed that adolescents usually do not seek help on their own and more often the help seeking is initiated by their parent's decisions. It could be partly explained by the fact that young people may have tendency to deny the severity of mental problems in general (Rickwood et al., 2007), especially if this problem is connected with pleasant activity such as addictive behaviour (Marlatt et al., 1997).

6.2. Online activities with addictive potential

The results of the first study indicated that the highest correlations with the addiction score were found in the following activities on the Internet: discussing online, downloading/listening music/video, chat rooms, instant messaging and online games. This partly corresponds with theoretical assumptions that there are three basic types of addictive online activities in scientific literature: online gaming, excessive online communication and cybersex activity overload (Šmahel et al., 2009). The last activity was partly covered in the questionnaire in the item watching pornographic sites and this activity was not in strong correlation with addictive behaviour on the Internet in general

population but interestingly there was the highest correlation with addictive behaviour in comparison to other online activities in the category 20-26 years. This could be due to the fact that this addictive activity is not so prevalent in general and is connected specifically with age, but partly it could as well be due to the fact that people did not admit this activity in the face to face survey because of its sensitive nature. In accordance with the theoretical background of addictive behaviours all mentioned activities bring satisfaction and therefore have addictive potential (Marks, 1990). Study II and study III more deeply focus on one particular part of addictive activities: playing online games.

6.3. Motivation for playing online games

The second study focused on motivation for playing online games and for limiting playing online games. Players provided the following motivations for playing: relaxation, self-realization, social contact and coping with boredom. The discovered motives were also found in analogous or similar studies mapping this subject conducted abroad (Bartle, 1996; Hsu et al., 2009; Yee, 2006a, b; Wan & Chiou, 2006a, b). Within the self-realization motive, players listed a completely new sub motive – playing online games with a goal of professional growth and the possibility of making a living in this or a similar area. Another finding is that the motivation for playing is dynamic and gradually changes for individual players. The motives which attract players to the game and are prevalent in the beginning of their “gaming careers” are not the same as the motives for playing online games later. These findings are consistent with data provided by the third study when the motivation of the client had a dynamic character as well. He started to play in order to relax from problems at work (relaxation), and because he wanted to understand the principle of the game (immersion in the game). But

then continued in the game mainly because of other players, with whom he created quite a close online relationship (social contact). This corresponds with the literature, where the motives which correlate more with addictive behaviour are escapism (relaxation), achievement and socializing (Achab et al., 2011; Yee, 2006a; Zanetta Dauriat et al., 2011). The motive of immersion in game is not mentioned but could be connected with the motive of relaxation (escapism). The player relaxes with immersion in the game. This is in accordance with Billieux et al. (2012) who postulate that the addictive use of MMOGs most often results in either an uncontrolled drive to look for achievement in the game which is rather the case of the younger players or a maladaptive strategy used to cope with negative emotions (e.g. depression, anxiety or boredom) which is rather the case of older individuals as was the case of client described in paper III. Billieux et al. (2012) supports the latter hypothesis by the fact that the relaxation motive is not related to actual in-game behaviour, as well as by the progression indexes in the longitudinal analysis that imply that escapees play to be immersed in a virtual reality more than to reach specific objectives in the game. Chou & Ting (2003) study results confirm the fact that in-game immersion was associated with addiction.

Some motives for online playing are similar to motives for other addictive behaviours especially motives connected to escape, arousal and relaxation (Black et al., 2007; Lemon, 2002; Lostutter et al., 2002).

6.4. Motivation for limiting online games

Motives for limiting the amount of time spent playing an online game listed by participants in study II were grouped in four categories: realizing one's absorption in the game, health reasons, impulses from the environment and

impulses from the game. No studies mapping the motives for limiting online gaming were found in available literature. The motives listed above may be divided into motives which are related to a possible addiction to online games (realizing one's absorption in the game, health reasons, negative impulses from the environment) and motives which are not related to potential addictive behaviour (positive impulses from the environment and impulses from the game). This is in accordance with the data in the case study described in the paper III. The client decided to limit online gaming because of arguments with his wife (negative impulse from the environment) and later also finally terminated online gaming because of conflicts in the game itself (impulse of the game). Repeated conflicts with his wife were also the main motive to seek out professional help, though he himself thought that the addictive behaviour was not such a serious problem. This also confirms the conclusion from study II that respondents who exhibited signs of addiction to the Internet or risk factors of such addiction mentioned limiting online gaming due to the external motives more frequently than internal motives. This is in accordance with a theoretical presumption of the trans-theoretical model of Prochaska and DiClemente (1992), based on the premise that the primary motives for changing any behaviour are mostly of an external nature and internal motives only apply when the change needs to be maintained, including confidence in managing and keeping the change.

In the context of motives for limiting the game, players also mentioned concrete strategies for limiting online playing which were divided into two basic groups: gradual limitation online gaming and its substitution by other online applications with a "safer profile" and uninstalling the game from their computer.

Client from the case study decided to limit gradually the online gaming and his need to relax later started to fulfil with buying the real estates.

An interesting finding of the study II and III is that addictive behaviour on the Internet is of dynamic nature. It means that in some period in their online gaming career the players can suffer with serious symptoms of addictive behaviour on the Internet and during some months this can change in the non risky pattern. This may be due to the fact that addictive behaviour on the Internet does not come with such severe consequences as addiction to psychoactive substances because it does not influence physical metabolism (Hollen, 2009).

In this respect, there is an interesting fact: although most people said that they consider themselves addicted to the Internet, in most cases this realization meant nothing to them and they did not feel the need to seek professional help. This reflects the fact that individuals addicted to the Internet do not often seek professional help (Blomqvist, 2002; Vondráčková & Šmahel, 2012). The reason why the client in the case study sought the treatment were conflicts with his wife, the reason why he stayed in the therapy for such a long time could be due to the fact that during the process other problems at work or partner relationship appeared which were in some way connected with his schizoid personality organization, especially with the lack of social skills, introversion and shyness, the traits which are often in scientific literature connected with the symptoms of addictive behaviour on the Internet (e.g. Mehroof & Griffiths, 2010; Morahan-Martin & Schumacker, 2000; Yang & Tung, 2007).

6.5. Dimensions of addictive behaviour on the Internet

The questionnaire used in study I and II is a 10 item scale evaluating the basic dimensions of addictive behaviour on the Internet defined by Beard and Wolf (2001) and Griffiths (2000). The similar dimensions were described on individual level in study III. Saliency was manifested by the fact that the client spent a lot of time online, and when offline often thought about the conflicts in the game and how to move the game forward. The client calmed down and forgot about the problems at work (mood modification) when logged into the online game. The dimensions of the conflict manifested themselves in the form of quarrels with his wife, because he would neglected his family due to online gaming, but also reported internal conflicts, such as neglecting his work. The client also repeatedly tried to quit the game, but from the beginning he was always persuaded to return to the game by his online colleagues (relapse). Tolerance was partly manifested in that he needed to spend more and more time in the game, but this relation was just at the beginning but not during all his "game carrier", because as he mentioned that were alternating periods of spending too much time in the game with periods of limited time in the game which he connected to the events in the game. The client reported that he sometimes felt grumpy or irritable, if not able to be online, but he related this feeling to the fact that he promptly needed to solve some problems in the game rather than to withdrawal symptoms. He did not report any physiological withdrawal. This is partly in accordance to Pies (2009) who concludes that genuine physiological withdrawal and tolerance have not been demonstrated in controlled studies of Internet addiction and therefore confirms previous findings that addictive behaviour on the Internet together with other behavioural

addictions should be distinguished from substance addiction by the fact that it does not affect physiological side of the individual (Hollan, 2009).

These findings are in accordance with the general theory of behavioural addiction because those six aforementioned dimensions are used by Griffiths (1996) in the description of behavioural addiction in general and confirm the fact that addictive behaviour on the Internet belongs among addictive behaviours.

6.6. Limitation and recommendation for the further research

Several limitations should be considered in presented studies and these as well can serve as well challenges for future research focus.

First, in the study I were compared only two dimensions of addictive behaviour on the Internet, which cannot provide the entire picture of addictive behaviour prevalence in all three countries. In future research, cross country comparison of prevalence addictive behaviour would be very interesting and it would provide interesting data regarding the problem in the cultural context. So far just a few prevalence studies have been realized with focus on adolescent users in some European countries (Durkee et al., 2012) and college students in the USA and China (Zhang et al., 2008).

Second, the questionnaire used in study I and II has not been standardized and therefore we only suppose that it measures the addictive behaviour on the Internet. Therefore the future research is needed to verify reliability and validity of its measurement. As was mentioned in the theoretical part of this thesis there is no consistent terminology and definition of addictive behaviour on the Internet which reflects in various measurements used in prevalence studies and in various outcomes. In this regard the inclusion of Internet addiction to the DSM-V

diagnostic categories (American Psychiatric Association, 2012) is very promising because it could provide the first official diagnostic criteria.

Third, the methodology of study I. does not provide information how different online applications connected with addictive behaviour really are because simple correlations do not answer this question. Further research should answer the question how the use of exact applications influences addictive behaviour on the Internet. For example high correlations between addictive behaviour on the Internet and downloading or listening or watching music and videos online were repeatedly found, but we do not know if downloading is an application which truly implicates addictive behaviour or if it is just a characteristic which many heavy users exhibit. It would be very useful in future studies to focus on the prevalence of addictive behaviour to specific online activities and connect them with basic socio-demographic categories. Eventually to look at the different online games to which players show addictive behaviour again regarding to the basic socio-demographic categories.

Fourth, the results of study II and III could also be affected by the fact that participants in the sample were playing online game World of Warcraft and Wild Tribes, whose specific focus on adventuring and conquering could project into the types of motivations provided by players. Therefore it would be appealing to study motivation for online gaming among the players of other types of online games.

Fifth, the study II provided information that pattern on motivation changes through the time, but did not follow the specific patterns of motivation development in time. This could be as well another area for research.

As was mentioned before, there is a lack of evidence regarding motivation for limiting online gaming and therefore more research in this area is needed. Further it would be interesting to study how often and under which circumstances people showing symptoms of addictive behaviour seek out professional help, with what kind of motivation, and how long they stay the treatment. For example it would be useful to look at whether adults stay in the treatment longer than adolescents or what other characteristics are connected with duration in the treatment.

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7. Conclusion

The purpose of this thesis was to focus on addictive behaviour on the Internet from three different perspectives: general population level (prevalence of addictive behaviour in general population in the Czech Republic), group level (motivation for playing online games and limiting online games) and individual level (development of the addictive behaviour on the Internet and its treatment). Findings from all three levels and studies replenish each other and therefore provide some picture about this phenomenon. It could be concluded that addictive behaviour on the Internet belongs among other addictive behaviours, really exists in general population and can be even met in clinical practice. For a few individuals it can represent a real problem with real negative ramifications on their lives but there still is a majority of people showing temporarily in some period of their life symptoms of addictive behaviour on the Internet.