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DISERTAČNÍ PRÁCE

What makes a reasonable player: self-regulation, time perspective and habits  
in online gaming

Co tvoří rozumného hráče: seberegulace, časová perspektiva a zvyky  
v online hraní

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## **ABSTRAKT**

Práce se zabývá faktory, které ovlivňují intenzitu hraní online počítačových her typu MMORPG a přítomnost symptomů problematického užívání her. V teoretické části ukazují, že problematiku nadměrného a problematického hraní lze uchopit nejen z hlediska závislostního chování, ale také z hlediska seberegulace, časové perspektivy, analýzy činnosti a zvykového chování. Ve dvou empirických studiích založených na dotazníkovém šetření mezi převážně českými hráči MMORPG her bylo identifikováno několik faktorů, které ovlivňují to, kolik času hráč věnuje herní činnosti a to, zda jeho hraní vykazuje znaky problematického (nad)užívání hry. Prvním je časová orientace měřená Zimbardovým dotazníkem časové perspektivy (ZTPI). Druhým je zvyková regulace chování. Pro její měření byla vytvořena škála Citlivosti k Situačním Klíčům (Cues Sensitivity Scale, CSS). CSS měří nejen sílu zvyku, ale také jeho regulační kvalitu – zda zvyk vede k nadužívání (Citlivost k proherním klíčům) nebo naopak užívání omezuje (Citlivost k protiherním klíčům). Časová orientace i zvyk působí na užívání hry společně, vliv časové orientace je částečně zprostředkován právě zvykem, částečně záměrnou kontrolou herního času. Všechny měřené proměnné vykazují stabilitu v čase (měřeno v tříletém odstupu na podsouboru respondentů). Data byla zpracována statistickými metodami, převážně metodou analýzy cest. Část dat – strategie pro kontrolu herního času reportované hráči – byla zpracována kvalitativně.

## **KLÍČOVÁ SLOVA**

MMORPG, nadměrné hraní, závislostní hraní, seberegulace, časová perspektiva, ZTPI, analýza činnosti, zvyk, Cues Sensitivity Scale (CSS), strategie kontroly herního času

## **ABSTRACT**

The thesis concerns factors that affect the intensity of MMORPG playing and the gaming addiction symptoms. In the theoretical part, I discuss approaches to the excessive and problematic gaming. I argue for the shift of perspective from gaming addiction disorder toward self-regulation, time perspective, activity theory and habitual regulation. Two inventory-based studies were conducted in order to empirically verify the effect of proposed variables on MMORPG usage. First, the significant role of Time Perspective (TP), measured by Zimbardo Time Perspective Inventory (ZTPI), has been confirmed. Second, the habitual regulation had been identified to significantly affect the usage. The habits related to usage were measured by the new psychometrical tool – Cues Sensitivity Scale (CSS). TP and habits influence the usage together – the effect of TP is partially mediated through Cues Sensitivity as well as through the players' deliberate regulation of playing time. All measured variables showed stability in time (measured after three years in subset of respondents). Data was analyzed with statistical methods, mainly with Partial-Least-Squares Path-Modelling (PLS-PM). The part of the data – respondents' strategies of playing time regulation – were analyzed qualitatively.

## **KEYWORDS**

MMORPG, excessive gaming, addictive gaming, self-regulation, time perspective, ZTPI, activity theory (CHAT), habit, Cues Sensitivity Scale (CSS), playing time control strategy



“Look, I can imagine I would play Paapy all my life, all the time.”

This told me my 4-year-old son after the afternoon he played World of Warcraft character (Paapy) with his dad.

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## Introduction

Playing online computer games is a leisure activity, relating to the broad area of media use. There is a broad discussion involving scholars, policy makers and general public about popular virtual gaming worlds of massive multiplayer online role-playing games (MMORPGs). Adolescents and young adults invest a considerable amount of time into playing these games. Scientific discussion has presented a large variety of motives. There is a growing body of research emphasizing positive outcomes, which players can obtain via playing—e.g., experiencing competence, making social connections, decreasing of negative feelings, exploring new roles and identities, learning new skills (Barnett & Coulson, 2010; McGonigal, 2010; Yee, 2006a). Besides, playing activity per se produces experiences enjoyed for their own sake (Deci, 1975). Such emotions as satisfaction, enjoyment and fun have been widely regarded as the essence of play (Holbrook, Chestnut, Oliva, & Greenleaf, 1984).

On the other hand, there are many studies that emphasize the negative correlates of gaming such as physical problems (i.e., fatigue, physical pain, reducing sleep time, skipping meals), personal life problems (i.e., conflicts with friends or family, low social engagement, decreased time management skills, sacrificing hobbies), and professional/academic problems (i.e., work or school absence, deteriorated performance) and more other, e.g., declines in verbal memory performance, lower psychosocial well-being, loneliness, increased suicidal thoughts (Kuss & Griffiths, 2012). These outcomes are usually related to playing too much—excessive gaming—or gaming addiction. According to a review on Internet Gaming Addiction (Kuss & Griffiths, 2012) addicted online gamers likely represent a minority of the gaming community. Many players however perceive their playing as excessive and out of control, although they do not meet the criteria for IGA (Yee, 2006b). Hellmans et al. (2013) argued that “There is increasing evidence of persons finding it impossible to quit their online gaming habits although they would like to, often neglecting their psychological and physical health.” (p. 102). I believe that modern online games, such as MMORPGs, are tailored to be optimal objects of hedonic consumption and therefore bear the great risk of being overused. Many authors confirmed that among the media users, the MMORPG players are the most prone to develop addictive usage (Ng &

Wiemer-Hasting, 2005; Smyth, 2007; Cole & Hooley, 2013; Kuss & Griffiths, 2012). Some studies even tried to identify structural characteristics of game that seems to make playing appealing to persons who play excessively (Kuss & Griffiths, 2012). Identifying individuals who are at risk of problematic excessive use in this particular context is therefore important for focusing prevention and treatment efforts.

In my thesis I focused on online gamers—specifically MMORPG players — and I decided to **discover factors and mechanisms that enable online gamers to play reasonably** and thus with lesser risk to develop excessive use or even addictive symptoms. In the search of both positive and negative factors **I focused specifically on the habitual regulation of behavior** that is learned, stable and largely unconscious, **Zimbardo's time perspective as the personal factor** that is believed to influence self-regulation as well as the variety of behavior, **and on the strategies that players use for controlling their playing time.**

The theoretical part of my thesis (part one) begins with a brief description of MMORPGs—their history, how their playing looks like, and the main specifics of the genre within the computer games (Chapter 1.0). The main purpose of the part one is to present and discuss appropriate theoretical frameworks for excessive and problematic gaming. I began with the most usual addiction-oriented paradigm, revealing its limitations for prevention, prediction and treatment (Chapter 1.1). In the next Chapter (1.2), I presented an alternative paradigm for excessive and problematic media usage, which is the deficiency in self-regulation, and I argued for its use within the MMORPGs excessive and problematic gaming research. I discuss selected theories focusing on the individual self-regulation such as Bandura's self-efficacy theory (Chapter 1.4.1), the theory of self-control strength (Chapter 1.4.2) and Zimbardo's time perspective theory (Chapter 1.4.3). I also present the online gaming as an easily available, highly immersive, intrinsically motivated activity (Chapter 1.3). Those traits make online gaming an ideal market product, whose consumption is difficult to regulate. This position asks for broadening the unit of analysis from the individual player struggling with the self-control to the whole system of MMORPGs development, sale and consumption. In the Chapter 1.4.4, I present an analysis of MMORPG within the framework of the cultural-historical activity theory, CHAT, and I argue that the excessive consumption is in the very roots of this activity. I therefore argued that for regulating the consumption of MMORPGs, one has to take an agentive action and

use relevant mediating artifacts, through which the action can be taken. In the Chapter 1.5, I consider habitual regulation as another important factor that influences MMORPG usage and I present the conceptualization of usage habits via sensitivity to cues.

In the second part, I present two pieces of original research, which I made to (1) confirm the presumed relationships between MMORPG consumption intensity, self-regulation, time orientation and newly designed concept of sensitivity to cues that reflects the habitual regulation of gaming; (2) reveal and evaluate the strategies that players use to control their game consumption; (3) reveal how gaming patterns can develop in time in different players in respect to their habitual and conscious regulation of gaming.

Generally, my thesis' major concern is **how to promote the healthy usage of the highly immersive activity**. I reveal the importance of the habitual regulation of behavior and show some ways how habits can be influenced by conscious intentions. I thus believe that principles revealed within this thesis will be useful within as well as outside the area of online gaming.



## **1.0 What are the MMORPGs (and why they are worthy of investigation)?**

The area of interactive entertainment expands very quickly and contains a large number of genres that may differ very much. Apart from heterogenous set of traditional computer games genres (adventure games, first person shooters, RPGs, strategies etc.), there are also lots of Flash games such as Angry Birds (Rovio Entertainment Ltd.) or Facebook games like FarmVille (Zynga Inc.) that recently started to gain huge popularity. Why did I decide to focus on the one specific genre of the Massive Multiplayer Online Role-Playing Games (MMORPGs)? They are quite unique within the interactive entertainment in several ways. In the next paragraphs, I would like to show some of their specifics.

### ***1.0.1 What are the MMORPGs - the first quick glance***

MMORPGs are artificially made virtual places (usually in medieval fantasy or sci-fi style), where thousands of users interact with each other and with the virtual environment (therefore Massive Multiplayer Online) in the guise of virtual characters—avatars (therefore Role-Playing Game).

Castronova (2005) likened the one's avatar to one's car. Users drive around in these virtual worlds using an avatar in much the same way we use a car to drive around the Earth. Some avatars are better than others: faster, better looking, having more power over the environment and other avatars. Each avatar is linked to a specific player; under some circumstances avatars may be bought and sold and even stolen. Avatars have some numerical characteristics that increase during the play and they also have some wealth that usually grows as the avatar "works" in the environment (pursue the game's tasks, gather valuable items, or even speculate on the in-game market). The player cannot experience the

game world and make their actions directly but through his avatar. Therefore the avatar is a kind of an extension of player's body into a virtual space. It is natural that Player experiences avatar's attributes like his own personal attributes (Castronova, 2005).

The MMORPG worlds are available 24 hours per day and they continually change whether players are in or not. Each time the player launches the game, a computer program connects to a remote server and the world, that is only partially placed in the local computer updates to the most recent version. This ensures that each player experiences the same environment and that the player's actions matter for others (e.g., when a player picks up the Eastern egg in the certain spot in the game world, the egg vanishes and cannot be collected by other players).

The access to the MMORPG world is usually paid and requires the quick and stable Internet connection. Players usually pay a monthly fee (e.g., 12 euro) for an unlimited access within the given period.

The virtual world of most MMORPGs is carefully designed to offer great freedom (almost unlimited possibilities of what to do in the world), but at the same time to prevent the confusion in players by providing an elaborate motivational structure. Hrabec (2010) argued that user is unobtrusively directed in his playing by goals and possibilities offered by the game in the right moments.

The players usually interact with each other a lot (although it is not necessary for the gameplay) and they even form their own organizations (called guilds), which have hierarchical structure and are focused on reaching shared goals. Many players establish important friendly or even intimate relationships within the game (Yee, 2006a).

Typical user spends 20-30 hours per week inside the MMORPG world(s). According to large surveys on MMORPG users demographics (Yee, 2001; Griffiths, Davies & Chappell 2003; 2004) more than 80% of users are male. Their average age is about 26-28 years. About 40% of users are married or in a serious partnership, 20% of users have at least one child. Only about 30% of users are students, the majority has a job.

The most MMORPGs have its own currency that can be traded against dollar. The commerce flow generated by people buying and selling money and other virtual items (magic wands, armor, spaceships, etc.) amounts to at least \$30 million annually in the United States and \$100 million globally (Castronova, 2005).

## **1.0.2 The history of MMORPGs**

First MMORPGs started to emerge in the 1990's. At first, they were not very popular, probably due to their high requirements on the Internet connection and higher cost, resulting from the necessity to pay not only for the game but also regularly for the access to the gaming world (Pekárková, 2009). However, some titles launched in Asia (The Kingdom of the Winds, Lineage) gained mass popularity there and reached more than a million of subscribers. According to Castronova (2005), in December 2004, there were 19 different MMORPGs with more than 100,000 subscribers worldwide, making together almost 13 million subscribers. In the end of 2004, Blizzard's Entertainment launched World of Warcraft (WoW), the most successful MMORPG in the present history that reached in 2010 more than 10 million subscribers and made Blizzard's Entertainment the dominant player in MMORPG market (Hrabec, 2010). Lately, the number of WoW subscribers decreased to approximately 5.5 million of subscribers (<http://www.statista.com/statistics/329026/activision-blizzard-number-of-mmorpg-subscribers/>), which is probably partially due to the emergence of other well-made MMORPGs such as Star Wars: the Old Republic (SWTOR) or Guild Wars 2.

The direct antecedents of MMORPGs were **MUDs** (Multi-User Dungeons) that represent the first virtual worlds as automated, shared, persistent environments, with and through which people could interact in real time by means of virtual self (Bartle, 2010). MUDs were **text-based**, meaning that everything the characters did, saw or otherwise experienced was mediated through words. In this regard, MUDs were similar to pen-and-paper RPGs (PnP-RPGs) such as Dungeons and Dragons (Dračí Doupě is the Czech equivalent), where a small group of people (up to 10 individuals) that are physically together (in the same room), creates the shared narrative by acting through imaginary characters within the imaginary world, following the set of written rules (more about the pen-and-paper RPGs can be found in Pekárková, 2008). Bartle (2010) emphasized that the main difference between PnP-RPGs and MUDs was the greater freedom experienced in MUDs. PnP-RPG players are usually expected to participate in more or less linear story, which seemed to be impossible for MUDs players that were many and connected not directly (physically) but through the medium of computer.

The first commercial and popular MUD was Neverwinter Nights and it was closely related to the arrival of the World Wide Web in 1994. People were excited to be online and

looking for an interesting content. Playing games was the natural choice for many of Internet newbies. Despite the fact that Neverwinter Nights was able to accommodate only 500 players at the same time and was still text-based, it brought the significant economic success and sent the clear message: virtual worlds could be lucrative (Bartle, 2010).

This naturally led to further development and first **graphical virtual worlds**. The same people that created text-based MUDs were hired by computer companies to design the graphical virtual worlds. There were two main branches of development—Asian and Western. The South's Korean government decided to promote investments in Internet infrastructure, which prompted two companies to develop graphical virtual worlds. Surprisingly, both companies addressed Jake Song, the creator of the successful MUD called *Baramue Nara*, to be the world's designer. First, the Nexon's *Kingdom of the Winds* (KoW) was launched in 1996, reaching a million of subscribers. NCSoft's *Lineage* followed in 1997, picked up around four million subscribers. Both worlds were in 2½D (the camera is at such angle it gives the impression of 3D landscape but caves or bridges are not possible) and could host thousands of avatars at the same time. MMORPG genre emerged.

Meanwhile in the West, four companies were working on graphical MUDs. The first out was the 3DO's *Meridian 59* in 1996, which did not meet much success. The second out, in 1997, was *Ultima Online* (UO). Its lead designer Ralph Koster was the co-creator of the adored *LegendMUD*. The UO exceed the expectations even of their creators and reached 100,000 subscribers in its first year and eventually 250,000 in years 2001-2003. It became the first MMORPG in the West. Similarly as KoW and Lineage, UO world was presented in 2½D.

The first fully 3D MMORPG was *EverQuest*, launched in 1999 and reached almost 500,000 subscribers in its 2001-2004 heyday (Bartle, 2010). Other titles followed, but the Asian MMORPGs remained at the throne until the arrival of *World of Warcraft* (2004). *World of Warcraft* (WoW) was the first MMORPG that gained really massive popularity in the West. It reached over 10 million subscribers worldwide (the half of subscribers is from Asia) and despite the numbers of its players currently decline (as of 2016), it remains the gold standard of the MMORPG genre.

### **1.0.3 World of Warcraft —the closer look at MMORPGs**

For a closer look at MMORPGs, I will briefly present the currently most played MMORPG —World of Warcraft (WoW).

#### **Starting a play session**

Once a player installs the game on his computer, creates his account and activates it by paying the subscription, he can enter the gaming world. There are two options to pay the subscription: prepaid game cards for a selected amount of playing time, and a credit or debit card to pay on a regular basis. The fee is about 11-14 euros for a month depending on the paying option (<http://eu.battle.net/wow/en/shop/game-purchase/>). The free trial account is available, but it enables playing of no higher than level 20 character (level 100 is the current maximum) and has many features locked ([https://en.wikipedia.org/wiki/World\\_of\\_Warcraft](https://en.wikipedia.org/wiki/World_of_Warcraft)). The number of subscribers oscillates over time.

Apart from official paid servers, a player may also play the game at a free server. Those servers are usually illegal, because their maintainers use the engine developed by Blizzard's Entertainment without authorization. Free servers generally have lower capacity (may contain rather hundreds players instead of thousands and ten-thousands) and suffer from many errors (Pekárková, 2009). The total number of players on the free servers is not known.

To enter the game, the player must select a server, referred in game as a realm. Each realm acts as an individual copy of the game world. Four categories of realms are available:

- Normal – a player versus environment (PvE): the gameplay is more focused on defeating monsters and completing in-game quests. Player-versus-player fights must be consensual, and any role-playing is optional.
- PvP – an environment where open player-versus-player combat is possible and does not require players' further agreement. Anyway, a player can be attacked at any time only by the player of an opposing faction (Horde vs. Alliance).

- RP – a variant of PvE, where the roleplaying is required (e.g., players are supposed to speak only in their characters).
- RP-PvP – the realm that combines the roleplaying with the open player-versus-player combat.

Although the most realms is in English, there are also realms in few other languages. It is possible to move characters between realms and players can have characters on all realms within the region ([https://en.wikipedia.org/wiki/World\\_of\\_Warcraft](https://en.wikipedia.org/wiki/World_of_Warcraft)).

## **The gaming character —avatar**

To create a new character, the player must make several choices of different importance for later gameplay. He must choose a faction (Alliance or Horde). The Alliance and Horde are regarded as enemies and their players can attack each other in some areas even in Normal realms. Avatars from opposing factions can also perform only rudimentary communication (emoticons). Contrarily, within the same faction, avatars can speak, mail, cooperates in groups, or join guilds. Each faction offers several races to choose from (e.g., Human, Dwarf, Gnome, Night Elf within the Alliance faction; and Orc, Troll, Tauren or Undead within the Horde). Each race possesses some special qualities, begins their adventures in a specific home land and most importantly it limits a player in his class selection (such as warrior, mage, priest or hunter). The class of avatar is quite important, because it influences the way, how the avatar will cope with the challenges —will he be the frontal warrior capable of enduring a lot of damage, battling his way through melee combat, or rather agile stealthy rogue that sneaks unnoticed behind the enemy lines, or a mage capable of throwing fireballs at distance, or priest able to heal himself and other avatars and thus obliterate enemy attacks. Finally, a player must choose an avatar's gender, appearance (body build, hair, face, skin...) and name. The avatars' names are unique on each server, therefore the name is a reliable identification sign that other avatars are able to see.

Avatars live in the world, meet challenges, develop their skills, gather possession, gain reputation (see Ongoing gameplay). Avatars cannot be destroyed, only deleted by its own player on purpose. When an avatar fails in a battle or falls from a high cliff or remains underwater too long, he will “die”. It means that he is temporarily in the form of ghost until

he is resurrected by other player, by himself (it happens when the ghost avatar reaches his dead body) or by spirit healer (e.g., when the body is unreachable). By “death” the avatar does not lose his possession or level or experience points, he only will suffer a temporary penalty (few minutes of “resurrection sickness”), if he is revived by spirit healer.

One player can have up to eleven different characters related to one account at one time.

## **Ongoing gameplay**

One of the most exciting aspects of every role-playing game is the avatar’s development. In WoW, avatars develop in several ways. As avatars meet challenges set within the game —battle with monsters, fulfill quests (missions, tasks) —they acquire experience points. Once an avatar gathers certain number of experience points, he advances to higher level, which means a significant change (his numerical properties improve, he obtains new talents and skills. Besides combat skills, avatars may learn various professions such as mining, herbalism, alchemy, blacksmithing, inscription and secondary skills such as cooking, first aid, archeology and fishing. Each profession and secondary skill quality depends on the avatar’s level and the practice —the more herbs the avatar collects, the better he is in herbalism, and the more precious herbs he is able to collect. There is quite lively in-game economics around profession (raw materials and products). For practicing some professions, many materials are needed (e.g., for practicing alchemy various herbs are necessary; usually the more precious potion you want to make, the more precious herbs you need). Avatars may trade either directly or via Auction house, which functions practically the same as eBay.

As avatars live and “work” within the game, they also gather wealth. It consists of in-game money and various items, which are usually somehow useful (e.g., armor, weapon, magical scrolls and potions that give the avatar some special powers). Some items are very precious and prestigious to have, because they might be acquired only at certain places and under certain circumstances (e.g. they drop from a specific mighty monster that can be defeated only by a collaborative effort of many high-level avatars controlled by skilled players).

The other exciting activity in WoW is the world exploration. The world is quite large. There are almost 100 areas and each area consists of 10-20 smaller areas. It takes hundreds of hours to briefly visit each place in WoW. The exploration is usually smoothly managed by the game content, especially **quests**, that makes your avatar travel to areas appropriate to his level. However, some players set special challenges such as to explore the whole world with a low-level avatar.

The important places are connected with the rest of the world by various means of transport such as gryphon routes, boats, or zeppelins. The world contains several large cities and a great number of small towns, villages and camps. Those places are populated with programmed characters (non-player characters, NPCs) such as trainers, vendors, bartenders, guards, bankers, auctioneers, officers or other residents. The last two mainly ask you to do some job for them (a quest), others are useful differently. Some NPCs are there only to evoke an atmosphere. Other NPCs may be encountered in wilderness (outside of inhabited areas) and they usually represent the threat (attack the avatar when he gets close).

There is also a narrative aspect of play. The world has its own legends, history (experienced by some gamers) and current struggles, and players are encouraged to participate in their solving. Aside the main narrative, there is a large number of little stories (e.g., a wild beast threatens a village, an archeology expedition has disappeared in near mountains), in which players usually participate through quests (e.g., they are asked by villagers to slay the beast, or to find the lost expedition). Quests often create the narrative chains—fulfilling one quest enables players to attempt the second, then third and so on. Quests are important tools through which designers ensure that avatars will develop smoothly—quests provide the necessary experience, money and equipment. Doing quests in WoW is similar to having a stable and easy job—it brings relatively small but stable income with little risk and little skills needed.

## **Socializing**

Avatars can be played solitarily most of the time. However, players can group. It is quite common that players do not go through the game content alone, but with one or two close persons—a friend, a partner, a parent, or sibling (Castronova, 2005).



For some activities the cooperation between players is necessary. *Dungeons* (areas inhabited by strong NPCs called *bosses*) can be entered only by one 5-players group at the time and each player has a specific team role he or she will play (e.g., *tank* is supposed to have a strong defense and his task is to lure most of enemies on himself and thus protect *damage dealers* and give others the opportunity to make strong attacks). Similarly, the PvP versions of dungeons, *battle grounds* or *arenas* require the two groups of players that battle against themselves. The most challenging aspect of PvE play represents *raids*, the large and difficult dungeons that require the cooperation of 25 players (formerly 40 players). To form such large group and to manage it efficiently would be near to impossible without some organizational activity. Therefore, players form stable societies called *guilds*. Guilds are hierarchically organized —there are several levels of membership with defined rights (and usually also duties). Each guild has a name and rank that express how much the guild is successful in tackling the game content. The higher rank brings some benefits for its members (e.g., faster mounts, receiving more experience points).

### **1.0.4 Why to investigate MMORPGs?**

In the Introduction, I noted that MMORPG are one of the most time consuming computer games. Consider that the average player spends playing MMORPGs about 25 hours per week. It means that playing MMORPGs is probably one of the most time consuming hobbies for many people. Recent estimates by Newzoo (2012) are that there are 400 million of MMO players worldwide (<http://www.pcgamer.com/mmo-infographic/>). From the large demographic studies on MMORPG players (see e.g., Castronova, 2005; Yee, 2006b) we know that the players are mainly male (more than 80%) young adults (around 26-28 years). Castronova (2005) in his economical analysis of MMORPGs pointed out that when the significant amount of people start to create virtual products rather than real, it would have consequences for the global economics. As psychologists, we could ask what consequences it would have when the significant amount of people start to make emotional investments in the virtual rather than real world. MMORPGs seem perfect for blurring the lines between real and virtual. As Castronova (2005) noticed, a player very easily acquires “a real emotional investment in an event in the virtual world.” (e.g., when your avatar is scammed by another avatar in the game, you feel angry). He further

specified "...your emotional investment was not forced on you by the hardware or the software, rather it seemed natural and, in the end, unnoticed" (p. 45). Moreover, Castronova (2005) argued that the virtual world itself (its rules and content) has some impact on you: "Your mind, when confronted with this new place, automatically developed some desires with respect to it." (p. 45)

Hrabec (2010) referred to this fact while he talked about the motivational structure of famous MMORPG World of Warcraft. Committing the huge simplification, we can say that each thing that is within the game presented as desirable (and there are many), costs either money or time. For example a well-developed avatar can be bought (usually on eBay for dollars) or raised by hundreds and thousands of hours of playing. In either case, the saying that time is money is here shown to be plausible, because the things are usually as expensive as long they took to acquire. Castronova (2005) argued that virtual things have value that can be counted in term of dollars. They take time to acquire (the cost) and they help you do things you might want to do (the benefit) (e.g., WoW avatar with a minimum level of 90 can enter the new continent of Draenor, which is an exciting experience (the benefit); however, to raise an avatar from level 1 to level 90 takes a lot of time (the cost).

Many MMORPG users acknowledge that it is hard for them to stay away from the playing even when they would like to. On the other side, there is a lot of users for which MMORPG playing is a casual and satisfying leisure activity. This difference seems to me crucial. Do we understand well what does it constitutes? Do we know what makes the difference between excessive and casual player? Is it just the player's choice? I do not want to judge if the high investment in the virtual gaming world is good or bad for individual or society or humankind as a whole. However, I believe that users should be able to choose.

## **1.1 Excessive and problematic gaming as a symptom of an addiction and its limits**

### **1.1.1 Internet, gaming and media addiction**

Given to the fact, that the first MMORPG that gaining massive popularity (World of Warcraft) was launched into the market in 2004, research into online gaming is a relatively new area of psychological research. First studies focused mainly on describing online gaming phenomena (e.g., Duchenaut, Yee, Nickell, Moore 2006; Williams, Duchenaut, Xiong, Zang, Yee, & Nickell, 2006) and users and their motivations for play (Wang, Khoo, Liu, & Divaharan, 2008; Yee, 2006a).

However, psychological studies on Internet usage, where online gaming belongs, have started to emerge since 1990's with early focus on the negative aspects of excessive use of the Internet. Nowadays the topic of *Internet Addiction (IA)* or *Problematic Internet Use (PIU)* or more generally *Media Addiction (MA)* represent the well-established and fast-growing research field that includes many theoretical and empirical studies focused on prevalence, etiology, assessment and treatment (see systematic review articles on IA/PIU, e.g., Moreno et al. 2011; Chakraborty et al., 2010; Fu et al., 2010). I will present some of the findings about IA/PIU/MA in the next chapter, because a large amount of research on online gaming is conducted within this framework. For the sake of simplicity, I will use the most usual term IA for all of these topics.

Despite of popularity of IA as a research topic, there is no agreement on definition, etiology or even prevalence of this condition (Fu, Chan, Wong, & Yip, 2010; Chakraborty, Basu, & Kumar, 2010). According to systematic reviews, the prevalence of Internet addiction (IA) in population range wildly, from 0.9% to 38% (Chakraborty et al., 2010), respectively from 1% to 35% (Moreno et al., 2011). It seems that scientific measurement of IA is not very reliable and vary extremely in respect with the measurement method, population sample or other research conditions.

Studies on IA represent a heterogeneous group of theoretical and empirical studies. As usual for the new phenomena, many studies focus on the status of IA in psychological or psychiatric classifications. According to Senormanci, Konkan, and Sungur (2012), Goldberg in 1995 was the first researcher, who defined the IA. He used the DSM-IV criteria for substance abuse and applied them to uncontrolled Internet use. Three years later, Young concluded IA to be closest to pathological gambling (Senormanci et al., 2012), which was in DSM-IV under the heading of Impulse control, but in DSM-V it is recognized as Addictive disorder (DSM-V). Nowadays, scholars are not much further in the matter of IA conceptualization (Chakraborty et al., 2010; Fu et al., 2010). There are many IA definitions, but none is empirically validated (Chakraborty et al., 2010). However, investigators seem to agree that IA involves **problematic computer usage that is time-consuming and causes distress or impairs functioning in important life domains** (Chakraborty et al., 2010). Proposed diagnostic criteria varied widely, developing both initial branches —substance abuse and pathological gambling (respectively impulse control disorder).

The recurring criticism against considering IA as a stand-alone psychiatric disorder is the high comorbidity with other psychopathological conditions – e.g., attention-deficit hyperactivity disorder, depressive symptoms, anxiety disorder and more (Chakraborty et al., 2010). A recent study conducted by Fu et al. (2010) however confirmed the discriminant validity of IA, while it measured IA (with Young’s Internet Addiction Test — Young, 1998) alongside with depression, anxiety, hopelessness, suicidal ideation and irrationality.

For the case of Internet Gaming Addiction (IGA), the situation isn’t much clearer. Kuss and Griffiths (2012) analyzed seven studies focused on classification and assessment of IGA and stated that in each of these studies, different terminology and measures were applied for similar phenomena. The problematic aspect of measuring IGA is that it is not easy to differentiate addiction from the high engagement, which is in online gaming present rather as rule than as an exception (Charlton, 2002; Charlton & Danforth, 2007). In the next paragraph, I will define the difference between excessive and addictive gaming.

### **1.1.2 Excessive vs. Addictive gaming**

Both terms often overlap and *problematic (addictive)* gaming is the one more usually used. Griffiths (2010) claimed that gaming addiction should not be characterized by the amount of time spent playing but rather by the extent to which excessive gaming impacts negatively on other areas of the gamers' lives. This seems to be consistent opinion within the online gaming research community —e.g., Lemmens, Valkenburg, and Peter (2009) argued that “The main difference between excessive and pathological gaming is that excessive gaming reflects behavior that is disproportionate but not necessarily problematic, whereas pathological gaming is defined as the persistent inability to control excessive gaming habits despite associated with social or emotional problems”.

It has been repeatedly documented in the Internet users that low-time users are less likely to be addicted to the Internet than heavier users (Fu et al., 2010; Young, 1998; Dowling ,& Quirk, 2009). Excessive gaming bears a risk to evolve into problematic gaming. There seems to be two crucial factors constituting the difference between excessive but non-problematic and problematic gaming. The first one is external (contextual, more on the site of situation) and it refers to (probably rather unusual) individual situation when a player has unlimited time he can spend playing and everybody is happy about it and therefore no problems from excessive gaming emerge. The second one is internal (more on the side of individual) and it is the player's ability to control the excessive gaming when it causes (or could cause) some problems.

The illustrative example is shown in Griffiths' (2010) case study describing the self-admitted excessive gamer, Dave, who deliberately played the online MMORPG World of Warcraft for 10-14 hours per day because simply he had nothing else to do. He was 21 year-old, unemployed, just finished his college, had no friends or a girlfriend to spend time with. The online gaming gave him daily routine, social contact, self-esteem. Probably we could argue that instead of gaming so much, he could engage in other (maybe more socially or individually beneficial activities – e.g., to be a volunteer in a hospital or study foreign language), but the important thing is that when Dave found a job and started a romantic relationship, he decreased his playing time greatly just because he simply “didn't have time to play [World of Warcraft] very much”. Dave was able to control his playing and adapt it accordingly to situational needs. The player that fails in such regulation when required, develops a problematic (addictive) playing. I believe that many factors of

problematic (addictive) playing identified in other studies (see above) can be interpreted as factors that disable player's control over gaming.

The case of Dave presented above shows an optimistic scenario. Although Dave did not need to control his playing for some months and played excessively, he was able to regulate gaming quickly and effectively when his situation changed. Such abrupt changes in life situation—requiring the adaptation of time spending—are quite often, especially in the adolescence, when new time-consuming challenges appear (e.g., college, the first work or first romantic relationships). I believe that players should be encouraged to regulate their gaming even when they do not perceive any external restrictions (they have plenty time to spend gaming). They would be then prepared to change their playing significantly when needed. In the next chapters, I will suggest that this control of gaming bears many difficulties, mainly because of the nature of the online gaming and its interaction with the self-regulation mechanisms.

### ***1.1.3 Etiology of IA and media consumption***

Many attempts have been made to understand the etiology of IA (or behavioral addictions generally). There are some promising biological findings – e.g., Internet addicts to have shorter alleles in their serotonin-carrying genes and higher scores of harm avoidance and depression compared to control group (Lee et al., 2008 In Senormanci et al., 2012).

According to LaRose, Lin, and Eastin (2003), who focused on the media addiction, there are two predominant views on the development of addictive consumption. One branch of theories attributed the addiction development to the addictive personality, the second branch of theories explains the addiction through the operant conditioning processes.

The addictive personality model is supported by findings that there is comorbidity between Internet addiction and other psychopathological conditions (Chakraborty et al., 2010). Moreover, there have been found moderate-to-high correlations among various types of media addictions —e.g., television, Internet, and video games, and low-to-moderate correlations between media and alcohol addictions (Greenberg, Lewis, & Dodd, 1999). On the other hand, Finn (1992) found that marijuana and alcohol addictions

correlated negatively with television consumption, suggesting that there is no common underlying personality syndrome. Marlatt, Baer, Donovan, and Kivlahan (1988) pointed out that some personality correlates such as depression and low self-esteem appeared to be the consequences of addiction as much as their cause.

According to Kuss and Griffiths (2012), the personality of gamers has been investigated within twelve studies. Following traits were found to be significantly related to IGA: avoidant and schizoid interpersonal tendencies, loneliness and introversion, social inhibition, aggression and hostility, boredom inclination, sensation-seeking, diminished self-control, low self-esteem, neuroticism, state and trait anxiety, low emotional intelligence, low self-efficacy in the real life as opposed to high self-efficacy in the virtual world. Similarly to LaRose et al. (2003), Kuss and Griffiths (2012) caution against the automatic acceptance of these traits as etiological entities, because they may not be unique to IGA.

Other potential etiological factor close to personality is the players's motivation. Several studies (for review see Kuss & Griffiths, 2012) documented that IGA is related to various motivations such as coping with negative emotions, stress, fear and escape, virtual friendship/relationship, entertainment, playfulness, empowerment, mastery, control, recognition, completion, excitement and challenge, curiosity and obligation, immersion, high intrinsic motivation to play as opposed to extrinsic motivation. Many of these motives seem quite usual and the same objection can be raised about the etiological significance of these motives as in the previous case of personality traits.

The obvious deficiency of presented findings is in the correlation design of the reported studies. Because they do not explain the mechanisms of the addiction formation, but merely search for its correlates, and their etiological significance is limited.

The operant conditioning model of addiction (Marks, 1990; Marlatt et al., 1988) is often cited by media addiction researchers (Brenner, 1997; Davis, 2001; Griffiths, 1995; 1999; Putnam, 2000; Smith, 1986; Young, 1999). According to this model, the consumption behavior progresses in four phases: initiation, transition to ongoing use, addiction, and behavioral change (Marlatt et al., 1988). Various mechanisms related to habitual or consciously controlled behavior operate in each phase.

In the initial phase, the consumption is experienced as pleasurable and rewarding. Although the genetical dispositions and family history can influence the experimentation

and initial reactions, **the social and personal outcomes of the behavior play the important role**. While the consumption of the activity brings the benefits to an individual, it is probable that he or she will continue the consumption. This is a well-known mechanism proposed within the framework of operant conditioning. In the Chapter 1.3, I will show that online gaming bears many benefits, one of the most important is the experience of flow, which I will discuss in detail. According to LaRose et al. (2003), at this point the consumption could begin to become habitual in the sense of being automatic or ritualistic while remaining consistent with conscious self-interest.

Marlatt et al. (1988) stated that the transition to problematic usage **can begin if the behavior acts as an important or exclusive mechanism to relieve stress, loneliness, depression, or anxiety**. This is very important conclusion that should be carefully verified empirically. It is probable that for many users the gaming functions as a mechanism to relieve stress, loneliness, depression, and anxiety to some extent. In the case of online gaming this effect of emotional regulation results from the essential features of the activity (see Chapter 1.3 Flow). Without any further specification, it means that every consumer can start to produce problematic consumption.

When the problematic media usage becomes **excessive**, it causes various life problems, confrontations with significant others, and **the inability to stop media consumption once started**. As pointed out by Marks (1990), the syndromes that are common either in substance abuse or in behavioral addictions are **disorders of impulse control and self-regulation** (p. 1389). Anyway, there is an important question, whether the impulse control and self-regulation disorder is the consequence or the source of the excessive consumption. The transition phase between unproblematic and problematic usage is marked by some symptoms — the diminished response to the consumption (tolerance), withdrawal symptoms in its absence, narrowing of the addictive repertoire (e.g., more time spent playing MMORPGs, less time spent in other Internet activities), awareness of the compulsion, and relapses following periods of abstinence (Marlatt et al., 1988).

After the shift toward addictive consumption, various problems that emerged (e.g., confrontations with close persons, the lack of sleep or the lack of time dedicated to succeed in school, work or other domain) usually lead to increased consumption of the game. Some researchers claim that in this state only the professional help can abort the addictive



behavior (Marks, 1990). Others show that also self-initiated change of addictive behavior is possible under certain circumstances (Prochaska, DiClemente, & Norcross, 1992; LaRose et al., 2003). I will discuss this subject more in the next part dedicated to the treatment of addictions, or to the problem of behavioral change, in general.

### ***1.1.4 Treatment of addictive behavior —the problem of behavioral change***

Brickman et al. (1982) differentiate four conceptual approaches to understand addictive behavior via the two questions: 1) to what extent is the person responsible for the development of addiction, 2) to what extent is the person responsible for solving the problem. The resulting four models are:

A) moral model (a person is responsible both for the development and for the treatment of addiction);

B) medical/disease model (a person is not responsible either for the development of for the treatment, because addiction is the condition he or she cannot influence with own sources);

C) enlightenment model (a person is responsible for the development of addiction but he or she is incapable to change the condition without the help of higher power);

D) compensatory model (a person is not held responsible for etiology but the treatment is considered to be the personal responsibility)

The most advantageous model for the addiction treatment seems to be the compensatory model, in which the addiction can be understood as a learned adaptive or functional behavior in the context of personal and environmental factors. Compared to the dominant medical/disease model, such conceptualization of addiction is better able to explain the self-initiated change of addictive behaviors (what a person learned, a person can also unlearn, especially when the context changes and the learned behavior is no more adaptive and functional). It also attempts to study similarities across addictive behaviors. Learning factors such as classical and operant conditioning, observational and social learning and higher cognitive processes (beliefs, expectations etc.) are considered to be

common to all forms of addictions (Marlatt et al., 1988). Therefore, LaRose et al. (2003) proposed to reconceptualize the addictive behavior via Bandura's social-cognitive theory of self-regulation, which I will discuss later.

## 1.2 Excessive gaming as a deficit in self-regulation

The self-regulation problem is sometimes mentioned within addiction-oriented paradigm. According to Fu et al. (2010), Internet addiction concerns specifically young people, who depend heavily on the Internet for learning, social activities and leisure and, at the same time, they appear to be less self-regulative and more susceptible to media influences.

Chou and Ting (2003) argued that the consumer habit is an important key to a repetitive consumption, and it has a moderate effect upon addiction. LaRose et al. (2003) claimed, that **habit is a necessary component of the media addiction**. Addiction may be defined as “a repetitive habit pattern that increases the risk of disease and/or associated personal and social problems...often experienced subjectively as “loss of control” [that] continues despite volitional attempts to abstain or moderate use” (Marlatt et al., 1988, p. 224). That means that **addiction is a habit that can not be easily changed**, which is essentially the same as I stated in the Chapter Excessive vs. Addictive gaming. LaRose et al. (2003) also show that many symptoms usually attributed to addictive consumption are in fact symptoms of deficient self-regulation that induces the habit formation, leading to excessive and uncontrolled consumption. Both variables —deficient self-regulation and the habit strength were empirically proven to correlate moderately with the Internet usage (LaRose et al., 2003).

Liu and Peng (2009) claimed that signs of deficient self-regulation are often observed in MMOG players. They believe that players may fail in tracking the time spent during one session and they may have difficulties to reduce the playing time even when they have realized that too much gaming negatively influences their other activities. In their empirical study, the deficient self-regulation was found to be a significant predictor of various life problems connected with online gaming.

### **1.2.1 Social-cognitive theory of habit (repetitive use) formation**

LaRose et al. (2003) pointed out that the habit is believed either to be a result of cognitive processes (Rosenstein and Grant, 1997) and willful acts (Rubin, 1984; Stone and Stone, 1990), or to develop separately and even in opposition to conscious decision making (Aarts, Verplanken, & van Knippenberg, 1998; Landis, Triandis, & Adamopoulos, 1978; Metcalfe & Mischel, 1999; Ouellette & Wood, 1998).

LaRose et al. (2003) claim that repetitive media behavior may develop as a conditioned response to dysphoric mood states. I believe that there are many more learned cues (or conditions) that induce the repetitive media consumption behavior (see the Chapter 1.5). LaRose et al. (2003) emphasize the role of dysphoric mood probably due to the influence of the dysphoric mood on cognitive processes responsible for effective self-regulation (see Chapter 1.4.2). Media consumption behavior therefore takes place when the person is vulnerable to act habitually (as opposed to consciously, deliberately). Because the habitual regulation of behavior takes place very often, it would mean that people would very often start the media consumption. In the Chapter 1.3 “**Immersion and Flow**”, I will show that there are also reasons, why people often are not able to stop consumption. Within the immersive activities, the self-monitoring processes are always somehow weakened, which can lead to insufficient self-regulation. Each repetition of consumption behavior strengthens the habit and the likelihood of future usage (Landis et al., 1978). In the rational theories of addiction, people seek the repetition of the activity consciously, because it gives them desired and expected outcomes. LaRose et al. (2003) pointed out that the role of the conscious decision gradually fades as the mind tries to economize on the mental effort invested in executing of repetitive behaviors. Barth and Gollwitzer (1994) found out that the conscious thoughts that initially led to the activity became less available to explicit memory. As this happens the behavior becomes automatic rather than controlled. **The habit formation is accompanied by decreased attention to self-monitoring** (important mechanism in self-regulation, see Chapter 1.4.1). Consequently, it is less likely that the behavior will be consciously moderated by applying the conscious self-reactive incentives (incentives developed by a person in order to regulate one’s own inner states). “Unregulated” habitual use (operantly conditioned through incentives that are no longer actively attended to) is opposed to “regulated” intentional uses (motivated by active

consideration of gratification expectations). Therefore, as habit strength grows, the conscious control weakens. (LaRose et al., 2003)

It should be noted that LaRose et al. (2003) identify only one factor that influences the probability if a person develops or does not develop the habit, which is whether a person uses the media to relieve dysphoric mood (self-reactive outcome expectations). **tThe mechanism of replacing the conscious control with the habitual regulation is presented as natural and general.** However, LaRose et al. (2003) admit that “some users, however, may still monitor and moderate their overall media consumption by comparing it with personal or social norms” (p. 234).

LaRose et al. (2003) made a great step forward while they reinterpreted the excessive media usage as the habitual usage rather than addictive usage.

In the next chapters, I will try to reveal some individual or activity-specific factors that positively or negatively influence the ability to maintain the conscious self-regulation in the immersive and intrinsically motivated activities such as online gaming. I will also further discuss the concept of habitual regulation and its possible roles in online games consumption.

## 1.3 Immersion and Flow

Before I will analyze the process of self-regulation, I will briefly analyze the nature of online gaming as the immersive and intrinsically motivated activity, because I believe this is necessary to take into account while thinking about the self-regulation in game consumption.

Huizinga (2000), a famous game theoretician, refers to play as a free activity, which stands outside ordinary life and although it is not “serious”, it is intensely and utterly absorbing. Today modern-media (such as computer or Internet) game researchers often describe games as highly immersive. McMahan (2003) understand the “**immersion**” as a usual phenomenon connected with human-computer interaction. According to Murray (1997) the experience of immersion is medium-independent and develops when brain tunes into story with an intensity that can obliterate the world around us. Immersion as a psychological experience is the sensation of being surrounded by a completely different reality that takes over all of our attention, our whole perceptual apparatus. It is a psychological parallel to diving (physical immersion in water). In a participatory medium (e.g., computer game), immersion implies learning to “swim”, to do things that the new environment makes possible. As pointed out by Murray (1997) the experience of being transported to an elaborately simulated place is pleasurable in itself, regardless of the fantasy content.

Castronova (2005) emphasized the “immersive power” of MMORPG worlds: “Frankly, I fear the power of simulated world to alter the mind’s conception of its own desires. Many people seem to become heavily invested emotionally in the rather crude synthetic worlds we already have, and some spend almost every waking hour there. Is that a result of a rational choice, or rather of some form of a chemical response treadmill similar to nicotine? Many of these worlds are designed to utterly and completely enclose the user’s consciousness in an envelope of the coder’s design.” (p.24)

### **1.3.1 Flow experience in gaming**

A similar concept to immersion, which is often concerned with computer games, is **flow**. Flow is a mental state introduced by Csikszentmihalyi (1975) and described as “the holistic experience that people feel when they act with total involvement” (p. 36). Csikszentmihalyi formulated the flow concept on the basis of detailed interviews with professional and amateurs from various domains (e.g., chess players, surgeons, dancers, rock climbers etc.). Respondents often reported a special feeling while engaging in the activity, which they praised highly and which has some common characteristics across different activities. Respondents described it usually as “being in the midst of flow” or “flowing from one moment to next”. For all respondents, the flow was an enjoying experience. They confessed that while in the state of flow, they enjoy their work (even if it is hard) and enjoy doing it nonstop, sometimes for long periods, taking risks, getting very tired, sometimes exhausted. They felt that they had been performing to the utmost. The flow state has been labeled as *optimal experience*.

Csikszentmihalyi (1990) characterized the flow experience by nine main traits:

- (1) clear and distinct goals;
- (2) temporary loss of self-consciousness;
- (3) distorted sense of time;
- (4) actions merging with awareness;
- (5) immediate feedback;
- (6) high concentration on the task;
- (7) high level of control;
- (8) balance (precise matching) between the available skills and challenges;
- (9) experience brings full satisfaction and is worth doing for its own sake (*autotelic* —it does not require external motivation)

Some of these characteristics (namely 1, 5, 7 and 8) are also conditions that must be present in the activity to generate the flow experience. Thus experiencing flow is more likely in those activities that meets following criteria: the activity defines clear goals, the activity provides feedback, the activity enables control, the activity requires particular skill

(Hrabec and Chrzą, 2015). **In online gaming, all named criteria are met because the games are created to meet them.** The frequent experiencing of flow is believed to be a crucial factor that forms the consumers' loyalty to certain game title - "According to flow theory, when somebody is in the state of flow, he/she wants to maintain the state. Therefore we believe that if somebody experiences the flow state more often while playing an online game, he/she will have higher customer loyalty to the game" (Choi & Kim, 2004). **Many authors regard the flow experience as a key factor in repetitive consumption behavior in various cyberspaces (e.g., Hofman & Novak, 1996; Novak & Hofman, 1997) and even a direct cause of addictive consumption of cyber-games (Chou & Ting, 2003), although this is theoretically not very plausible in regard to psychologically opposed nature of both processes —flow and addiction (Voiskounsky, 2008). On the other hand, it is easy to imagine that the flow state undermines the self-regulation capability of the consumers. As said before, the insufficient self-regulation makes space for creating the habitual use, which may lead to addiction.**

Which are the characteristics that accompanied the flow experience and its relations to self-regulation processes described above? In the social cognitive theory of self-regulation, the self-monitoring is the most important mechanism that motivates us to change behavior that does not meet our standards. The self-monitoring however requires the strong awareness of self, which is in the flow experience diminished. The principle of flow is in fact to *forget about yourself* (see flow characteristics 2 and 4) and to *forget about your environment* (characteristics 3 and 6). The only thing that matters is the ongoing activity. The loss of self-consciousness is temporary, however the distortion of time perception can make the monitoring difficult (even the retrospective monitoring process). Thus the gamers may have feeling that they played a little, but objectively their session was much longer.

The flow state is argued to have some positive outcomes such as the autotelic experience and positive affect (Chen, 2000). Also Holbrook et al. (1984) in their analysis of play as a consumption experience emphasized the positive affect or the feelings of satisfaction as a main outcomes of intrinsically motivated behavior (which flow experience definitely is).



I believe that **the online games are tailored as ideal products to pleasurable consumption**. However this feature is for many players a source of both trouble and satisfaction, because the consumption might be difficult to regulate.

Put together with the previous chapter, we can sum up that the players are usually strongly motivated to repetitive usage of online games, which leads to replacing the conscious planned and regulated use with the habitual use.

## **1.4 The self-regulation in different frameworks**

There are three levels of behavioral regulation: the instinctive regulation, the habitual regulation and the conscious regulation.

In the previous chapter on the nature of online gaming, we showed that the instincts lead us to play as much as possible, to gain the pleasure and to experience the flow.

In human, the conscious regulation is superior and able to control the lower forms of regulation. Although the role of habit in online games consumption is the main concern of my thesis, I also discuss some theories of conscious self-regulation in order to answer questions like *How to consciously regulate the game consumption? Is it even possible to do it and under what circumstances?*

We can approach the conscious regulation of behavior from two very different perspectives. The first one is to focus mainly on the individual and its ability to consciously and purposely regulate his actions, which is usually called the self-regulation in the narrow sense. Those theories define factors responsible for such ability and factors that seems to diminish the ability, leading to self-regulation deficit. I will analyze in detail Bandura's social cognitive theory of self-regulation (Bandura, 1991), which is relatively close to the problem of behavioral change (see Bandura, 2005) and the conceptualization of self-control strenght by Muraven and Baumeister (2000).

The other perspective is represented by the theories emphasizing the factors on the site of the activity that should be regulated, for example the cultural-historical activity theory (CHAT). In the following paragraphs, I will go through both types of theories and I will try to apply them on the situation of self-regulation in MMORPGs consumption.

### **1.4.1 Bandura's social cognitive theory of self-regulation**

Self-regulation influences greatly human behavior. It is one's ability to direct his or her own behavior, instead of being passively affected by external influences.

One of the most prominent self-regulation theories is **Bandura's social cognitive theory** (1991). According to Bandura (1991, 2005 and elsewhere), self-regulation is a complex, multifaceted process, that works mainly through three sub-functions and corresponding stages: self-monitoring, self-judgment, and self-reaction. In the initial self-monitoring stage, a person observes his performance under various circumstances and monitors their effects. In the second self-judging stage, a person evaluates his particular performance by comparing it to personal standards or others' performances. The final self-reactive stage directly affects person's behavior. Based on the outcome of self-judgment, a person reinforces his behavior that was positively judged and avoids the behavior that led to negative self-judgment. In Bandura's social cognitive theory, self-regulation is presumed to be context dependent. It means that the having high self-regulation in one situation (e.g., work) does not guarantee having the high self-regulation in other situations (e.g., health behavior). Bandura (2005) suggested that self-regulatory skills may be exercised. In his empirical work, Bandura (1991) revealed the importance of self-efficacy belief —the cognitive factor that influences self-regulatory skills. Although there had been identified many factors that influence self-regulation in health behavior, Bandura (2005) argued that many of them overlapped and were redundant: "...after the contributions of perceived self-efficacy and self-evaluative reactions to one's health behavior are taken into account, neither intentions nor perceived behavioral control add any incremental predictiveness." (p. 247)

Bandura also emphasized the importance of future time perspective —the ability of mind to cognitively represent future events: "future events cannot be causes of present motivation and action. However, by being represented cognitively in present, conceived future events are converted into current motivators and regulators of behavior." (Bandura, 1991, p.248). From this point of view, **the future time perspective constitutes a prerequisite for self-regulation**. We will discuss time perspective theory in the Chapter 1.4.3.

### **Self-monitoring as a crucial factor for behavioral change**

Bandura hypothesized that self-regulation operates via three psychological subfunctions: self-monitoring subfunction, judgmental subfunction, and self-reactive influences.

Bandura claims that self-regulation cannot be effective if a person does not **pay adequate attention to their own performances, to conditions under which they occur, and the immediate and distal effects they produce**. To apply it simply to gaming and its regulation, a gamer which does not monitor how much he plays, and what consequences his playing usually has, would not be able to regulate his playing adequately. As put by Bandura, self-monitoring is crucial for setting the realistic goals and for evaluating their pursuing. Moreover, by analyzing the regularities in their own behavior, people can reveal some patterns and identify the psychologically important situations that lead them to behave in certain way. For those, who know how to alter their behavior and the modifiable aspects of their environment, the self-insights can set in motion a process of corrective change (Bandura, 1991, p. 250). Bandura claims that the knowledge of self is gained through the observing occurring covariations in the real time, or in the retrospective analysis, or through the personal experimentation —by systematically varying things in their daily live and noting the accompanying personal changes. Bandura here de facto claims that when people wants to change their behavior, they need to look at their usual ways of acting — their habits — to know them thoroughly and to experiment with them (to make changes in them). Bandura further emphasizes the importance of self-monitoring: “When people attend closely to their performances, they are inclined to set themselves goals of progressive improvement, even though they have not been encouraged to do so.” (Bandura, 1991, p. 251). According to Bandura, the effect of self-monitoring on the real positive change in behavior depends on two factors: 1) the relative change-resistance of the activity (some activities can be relatively hard to modify, e.g., smoking) and 2) the personal standards against which the behavior is evaluated (e.g., if smoking is perceived as a norm, the behavioral change is not probable to occur even if the smoking behavior is well monitored) The development of **personal standards** is according to Bandura the thing of judgmental subfunction. In a nutshell, the standards are transmitted by personally significant persons (e.g., parents in early childhood) via direct tuition, being models for observing and imitation. Bandura noted that people do not absorb ready-made standard, but rather construct their own under the influences mentioned above. For many activities, Bandura points out there are no norms and therefore the referential comparisons takes place. **Personal standards together with self-monitoring functions lead to self-reactive influence (the real behavioral change)**. “Neither performance knowledge without

standards nor standards without performance knowledge provides a basis for self-evaluative reactions” (Bandura, 1991, p.261).

Although Bandura in his theory did not take into account the nature of performed activity, he differentiated between simple and complex tasks and how their difference influences the self-regulation. He claimed that on simpler tasks, where the success is attainable solely by increased level of effort, self-discontent with substandard attainments is a major regulator of performance motivation (Bandura & Cervone, 1983, 1986). On complex tasks that make heavy attentional and cognitive demands, the important motivator is the self-satisfaction with progress toward challenging standards (Bandura & Jourden, 1991; Cervone, Jiwani, & Wood, 1990). In other words, more difficult the task is, more the positive feedback on own’s performance and one’s self-rewarding is needed .

**It is clear that a monitoring is the crucial process for self-regulation.** What is missing in Bandura’s theory, are the specific methods to evoke and enhance self-monitoring processes in individuals. The occurrence of the self-monitoring processes is firmly related to motivation. When we recognize the discrepancy between our standards and our behavior, it motivates us to make a corrective change (negative feedback model). The self-monitoring processes are crucial for the recognition of the discrepancy. The self-monitoring represents also the proactive process of setting new challenging goals. I believe there are serious obstacles in self-monitoring in MMORPG playing resulting mainly from the immersive nature of the activity. As described earlier, the flow experience often present during the gaming, is accompanied with the loss of self-awareness that seems to be vitally important in monitoring. It may be that many players playing too much are not even aware of it, because their self-monitoring in gaming does not work properly. It has been documented that this is quite usual in people engaging in problematic behavior such as smoking. Prochaska et al. (1992) label such people as pre-contemplators (they are not aware or under-aware of their problem) and claim that 50-60% of smokers are in this stage and therefore not motivated to corrective change.

The other factor important for efficient self-regulation is **the quality of personal standards** to which the performance should be compared. In Bandura’s theory, *standards of behavior* serve as guides and motivators. It is in agreement, for example, with the first component *standards* (ideals, goals) described by the feedback-loop model by Carver and Schreier (In Baumeister and Heatherton, 1996). Standards should be clear and consistent.

The lack of standards or conflicting incompatible standards can prevent effective self-regulation (Carver and Schreier In Baumesister and Heatherton, 1996).

Bandura (1991) emphasized that for many activities there are no generally set norms from which standards could be derived. While online gaming is a relatively new area of culture, it is probable that it is one of such activities. Therefore the referential comparison is probably the major source of the standards concerning the games consumption. The problem is that the usage is generally quite high—about 20 hours per week (Yee, 2006a) and more than 50% of consumers does not feel to have a control under the consumption (Yee, 2006a). The high and uncontrolled consumption seems to be norm in MMORPG players. Therefore I believe that many players can set their standards in this way.

Aside from the above presented processes that make self-regulation possible, Bandura discussed yet another mechanism that functions as a major determinant of self-regulation effectivity. It is the **self-efficacy mechanism** —people’s beliefs about their capabilities to exercise control over their own level of functioning and over events that affects their lives (Bandura, 1991, p.257). Self-beliefs of efficacy partly determine how the various functions of self-regulatory system operates. The self-efficacy mechanism has been also investigated in concern with the problematic media use and found to have ambivalent effect. Although self-efficacy should enhance one's self-regulative ability and thus protect him from excessive usage, it has been found that Internet self-efficacy positively affected the Internet usage (LaRose et al., 2003).

The self-efficacy has a link to the causal attribution processes —people with low self-efficacy tend to ascribe their success to external causes and their failure to internal causes and vice versa. Therefore it influences how much satisfaction a person gains from the performance, which is the important motivator of self-regulation effort. The self-efficacy also determines the aspiration level —the more capable people judge themselves to be (i.e., the higher their self-efficacy is), the higher goals they set for themselves and more firmly they attain them (Bandura, 1991),

In the search for what constitutes the different level of self-efficacy, Bandura identified the impact of beliefs about abilities. People which believe that ability is an acquirable skill that can be increased by knowledge and perfecting competencies, seek challenges and regard errors as a natural part of an acquisition process. They judge their

capabilities in terms of personal improvement rather than by comparison with others. Their self-efficacy is resilient even when performance standards were difficult to fulfill. On the contrast, people which believe that ability is a more or less inherent capacity, regard performance level as diagnostic of underlying aptitude. Errors and deficient performances carry high evaluative threat for them, therefore they prefer tasks that minimize errors and permit display of their proficiency. Their self-efficacy diminish when they encountered problems (Bandura, 1991). This difference is very important in regard to change in problematic behavior. Prochaska et al. (1992) pointed out that only a minority of people that try to change their problematic behavior (e.g., smoking) succeed for the first time. “Relapse is a rule rather than an exception in addictions” (p. 1104). Only a minority of relapsers returns to the pre-contemplation stage, the majority steps back in the contemplation or preparation stage **and learn from their recent attempt—identify their mistakes and consider different methods** (DiClemente et al., 1991). Unfortunately, there is not enough research that would explain why some people benefit from recycling and other “spin their wheels” and remain stuck in the early stages of behavioral change. The different conceptualization of ability and the incidental level of self-efficacy are promising theoretical concepts in this regard.

It is not surprising that people like to experience the self-efficacy. According to Bandura “people display enduring interest in activities at which they judge themselves to be self-efficacious and from which they derived satisfaction by mastering challenges” (p. 258). The perceived self-efficacy is a better predictor of the intrinsic interest in activity than the actual ability to perform the activity. The self-efficacy develops through the successful goal attainment. People need challenges in their life to prevent boredom, uncertainty about their capabilities and dependence on external satisfaction. This statement explained above mentioned empirically found positive relationship between Internet self-efficacy and Internet usage. **I believe that MMORPG playing can serve as a very good activity to experience the self-efficacy.** MMORPGs provide an environment full of challenges (goals) that are waiting for a player to accomplish. Goals are increasingly difficult as player's skills in gaming naturally develop<sup>1</sup>. You need no prior knowledge or skill to fulfill those goals. Moreover, you can set your own goals within the environment,

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1 “Goals and rewards in MMORPGs typically use a random-ratio reinforcement schedule based on operant conditioning. Early achievements are quick, almost instantaneous, and gradually take more and more time and effort until progression becomes almost imperceptible.” (Yee, 2006)]

that can be very challenging and satisfying —e.g., to lead a successful guild (organized group of people of different sizes —from tens to hundreds members); to collect the most valuable and rare game items ; to create a functional business (there is an auction house, where players trade game items for game money). The variety of goals is huge in MMORPGs. Besides, there is usually an elaborate support for the game goals achievements —e.g., World of Warcraft players can use the official website ([www.wowhead.com](http://www.wowhead.com)) full of guidelines for every aspect of play; similar but fan-made website wowwiki (<http://wowwiki.wikia.com>), which is by the way the second largest user-contributed wiki (online database of information) after the Wikipedia itself (McGonigal,2010); various online forums etc. This is a brilliant move from the WoW creators —the goals achievement is usually relatively smooth and when a problem occurs, they don't give you a ready solution, but a lot of help to overcome it by yourself instead.

It is a question, if there is a general level of self-efficacy or if there's specific self-efficacy related to various activities, in which a person engages. A daringly optimistic idea is that **people consuming games , build gradually their personal efficacy, which enables them later to regulate the consumption.** Alternatively, the self-efficacy in gaming has no link with the self-efficacy in the game consumption regulation. Nevertheless, it is probable that the experience of self-efficacy gained by playing is a strong motivator to play.

I believe there is a psychological concept that reflects the different levels of general self-efficacy:Zimbardo's time perspective factors. I will analyze Zimbardo's time perspective theory in the Chapter 1.4.3.

### ***1.4.2 Self-control - the final stage of self-regulation***

Muraven and Baumeister (2000) focused on the final stage of self-regulation, self-control (in Bandura's terminology self-reaction). It consists of processes aimed at reducing discrepancies between standards and perceived actual state of self. People exert self-control to exert control over their responses rather than allowing them to proceed in their normal (instinctive) or automatic fashion. According to Muraven and Baumeister (2000), people try to maximize the long-term best interests of the individual through self-control. In this



regard self-control in fact overlaps with the whole self-regulation as well as with the future temporal orientation (see Chapter 1.4.3).

Muraven and Baumeister (2000) propose that for exerting self-control, the special kind of resource is needed, which may be called self-control strength (SCS). Authors argued that people have developed mental and behavioral habits characterized by a certain strength. Stronger the habit is, the more it is resistant to change, and thus more SCS is needed to override it. There are several main assumptions related to self-control strength theory (Muraven & Baumeister, 2000):

First, SCS is necessary for all executive actions of self (e.g., initiating and interrupting behavior, making decisions).

Second, SCS is a limited resource in the sense that people can override only a finite number of urges at the same time;

Third, SCS is general, all self-control operations draw from the same resource;

Fourth, the success or failure of self-control depends on the person's level of SCS; people with more SCS should be more likely to reach a self-control goal; the lack of SCS will result in breakdown of self-control;

Fifth, after the exertion SCS, the resource is depleted, which may result to self-control fail in the subsequent self-control action; it is different from other resources such as working memory, which is also limited, but not depleted after use. The depletion is not permanent, it is regained by resting.

Self-control strength is therefore similar to muscle functioning. Authors presume that SCS reservoir might be gradually increased by frequent exercising followed by opportunities for a full rest.

## **Aftereffects of Stress coping and Mood regulation**

The most important hypothesis resulting from the theory of self-control strength is that after the initial self-control effort, subsequent self-control attempts should be more likely to fail, because SCS would be depleted for some period until replenishment. Two factors are usually supposed to require (and thus depletes) self-control strength: coping with stress and dealing with negative emotions.

Coping with stress is often used as the primary task for self-control. Common stressors used in experimental conditions are uncontrollable or unpredictable noise, uncontrollable crowding, or uncontrollable bad odors. Coping with stress is also known to be connected with relapses of smoking, drinking and diet breaking.

Mood regulation is another factor commonly agreed to deplete SCS. According to Muraven and Baumeister (2000), people usually don't want to remain in aversive emotional states for long periods of time and try to feel better and thus it is probable they exert SCS. There has been experimentally confirmed that inducing a bad mood (e.g., by task with unsolvable puzzles) led to increased eating in dieters (compared with non-dieters and dieters with normal mood). Similarly, children in a bad mood are less able to delay gratification compared with children in neutral or happy mood. Negative feelings were found to relate to relapses among smoking-quitters, people trying to quit alcohol drinking and heroin addicts (Baumeister and Muraven, 2000). It seems that the effect of negative feeling on self-control is mediated through the effort to regulate aversive emotions. Muraven et al. (1998) conducted a study, where participants were exposed to a distressing, sad video clip. One group of participants were asked to control and stifle their emotional responses, the second group to amplify them, and the people in the control group were told not to alter their emotional states. Both groups instructed to regulate emotions showed a lower performance in a subsequent self-control task (physical endurance on hand-grip) compared to the participants in control group.

The most pronounced difference from Bandura's theory is that theory of self-control strength assumes SCS to be general – people have the same reservoir of SCS for self-control task in many areas (dieting, delaying gratification, smoking etc.). Bandura conversely assumed that the individual may express various levels of self-regulation in different areas.

### **Self-licensing as the complement of self-control strength theory**

To add more complexity to the theory of self-control strength, I will briefly present the concept of self-licensing that has been recently considered as a factor important in the hedonic (over)consumption (Witt Huberts, Evers, & Ridder, 2012).

Self-licensing is based on findings from the decision-making research that people are more likely to make choices that can be easily justified (Shafir, Simonson, & Tversky, 1993) and it is closely related to self-regulation: “When confronted with a typical self-regulation dilemma of gratifying immediate desires versus the pursuit of long-term benefits, people will in many cases be inclined to pursue the hedonic option but will be less likely to do so when the situation makes it difficult for them to justify it. Thus, sometimes indulgence is not determined by ones’ capacity to control oneself but rather by the availability of reasons that one has to justify the prospective indulgence.” (Witt Huberts et al., 2012, p. 491).

In this perspective, the previously exerted self-control effort in self-control strength studies may serve as the “justification cue”, which may facilitate the indulgent (hedonic) choice (breaking diet, smoking and drinking relapses).

Huberts et al. (2012) in their experimental study revealed that participants, who believed to exert more effort in a prior task (but in fact they did the same task as participants in control group), later consumed larger amount of a tasty, but unhealthy food (hedonistic consumption) than participants in the control condition. Authors believe self-licensing to be the independent factor in hedonic consumption: “In sum, the current paper demonstrated that self-licensing is a relevant mechanism underlying unhealthy behavior that is distinct from previously established routes such as self-control failure. By uncovering alternative pathways to hedonic overconsumption, we hope to contribute to a more comprehensive view of self-regulation.” (Huberts et al., 2012, p. 496)

### ***1.4.3 Time perspective and its role in self-regulation***

As said earlier, the future time perspective is a necessary condition of the conscious self-regulation. In this chapter I will present Zimbardo’s social cognitive theory of time perspective and I will show that different time perspective factors, proposed by Zimbardo and Boyd (1999), relate to self-regulation also via the concept of self-efficacy (Bandura, 1991) and especially via the concept of self-control strength (Muraven and Baumeister, 2000).

Time perspective has been operationally defined in a variety of different ways by independent investigators. Most research tried to relate either future or present orientation to other psychological constructs and to their effects on selected outcome behaviors. In general, future time orientation has been related to many positive consequences for individuals in Western society, such as higher economical status, superior academic achievement, less sensation seeking, and fewer health risk behavior. Contrarily, people with dominant present orientation has been considered at risk of many negative life consequences, e.g., mental health problems, juvenile delinquency, crime, and addictions. (Zimbardo & Boyd, 1999)

Zimbardo and Boyd (1999) defined time perspective as “the often unconscious process whereby the continual flows of experiences are assigned to temporal categories, or time frames, that help to give order, coherence, and meaning to those events” (p.1271). These cognitive frames are used in encoding, storing, and recalling experienced events, as well as in forming expectations, goals, contingencies and imaginative scenarios. These learned time frames, and the way how we use them, influence many actions, decisions and judges. Past and future frames work in the human behavior and experienced as a top-down processes working with the representations of past and future, the present frame works as a bottom-up process, relying on the current stimulation, emotional and cognitive state (Lukavská, Klicperová-Baker, Lukavský, & Zimbardo, 2011).

## **Five (or six) time perspective factors**

The main purpose of the contribution that Zimbardo and his colleagues wanted to make in the time perspective research was to develop a reliable, valid and easy-to-use measure of the time perspective in its complexity. On the basis of theoretical analysis, interviews, focus groups, repeated factor analyses, feedback from experiment participants, discriminant validity analyses and item analyses the Zimbardo time perspective inventory (ZTPI) was developed (Gonzales & Zimbardo, 1985; Zimbardo & Gonzales, 1984; Zimbardo & Boyd, 1999).

ZTPI in its current original version (Zimbardo & Boyd, 1999, 2008) measures three temporal frames divided into five time perspective factors: Past-Positive (PaPo), Past-Negative (PaNe), Present-Hedonistic (PrHe), Present-Fatalistic (PrFa), Future (FuPo).

*Past-Positive TP* reflects a warm, sentimental attitude toward the past. Items that load Past-Positive factor includes “It gives me pleasure to think about my past.”, “I get nostalgic about my childhood”, “I enjoy stories about how things used to be in the “good old times.””, “Happy memories of good times spring readily to my mind.”, “Familiar childhood sights, sounds, and smells often bring back a flood of wonderful memories.”

*Past-negative TP* reflects the problematic perception of one’s own past. It suggests focusing on the unpleasant memories and generally aversive attitude toward past. It is composed by items such as “I think about the bad things that happened to me in the past.”, “I often think what I should have done differently in my life.”, “Painful past experiences keep being replayed in my mind.”, “Even when I am enjoying the present, I am drawn back to comparisons with similar past experience.”, “It’s hard for me to forget unpleasant images of my youth.”, “Things rarely worked out as I expected.” (Zimbardo & Boyd, 1999).

Compared to Past-Positive, the Past-Negative items suggest greater lack of control about what a person thinks. The negative past experiences penetrate the mind independently on the person’s wish. This actually may be a source of suffering for past-negatively oriented person, it may cause attentional problems and therefore probably prevent (or make harder to develop) some kind of experience requiring the utter focus on the present, such as meditation or flow. We would also expect a relatively low level of self-efficacy in people with Past-Negative orientation, because they do not experience (or believe to not experience) enough positive events that would make the basis for high self-efficacy beliefs. The aversive thoughts and feeling related to Past negative may also lead to regulative effort and depleting of self-control strength (see previous chapter).

*Present-Fatalistic TP* reveals a fatalistic, helpless, and hopeless attitude toward the life and future. Items that loaded this factor are among others “My life path is controlled by forces I cannot influence.”, “Since whatever will be will be, it doesn’t really matter what I do.”, “It doesn’t make sense to worry about the future, since there is nothing that I can do about it anyway.”, “You can’t really plan for the future because things change so much.”, “Often luck pays off better than hard work.”, “Fate determines much in my life.” (Zimbardo & Boyd, 1999).

Present-Fatalistic seems to be the natural extension of Past-Negative orientation into perception of presence. It is a central concept in the Zimbardo’s view of time perspective,

although its measuring is the most problematic within ZTPI sub-scales. In the original scale (Zimbardo & Boyd, 1999), Present-Fatalistic demonstrated the lowest internal consistency (Cronbach's alpha 0.74) and explained the smallest amount of variance in the sample (3.9%). Present-Fatalistic is to some extent the opposite of Zimbardo's Future time perspective that reflects the proactive, optimistic, conscious and responsible attitude toward future. Present-Fatalistic contrarily reflects the belief that one has no influence on what is and will be happening in his life. According to my view, Present-Fatalistic reflects very much the generalized low self-efficacy beliefs, leading to passivity, resignation, low aspiration level, general feeling of dissatisfaction and the tendency to maximally use any opportunity to feel happy and competent. As I said earlier, I believe that MMORPGs are optimal environment for experiencing flow (positive affects of joy and high performance) and enhancing the self-efficacy via achieving of relatively easy in-game goals. Therefore, I believe that Present-Fatalistic time orientation will be a significant predictor of MMORPGs high consumption, because present-fatalistically oriented people will be highly motivated to this consumption and rather unmotivated (and unable) to regulate it.

*Present hedonistic TP* reflects a hedonistic, lightweight or even irresponsible attitude toward life. It reveals the orientation on present pleasure with little concern about future consequences. It comprises of items such as "Taking risks keeps my life from becoming boring.", "It is important to put excitement in my life.", "I make decisions on the spur of the moment.", "I try to live my life as fully as possible, one day at a time.", "It is more important for me to enjoy life's journey than to focus only on the destination.", "I often follow my heart more than my head.", "Ideally, I would live each day as if it were my last.", "I believe that getting together with one's friends to party is one of life's important pleasures." (Zimbardo & Boyd, 1999)

The similarity of Present-Hedonistic with Present-Fatalistic is in the impulsive acting (on the spur of moment) with little concern about future. However, there are significant differences between both present TPs. While Present-Fatalistic people are generally unsatisfied with their life and passive, Present-Hedonistic people are rather happy and active (enthusiastically engaging in many activities and social relationships). The impact on the enjoying of life (for any cost) is very pronounced in Present-Hedonistic items. According to Zimbardo and Boyd (2008), Present-Hedonistic is an ambivalent TP —it is

good for it brings the energy and enjoyment to life, it is bad, because may lead to risky and irresponsible behavior such as substance use and abuse, risky driving, promiscuity, etc.

I don't think that the Present-Hedonistic TP itself has little concern to the self-regulation or self-efficacy. Present-hedonistic people are oriented toward pleasurable activities, but it is not bad on its own. Moreover, the sensation seeking nature of present-hedonistically oriented people probably ensures that they set challenging goals for themselves and therefore helps to build the self-efficacy beliefs.

Despite of the research on substance use and abuse discussed above, it seems to me that Present-Hedonistic TP would not be the significant predictor of the MMORPGs high consumption, because Present-Hedonistic people derive enjoyment and satisfaction from lot of activities and I believe that gaming alone would not be enough challenge for them.

*Future TP* reflects the tendency to regulate behavior according to future goals or anticipated outcomes. It consists of items such as "Meeting tomorrow's deadline and doing other necessary work comes before tonight's play.", "I am able to resist temptations when I know that there is work to be done.", "It upsets me to be late for appointments.", "I keep working at difficult uninteresting work if it will help me get ahead.", "Before making a decision, I weight the costs against the benefits.", "I make lists of things to do.", "When I want to achieve something, I set goals and consider specific means for reaching those goals.", "I believe that a person's day should be planned ahead each morning." (Zimbardo & Boyd, 1999).

Future TP has an obvious impact on the self-regulation. It is important either as an initial motive of self-regulation or as a mean for its sustaining. Zimbardo's conceptualization of the Future TP is not very common. Previous TP researchers such as Wallace (1956), Cottle (1976) or Nuttin (1985) focused mainly on the extension of future (weeks, months or years) that is included into the person's mental space. Zimbardo on the other hand does not deal with the proximity of anticipated future, but focuses entirely on the ability to regulate one's behavior according to future goals or anticipated outcomes. Therefore, Zimbardo's Future TP reflects mainly the importance of future for person's behavioral regulation and thus in fact the self-regulation ability itself. One can contradict that even the future goals and anticipated outcomes can be unconscious and their pursuit therefore not part of the self-regulation that is believed to be conscious (oppositely to the

instinctive and habitual regulation). However, Zimbardo's Future TP included also the proactive and conscious goal setting process (see some of illustrative items above).

Many researchers argue that the future TP is usually perceived as to be entirely positive (Zalesky, 1996; Nurmi, 2005; Carelli, Wiberg, & Wiberg, 2011; Košťál, Klicperová-Baker, Lukavská, & Lukavský, 2015) and that the adding of another (negative)future sub-factor into ZTPI would enhance its complexity. Carelli et al. (2011) therefore constructed the *Future-Negative* sub-scale, that would reflect thinking and feeling about future with worry, anxiety and non-certainty, and included it into their Swedish translation of ZTPI.

*The Future-Negative TP* consists of items such as “I feel pressure not to be finished with different projects on time.”, “Usually, I do not know how I will be able to fulfill my goals in life.”, “I often feel that I cannot fulfill my obligations to friends and authorities.”, “I often think that I do not have time for everything I have planned to do in one day.”, “To think about my future makes me sad.”, “At night I often reflect on tomorrow's challenges.” (Carelli et al., 2011)

Similarly as in the case of Past-Negative and Present-Fatalistic, I believe that Future-Negative TP reflects the low self-efficacy, because it verbalizes the belief that a person is not able to effectively influence his obligations, his work, his life in general. From the position of the self-efficacy theory, the Future-Negative TP is very similar to Present-Fatalistic and even to the Past-Negative TP, although it belongs to a different time frame. Negative views of one's own past experience create basis for the negative belief about one's effectivity in present and anticipated future, leading to passivity and lack of effort to achieve satisfactory performance, which strengthens the initial negative belief about one's self-efficacy. The circle is closed.

## **Zimbardo's time orientations as cognitive habits**

According to Zimbardo and Boyd (1999), people usually prefer one (or more) frames. This preference develops under various influences (e.g., experiencing success or failure, stressful life situations, family discourse, religiosity, cultural and educational background, etc.), eventually leading into **habitual overusing of some frames at the expense of others**. This is how **temporal bias** is formed. The temporal bias (time



orientation) is learned, largely unconscious, relatively stable but not unalterable. In Zimbardo's theory (Zimbardo & Boyd, 1999, 2008; Boniwell & Zimbardo, 2004 and elsewhere), time orientation is **the individually specific cognitive habit of using various temporal frames**.

Time orientation has proved to relate significantly to various personality characteristics, such as consciousness, impulse control, consideration for future consequences, ego control, novelty seeking and reward dependence, self-esteem, aggression, depression, anxiety and others (Zimbardo & Boyd, 1999) and various behavior—e.g., substance use and abuse (Keough, Zimbardo, & Boyd, 1999; Apostolidis, Fieulaine, & Soulé, 2006a; Barnett et al., 2013; Sansone et al., 2013; Hall et al., 2012), gambling (Hodgins & Engel, 2002), suicidal tendencies (Laghti. Liga, Baumgartner, & Baiocco, 2009a), risky driving (Zimbardo, Keough, Boyd, 1997), procrastination (Ferrari & Díaz-Morales, 2007; Diaz-Morales, Ferrari, & Cohen, 2008), health behavior such as dieting and exercising (Gellert, Ziegelmann, Lippke, & Schwarzer, 2012; Guthrie, Lessl, Ochi, & Ward, 2013; Hall, Fong, & Cheng, 2012), preventive health care (Daugherty & Brase, 2010), school achievement (Phan 2009; Worrell & Mello, 2007) career decision making (Taber, 2013) and others.

As usage and its regulation are the main concern of this thesis, I focus on the studies on substance use or related phenomena (e.g., gambling). Zimbardo and Boyd (1999), while arguing for need of reliable and valid instrument that would measure the time perspective in its complexity, noted that time perspective studies usually analyze the impact of the single temporal frame and systematically underestimate the role of past time perspectives in many areas of characteristics and behavior. Unfortunately, I have to declare that most current studies suffer from the same problem. The majority of studies on substance use and abuse consider only the role of future time perspective (FTP) on the consumption behavior. The FTP has been revealed to be a protective factor against various substance use in all analyzed studies (Keough et al., 1999; Apostolidis et al., 2006a, Barnett et al., 2013, Sansone et al., 2013), however Keough et al. (1999) revealed that the present time perspective (PTP) that contrary to FTP relates positively to the substance use, accounts for more variance than FTP. Hall et al. (2012) investigated the relationship between FTP and the attempt to quit smoking on the large sample of 8845 adult smokers and found that respondents with higher FTP were more likely to make a quit attempt. However, he did not

find the significant relationship between FTP and the quit maintenance (an abstinence from smoking for at least a month). We need to note, that in Hall's et al. (2012) study, as well as in Sansone et al. (2013) the FTP was measured very simply —using only one item from Fong and Hall Time Perspective Questionnaire (TPQ) that stated: “You spend a lot of time thinking about how what you do today will affect your life in the future.”. This concern necessarily brings the question on reliability and validity of their measurement.

From the above mentioned studies of our concern, only Hodgins and Angel (2002) measured all temporal frames, using the standard version of ZTPI (Zimbardo & Boyd, 1999). They compared three small groups of respondents: pathological gamblers (N=20), social (non-pathological) gamblers (N=22) and the control group of psychiatric patients (N=20) and found some significant differences in groups' mean ZTPI scores. Surprisingly, the most pronounced differences between pathological and social gamblers were found in both past factors (pathological gamblers scored significantly higher in past negative scale than social gamblers; the situation was opposite for the past positive scale), then in both present factors (in both present hedonistic and fatalistic pathological gamblers scored higher than social gamblers). No significant difference was found for the future scale between the two groups of gamblers. This could be interpreted in a way that pathological and social gamblers might have similarly low FTP and therefore the comparison with non-gamblers would be needed. The FTP was found to be slightly higher in psychiatric patients than in gamblers but the difference was not significant. Generally, the pathological gamblers and psychiatric patients showed similar TP patterns. Nevertheless, past time orientation measurement should definitely be included into studies on problematic consumption behavior.

According to Zimbardo and Boyd (1999), self-efficacy beliefs (as defined by Bandura, 1997) that mediated self-regulation processes, are grounded in past experience, current appraisals and reflections on future options, which constitutes a temporal influence on self-regulation. I believe that Zimbardo's different time perspective factors reflect different kinds and different levels of self-efficacy. **I believe that negative TP factors (negative past, fatalistic present, and negative future) reflect the low self-efficacy beliefs and lead to similar outcomes in experiencing and behavior. The positive future on the other hand is an important factor of the effective self-regulation.** This presumption is to some extent verified by the analysis of the inner structure of ZTPI, where

some strong relations were found via the correlation analysis and structural modeling between negative past, negative future and fatalistic present (Košťál et al., 2014; Lukavská et al., 2011). Also Zimbardo and Boyd (1999) revealed on their five-factors ZTPI (without Future-Negative) the strongest correlation between Past-Negative and Present-Fatalistic.

The negative temporal orientation is also important in regard to the theory of self-control strength. As presented in the previous chapter, self-control had been found to be **depleted by negative feelings and moods** (Muraven & Baumeister, 2000). Negative time orientation is characteristic by presence of negative feelings and thoughts and thus it is probably connected to deficient self-control (and therefore deficient self-regulation).

#### ***1.4.4 Cultural-historical activity theory (CHAT) approach to self-regulation***

##### **Developmental perspective on the self-regulation**

A little has been said so far about how the self-regulation develops. Bandura (1990) in his experiments revealed that the self-efficacy, which is according to him a major factor in effective self-regulation, related to two kinds of belief —the first kind concerns the conceptualization of ability, the second kind concerns the belief of how much the person's environment is changeable. Bandura (1990) argued that if a person perceived the ability as an acquirable skill, it led to higher effort in the activity, setting challenging goals, considering mistakes as a natural part of performance, and eventually to a resilient high self-efficacy. Contrarily, if a person perceived the ability as an inherited capacity, it led to worrying about mistakes, setting easy goals that permits display the competence, and eventually loosing the self-efficacy belief when problems occurred. Similarly, when a person believes that he can make significant changes in his environment, he does his utmost to make that change. Subsequent success further strengthen his positive belief and the result is the stable self-efficacy (Bandura, 1990). Contrarily, when a person does not believe he is able to change his environment, he develops much less effort and resulting failure strengthens his negative belief, eventually forming the low and unstable self-

efficacy (Bandura, 1990). However, Bandura did not specify how these different beliefs were acquired and whether they could be changed.

Zimbardo and Boyd (1999, 2008) tried to include the developmental perspective into their theory. They argued that time perspective as a whole is a learned process, as well as the individual temporal biases (time orientation) are. They specified that future(-positive) time perspective, which closely relates to self-regulation, is more likely to develop when a person is living in a temperate climate; living in a stable family, society, nation; being Protestant or Jewish; becoming educated; having a job; using technology regularly; being successful; having future-oriented role models; and recovering from childhood illness (Zimbardo & Boyd, 2008, p. 139-143). When authors analyzed these conditions, they emphasized the aspects of the environment that make a person to plan (e.g., the changing seasons and weather conditions in a temperate climate) and that allow a person to anticipate consequences (stability). Education is seen as a highway to future orientation, because it requires delaying of gratification, goal-setting, cost-benefit analysis and abstract thought. Similarly, the meaningful job according to Zimbardo and Boyd (2008) imparts the sense of self-identity, generates pride in one's achievements, provides temporal structure for each day and cultivates self-discipline. Ideally, it also enhances the opportunity for personal development, achieving ambitions, gaining economic security and independence. In regard of previously analyzed factors in self-efficacy development, it is not surprising that the experiencing success is also an important factor in developing of future time perspective. Zimbardo and Boyd (2008) hypothesized that the inability to act (e.g., because of illness or injury during childhood or young adulthood) enhances the mental activities such as to imagine the scenarios of actions and to imagine the self-sufficiency. Authors emphasized that the listed factors are neither necessary or sufficient for making a person future-oriented, they only increase the probability of developing the future orientation. They acknowledged the role of interpersonal dynamics and personal experiences, the factors that are not easy to measure.

To sum up, the mechanisms of self-efficacy and future time perspective developments are only sketched in the theories analyzed so far. Therefore I will present yet another conceptualization of self-regulation within the framework of cultural historical activity theory (CHAT).

## The self-regulation in CHAT

Cultural historical activity approach is based on the work of Russian psychologist L.S. Vygotsky (“the first generation of CHAT” as defined by Engeström, 2009). Vygotsky (1978) made a contribution toward the understanding of human self-regulation through the idea of signification and mediated action.

### Signification and mediated action

With the concept of signification, Vygotsky introduced the idea that human beings are not passively reacting to environmental stimuli, but they can regulate their behavior via the creation of specific stimuli – signs (Van der Veer, 2007, p. 28). Signification is “a pervasive regulatory principle of human behavior“ (Vygotsky in Engeström, 2007, p. 364).

Vygotsky (1978) claims that in humans each cognitive process (perception, attention, memory, thinking) develops its higher form via incorporating extrinsic stimuli (e.g., taking notes to enhance one’s memory). “The central characteristic of elementary functions is that they are totally and directly determined by stimulation from the environment. For higher functions, the central feature is self-generated stimulation, that is, the creation and use of artificial stimuli, which becomes the immediate causes of behavior“ (Vygotsky, 1978, p. 39). Vygotsky calls these self-generated stimuli *signs*. Signs come from the environment, but affect the individual, not the environment. Signs transfer the psychological operations to higher and qualitatively new forms and permits humans to control their actions.

The signification (creation of signs) seems to be the core mechanism that is needed for goal-setting, delaying of gratification, anticipation of future consequences and other key processes in human self-regulation. Via the analyzing of signification process, we can understand the roots of self-regulation.

The creation of signs is not the ability that humans show from their birth. Vygotsky (1978) presented the experiment, in which children of different ages (5-6; 8-9; 10-13) were asked to perform some cognitive tasks with or without the potentially helping stimulus (stimulus that a child could convert into a sign to enhance her performance). In the experimental setting, children were supposed to answer set of questions with a single word. Some questions required using the names of colors and children were supposed to keep two rules: do not use two forbidden colors (e.g., green and yellow) and do not name any color

twice. The potentially helpful stimulus was the set of nine cards of different colors (always including the forbidden ones). The difference in performance with and without cards was revealed in school-age children (8-9 year-old) and was most pronounced in 10-13 year-old group. The preschool children (5-6 year-old) did not benefit from the cards, they were generally unable to discover, how to use them and their performance was even hindered by cards in some cases (e.g., the child kept saying “white” on color questions, while her attention was attracted by the white card). In the control group of adults, the performance was high in both conditions (with and without cards). Vygotsky (1978) explained it via the process of internalization —adults did not need the external signs (cards) to enhance their memory, because they had already developed its higher form and are able to produce the internal signs (that are emancipated from the external material form) to enhance their memory performance.

On the basis of the described experiment, we can hypothesize that **the ability to create external signs** (1) is accessed at some point in human development (probably requires some prerequisites, either biological or social), (2) is a prerequisite for the ability to create internal signs.

Vygotsky claims that the sign-using activity is neither simply invented by child, nor passed down by adults; it arises from the use of *tools* and from the use of human *language*.

Tools are means that enable humans to change their environment, similarly as the signs enable humans to change their own psychological functions. Both tools and signs are called mediating artifacts, because they mediate human reactions to the stimuli. The tool serves as a conductor of human influence on the object of action; it is externally oriented – it leads to changes in object. These changes must not be material —often it is merely their interpretation that creates the change. In the above experiment, school-age children interpreted colored cards to be signs for enhancing their memory. They changed (or rather created) their meaning. The external qualities of stimulus no longer mattered —what color shined most brightly or what card was in the top. Children gave them completely new meaning —some cards represented colors that must not be named, the rest represented the pool from which color names can be picked.

Vygotsky emphasized in several places the active attitude of people toward their environment, when he analyzed the difference between elementary and developed psychological functions. On the example of memory, he claimed that “In the elementary

form something is remembered; in the higher form humans remembered something. In the first case a temporary link is formed owing to the simultaneous occurrence of two stimuli that affect the organism; in the second case humans personally create a temporary link through an artificial combination of stimuli. The very essence of human memory consists in the fact that human beings actively remember with the help of signs... The basic characteristic of human behavior in general is that humans personally influence their relations with the environment and through that environment personally change their behavior, subjugating it to their control” (Vygotsky, 1978, p.51). Vygotsky argued that people cannot regulate their behavior directly, but through changing (dominating) the objects in the environment to work for them as signs. For this influence over environment humans use various cultural tools —tools that mankind created in the history. Among them, the speech is the most important, which is not surprising while a lot of influence is conducted as interpretation or reinterpretation of some objects. To name others, a modern technology (such as computer, Internet, etc.) is the tool that is paid a lot of attention currently in regard to enhance of learning, thinking and creativity (e.g., Hakkarainen 2009a,b).

When I tried to link Vygotsky’s theory of cultural mediation with previously discussed theories of self-regulation, I encountered some problems. It was obvious that Vygotsky perceived the self-regulative capacity in any person through the ability to use tools and creates signs. However, it was not clear whether the use of mediating artifacts was somehow individually graded (humans differ in their ability to use artifacts) and whether it was an always-present aspect of each human action. If not, what motivates a person to the use of artifacts? Those important questions required further clarification. I found it partially in the concept of double stimulation and agency.

## Double stimulation and agency

In the search for a way how to induce signification process in individual, Vygotsky (1978) formulated *the method of double stimulation*. In double stimulation experiments “the subject is confronted with the task beyond his present capabilities and cannot be solved by existing skills. Simultaneously, a neutral object is placed near the child, and frequently child draw this stimulus into the situation as a sign” (Vygotsky, 1978, p.74). This suggests that the signification process is usually visible (and therefore obviously

present) while a person face up a difficult task beyond his current level of ability. However, as pointed out by Engeström (2007) the subject always “imports” a set of psychological instruments (artifacts) that experimenter cannot control. The subject does not react on the provided stimuli, but actively construct the new psychological phenomena within the experimental structure. This active intentional attitude within the action is called *agency* (Engeström, 2007).

The intentional action is always mediated via artifacts that are actively constructed within the situation. The agency therefore is the ability to construct relevant artifacts in order to master the object of action. As an example of agency, Engeström (2007) discussed a case of a student that creates the small cheating device (cheat sheet, paper slip). Imagine the student that faces the very challenging exam that requires memorizing of a great deal of knowledge. The student is aware that he cannot memorize everything (the task is beyond his current level of ability). One way is to give up and fail the exam, the other way is creating of the external tool (cheat sheet) that enhances students’ performance in exam. A good cheat sheet is small and it cannot contain much text. Therefore, to create a good cheat sheet, the student must carefully select the most relevant and useful aspects of topic and represent them in an economic and accessible way. The process of creating of cheat sheet is objectification of students’ preparation for exam and it is a way to master the testing situation, which is the core of traditional schooling. It also involves the risk because using cheat sheet is against the rules of activity. Engeström (2007) gives another example of agency in school context describing the behavior of a pupil, who wants to avoid the failure in the classroom. “The pupil knows that the teacher usually asks questions of students who seem confused, or not paying attention. Therefore, she feels safe waving her hand in the air, as if she were bursting to answer, whether she really knows it or not.” Such behavior is in conflict with the rules of the activity specifying that pupils raise a hand only if they know the right answer. “Agency is constructed and manifested in actions of testing and goes beyond the limits of what is required and allowed” (Engeström, 2007). Here, the limitation of the first generation of CHAT is obvious —while the focus is entirely on the individual action (and of course cultural artifacts that mediate it), it is not possible to see the conflicts or challenges that motivate the actions.

The step forward is the broadening of the unit of analysis to the activity system with its collective intentionality and shared tools made by A. N. Leont’jev (1978) and further



developed by Engeström (1987, and elsewhere). The individual agentive actions can be only analyzed within the context of an activity (second generation of CHAT, Engeström, 2009), respectively in the context of interrelated activity systems (third generation of CHAT, Engeström, 2009).

I believe that **the self-regulation in online games consumption can be interpreted as the emergence of the agency within the online gaming activity**. In the next chapter, I will show that the regulation of consumption is not the part of shared intentionality of online gaming activity and the regulation of consumption requires agentive action with the creating new mediating artifacts.

The analysis of activity systems is not limited to their psychological aspects, it involves also the economical, societal and other sides of the activity. Problems and potentials of the activity system can only be understood according to Engeström (2007) against their own history, which means that history itself needs to be studied as a local history of the activity, and as a history of the theoretical ideas and tools that have shaped the activity. This study of history helps to reveal historically accumulating structural tensions within or between activity systems that are called *contradictions*. Contradictions generate disturbances and conflicts, but they are also sources of change and development of activity (through agentive actions of involved individuals) while correctly identified and analyzed.

Agency (as the opposite of helplessness, Nummijöki & Engeström, 2010) is a similar concept as Bandura's self-efficacy. In the CHAT theory however the sources of the agency are not situated within the individuals (as beliefs) but rather in the culture and society—in the mediating artifacts. The loss and the gain of agency therefore is largely based on the existence of relevant artifacts that help people to overcome perceived contradictions within the activity which they participate in.

## **The analysis of MMORPGs consumption activity**

As said earlier in this thesis, the MMORPGs' history is not long. Their existence was enabled by the massive use of personal computers on one hand and the massive spread of broadband Internet on the other, which situates the first MMORPGs into late 90's. They built on the games like Dungeons and Dragons (RPGs) where the gamer is represented by

(and his or her actions are mediated through) the virtual character (avatar). The initial RPGs (pen-and-paper) were played in small groups of people, mediated generally through shared narration (Pekárková, 2008). The MMORPGs were created as virtual environments existing online that many (hundreds to thousands) players could participate in at the same moment through their virtual avatars. MMORPGs used a 3D engine allowing players to experience the environment through their avatars' eyes.

The economic model is that the player buys the game (software) and pays the fee (usually monthly) for the participation in the game environment. This is a significant difference from the other computer/video games. While designing and selling a “common” game title (such as Tetris, or Civilization, or GTA), the developer/seller wants to sell the item, earning single shot money and does not care much about how much a player will play or enjoy the game. Of course, it is good when the player enjoys the game, because it increases the probability that other players buy it (on his recommendation) and also the probability that the player will buy other similar titles (from the same genre, from the same developer, etc.). With the MMORPGs, the situation for the developer (and provider, which is usually the same company) is quite different. The main income does not come from the single shot selling the game (software) but from **fees that players pay for the access to gaming environment. The MMORPG is as rentable as players keep it playing (consume)**. The fee does not depend on how much time player spends in the game environment, however people usually evaluate if the amount (and the quality) of time they spent playing the game is worth of the money. **Therefore, for the developer/provider as well for the consumer, the more playing time, the better** —the consumer has the feeling that he properly uses his money (the gaming possess the high use value for him) and the developer/provider knows that this feeling increase the chances that the consumer will continue to pay for his consumption. **The excessive use is de facto the common objective of participants of the activity**. The developer/provider therefore provides the very effective artifacts to enhance the excessive consumption. To mention some:

(1) the virtual environment (gaming servers) are working **continually** (in common games, the gaming environment exists and changes only when you are in; in MMORPGs it changes and develops constantly and therefore when you are not in, you might have feeling that you are missing something). The necessary breaks for the servers' maintenance are always scheduled into the hours when most players do not play (e.g. between 3 and 4 am);

(2) the environment is designed to be **maximally immersive** (appealing for your senses, requiring your full attention) and to **induce the flow** by providing clear goals, excellent feedback, etc. (see Chapter 1.3);

(3) the game is **never finished** (contrary to common games that always had some kind of end — a player successfully reaches the end of story or he fulfills one of the victory conditions that game requires, etc., MMORPGs do not have such clear end, they provides a player with many challenges and prompt him to create his own challenges within the environment).

(4) the avatar **develops** and is practically **immortal** (the avatar is an important part of the gaming as has been recognized by some researchers(e.g., Smahel, Blinka, & Ledabyl, 2008); the avatar represents the level of influence a player has on the environment —the more developed avatar means greater influence; the development depends entirely on how much time a player spends by playing it; there is no danger that this time investment could be foiled, because the avatar is practically immortal —it can die, but it is a merely a little delay, because it is automatically resurrected within seconds or minutes)

There are also usually many little tools that ensure the smoothness of the play and the best performance (e.g., Quest Helper in World of Warcraft that navigates you to proximate goals and hundreds of others for every single aspect of the playing activity that are available easily online, see e.g. website <http://www.wowinterface.com/addons.php>).

This analysis somehow resonates with the Rational addiction theory, as proposed by Becker and Murphy (1998) and other economists. It suggests that an individual's continuous interaction with certain goods builds up a "consumption capital" over time. As this capital accumulates, the utility of the goods to the consumer increases, which in turn increases the likelihood of addiction. However, the addiction to certain goods with a maximized utility does not necessarily mean that these addicts are enjoying the greatest happiness. Rather, they are prisoners of desire; their happiness will drop to the lowest level if the addictive goods are withheld (Dockner and Feichtinger, 1993 In Chou a Ting 2003).

Now, there is an important question —how come that some players do not play excessively? I believe that some players succeed in developing of the agency within the MMORPGs consumption and start creating the artifacts that help them regulate the usage. The motivation for the taking of the agentive action can be various. The most obvious motivation is **the occurrence of conflict** between MMORPGs playing and other activity

systems, in which a person is engaged —e.g. school, work, sport and other hobbies, romantic relationship, etc. When a player registers such conflict, it motivates him to take an agentic action to change the activity to eliminate the conflict —transform the excessive unregulated use of MMORPGs to a controlled use that enables coexistence of the activity with other activities.

To come back to the initial question on how the self-regulation develops according to CHAT, I believe I can answer now. The self-regulation in CHAT is the agentic action, which is motivated by perceived conflict within or between activity systems and relies on the creation and using of appropriate artifacts, that mediates the agentic action in order to change the activity and eliminate the conflict.

It is possible to interconnect the CHAT theory with the Bandura's theory of self-efficacy. Similarly to Bandura, CHAT acknowledges the importance of self-monitoring — the conflict within activity system (or between activity systems) must be registered by the individual and this registration creates a major motive for self-regulative effort ( called agentic action in CHAT). The effectivity of this regulative effort depends according to Bandura on the self-efficacy, which is based on personal beliefs. In CHAT, the effectivity of agentic action depends on the availability of mediating artifacts that a person can use in order to change the activity and eventually his behavior.

Applying this into the self-regulation in MMORPGs consumption, we can hypothesize several **causes of the unregulated MMORPGs use**:

- (1) there is no conflict within the activity or between the activity systems and therefore a gamer feels no need for regulation (agentic action), because the excessive consumption is the desired outcome of the online gaming;
- (2) there is a conflict within the activity or between the activity systems but this conflict has not been recognized by a gamer and therefore he is not motivated to take agentic action (self-regulative effort) to change his behavior;
- (3) there is a recognized conflict and gamer is motivated to change, but he lacks the appropriate artifacts to take agentic action (the self-regulation fails).

Ad (1): we must consider two scenarios. In the first scenario, a gamer has an unlimited time for playing, because he is not engaged in other activities (this scenario is

described earlier in the text as a case study of Dave, see Chapter 1.1.2). In the second scenario, we must hypothesize some other mechanism (other than the agency/conscious self-regulation) that functions as a factor preventing the excessive consumption that would create a conflict. I believe that this mechanism is **the habitual regulation** of consumption behavior. I will analyze it in the next chapter.

Ad (2): reasons why a person does not recognize or underestimate the conflict occurring due to his consumption may be various. Based on theories presented so far, the simplest explanation is that (a) subject has inferior self-efficacy (that is in my understanding tightly connected with negative time perspective orientation) and therefore his self-monitoring processes are weakened and/or (b) the perceived positive outcomes he extracts from the activity outweigh the motivational power of the conflict. As noted by Prochaska et al. (1992), contemplators (people that recognized their problematic behavior, but have not yet made a commitment to take corrective action) usually weight the pros and cons of the addictive behavior—they struggle with the positive outcomes of the addictive behavior that can be quite high in some cases. As I pointed out in Chapter 1.3, the MMORPGs playing is certainly a source of positive affects and may be also a way to experience self-efficacy (Chapter 1.4.1).

Ad (3): I believe that the effective self-regulation in MMORPGs consumption has many difficulties and it is somehow unfitting the nature of the activity. Therefore I believe that to develop effective self-regulation, creating of the relevant and useful mediating artifacts is required. Within the Study 3 presented in this thesis, I will analyze some strategies that players already use for their time control within playing MMORPGs. In my understanding of CHAT theory, I believe that also some psychological functions, such as Future-Positive time perspective, serve as a mediating artifact of one's self-regulation.

## **1.5 The habitual regulation of online games usage**

As pointed out by Aarts et al. (1998), psychology is concerned with gaining insight into the psychological predictors of socially relevant behaviors (such as smoking, exercising, using seat belts, recycling etc.) and the processes underlying them in order to prevent, promote, or change these behaviors. Research efforts have thrown more light on the reason-based and deliberate nature of the behavior (consciously regulated behavior), however one important aspect has been overlooked in this research; namely, the fact that many of the aforementioned behaviors are executed on a daily, repetitive basis, and therefore may become routinized or habitual (Aarts et al., 1998).

The same could be said for the online games (or media generally) consumption.

LaRose et al. (2003) presented the habitual media use as the opposite of the conscious self-regulated use. They argued that the self-regulation weakened as the habitual regulation strengthen. This is in agreement with arguments of other scholars, e.g., “It is proposed that when behavior is performed repeatedly and becomes habitual, it is guided by automated cognitive processes, rather than being preceded by elaborate decision processes (i.e, a decision based on attitudes and intentions).” (Aart et al., 1998).

Aart et al. (1998) summed up the most important characteristics of habitual behavior:

(1) habits do comprise a goal-directed type of automaticity. That is, habitual behaviors are triggered by certain stimuli in the presence of a specific goal. In other words, these automatic actions are instrumental in obtaining a certain goal.

(2) satisfactory experiences increase the tendency to repeat the same course of action, because the instrumental action becomes more strongly associated with the goal one initially wished to attain. Furthermore, the stronger the reinforcement is, the stronger the association between the goal and the instrumental action becomes. Contrarily, dissatisfaction weakens the link between goal and behavior, decreasing the probability a person will repeat the behavior. Habit strength therefore increases as a result of frequent repetitions of positive reinforcements (although it remains difficult to predict how regularly and frequently a behavior has to be executed in order to become a genuine habit).

(3) lately, it has been argued that the influence of environmental cues over habitual behavior is not automatic, but that the cognition mediates the process. Frequent performance of an action in a certain situation (under the certain environmental cues) leads to easier activation of the mental representation of the action and consequently action itself.

### **1.5.1 Sensitivity to cues**

Aart et al. (1998) mentioned the role of *situational cues* as triggers that activate mental patterns connected with the habitual behavior and consequently habitual behavior itself. Orbell and Verplanken (2010) further emphasize the importance of cues when characterized habit as *a form of automaticity that involves the association of a cue and a response*. They propose that “a habit is behavior that is frequently repeated, has acquired a high degree of automaticity, and is cued in stable contexts.” (p.374). They emphasized that habitual actions are conducted automatically with little conscious awareness, triggered by situational cues. They presume the variety of cues that may function as habitual triggers, e.g., performance locations, preceding actions in a sequence, the presence of particular people, or an internal feeling or thought. The performance of a habit involves delegating behavioral control to the cues. Orbell and Verplanken (2010) present the example with eating cookie: “person’s initial decision to eat a cookie when drinking a cup of tea might be guided by an active goal state (e.g., feeling hungry). However, over time the goal becomes less necessary as cookie eating is repeated and becomes integrated with the act of drinking tea so that it can be triggered by the cue alone. The behavior slowly acquires the qualities of cue contingent automaticity, so that an individual may eventually come to think of cookie eating as ‘A bad habit,’ or something that ‘I cannot help doing.’” (p. 374).

According to Orbell and Verplanken (2010), the initial goal state (e.g., being hungry) cannot be actually present to conduct habitual action (e.g., eating cookie). This is important difference from the above mentioned characteristic by Aart et al. (1998) that habitual behavior is triggered in the presence of specific goal.

Orbell and Verplanken (2010) explicitly stated that cues control behavior directly and that this fact is crucial to understand how habits work and why they usually resist to modifications (p.375).

LaRose et al. (2003) argued that the habitual regulation and its strength is the predictor of the excessive media usage.

Although I agree with the theory of habit formation at the expense of conscious self-regulation, I do not believe that the predominance of habitual media use has such definite consequences as the above mentioned authors claimed.

The habitual regulation is very important in many areas of life —we do not make deliberate decision every day whether to go to work, we do not need to motivate ourselves every morning to brush our teeth, we do not think whether to have a coffee after lunch or not. We do many things, because we once find them good or sometimes even because we saw other people do them. For our mind, the habitual regulation of behavior is very useful, even necessary because it saves the capacity of the conscious attention. People have neither the mental resources nor the time to constantly perceive, evaluate, and then act with respect to every aspect of life. Habits are one solution to this problem.

LaRose et al. (2003) automatically presumed that repetitive (and therefore habitual) use will eventually lead to excessive consumption. That would be probable when the media consumption will be the only activity system, in which one is engaged. But it is most usually not. People study, work, have hobbies, involve in romantic relationships and other social relations, etc. The majority of these activities is probably also habitually managed and may draw some borders for the media consumption, even when consumers themselves are not fully aware of that. As pointed out by Muraven and Baumeister (2000), “the majority of behavior occurs in an automatic fashion, with minimal active participation by the self” (p.247). People can actually develop very effective regulation of media consumption without the conscious regulative effort. Of course, for some consumers this habitual regulation may not work so smoothly and they actually develop the excessive or even problematic consumption pattern. I already argued that factors that encourage excessive consumption are rather essential part of the activity in case of MMORPGs. In my thesis, I aimed to investigate if MMORPG players can also benefit from the habitual regulation and if and eventually how the conscious self-regulation influences the process of habitual regulation.

To access the different outcomes toward which the habitual regulation can lead, I developed the concept of sensitivity to proplay and contraplay cues. The cues are conditions (e.g. *work to be done appears*, or *in-game action starts*) under which players are



used to start and continue (proplay cues), respectively prevent from and stop (contraplay cues) gaming sessions.

The strong proplay cues sensitivity probably will lead to excessive consumption, while the strong contraplay cues sensitivity will probably prevent it.

LaRose et al. (2003) claimed that the cue for a problematic unregulated consumption is the dysphoric mood and negative affects. I argue that there are many in-game or out-game cues that encourage player to start or continue playing, as well as there are cues that encourage players to prevent or stop playing.

On the basis of introspective self-experience, informal interviews with gamers and pilot unpublished study made on 183 MMORPG players, I developed the inventory consisting of 23 such cues to which respondents are asked to pronounce their sensitivity (reactivity). There are items such as “I start playing if I am angry or sad.”, “I start playing if a planned guild action starts.”, “Even if I would like to, I don't start playing if I have work to be done.”, “...I don't start playing if I am tired.”, “I stop playing if I am asked to stop by a close person (e.g. partner, friend, parents, brother or sister).” , “I stop playing if the work to do appears.”, “Even if I should, I do not stop playing if I am having fun.”, “...I do not stop playing if I am close to desired achievement (level, equip, mission, companion, talent...)”

Although I argue that the habitual regulation is the stand-alone variable in MMORPGs consumption, I believe that it can be influenced by self-regulation while a player is motivated to do so.

## PART TWO: THE ROLE OF HABITUAL AND CONSCIOUS REGULATION IN MMORPGS USAGE

Within the theoretical part of my thesis, the hypothetical relationships between MMORPGs consumption, self-regulation, self-control, time perspective and habitual regulation has been revealed. In order to further clarify and confirm these relationships, I conducted two research studies. Both studies are based on inventory responses and involved MMORPG players recruited online via the gaming forums advertisements.

Respondents recruited for Study 2 in 2012 was asked again to participate in Follow-up study in 2015. Within Study 2 in 2012 were apart from quantitative data collected also qualitative data concerning players' strategies for playing time control. Study 3 reffers to the analysis of those qualitative data.

Research studies that will be presented in this thesis:

Studies	Conducted in	N	Main focus
Study 1	2009	154	Measuring Time perspective in MMORPG players together with MMORPG usage (time spent playing).
Study 2	2012	377	Path-modelling of relationships between Time Perspective, conscious and habitual regulation of gaming and MMORPG usage (time spent playing, problematic usage symptoms).
- Follow-up	2015	76	Identifying of factors that lead to change in gaming patterns.
Study 3	2012	164	Categorization of strategies that players use for controlling the time spent playing.

## **2.1 Study 1**

### **2.1.1 Design and Hypotheses**

The major hypothesis of Study 1 concerned the time perspective to be a predictor of MMORPGs consumption. On the basis of the previous research on the time perspective and repetitive behavior (especially substance use and abuse, gambling), I expect to find:

1) Positive relationships between present time orientations (Present-Hedonistic and Present-Fatalistic) and the average time spent playing by week and session (“playing time”);

2) Negative relationships between future time orientation (Future-positive) and playing time.

I also hypothesized that the balance between Future and Present factors might be even better predictor of high MMORPGs usage than independent factors.

I expected to find the negative relationship between Future minus Present-Hedonistic composite factor and playing time, as well as between Future minus Present-Fatalistic composite factor and playing time.

We used Pearson’s correlation analysis to confirm hypothesized relationships between variables and mean-difference analysis (Welsh’s t-test for independent samples) to investigate the differences in playing time among individual time perspective factors’ low-scorers and high-scorers.

## **2.1.2 Methods**

### **Data collection procedure**

Participants for Study 1 were recruited online on the Czech Internet forums on MMORPGs. Forum posts provided the brief description of the research focus and the link to the online inventory were posted online. The online inventory was powered by the Google Forms platform. After a respondent answered all questions, he could submit his answers and he received the instant feedback on the screen to confirm the data had been recorded and to thank for his participation. Submitted answers were automatically collected in the spreadsheet, which only the researcher was able to access.

The inventory in Study 1 was in Czech.

The respondents were self-selected, they all agreed with the participation in the study (they were asked to confirm their agreement at the end of the online questionnaire, before submitting their answers) and they were promised no reward for their participation.

The data collection for Study 1 took place in Autumn 2009.

### **Sample**

Data from 154 (141 males, 13 females) respondents between 12 and 37 years ( $M = 19.1$ ,  $SD = 4.0$ ) were obtained. Respondents were mainly active players (141) but there were also some former players (13). Respondents were primarily players of World of Warcraft (127) or Lineage 2 (24). Only a few active players played more than one MMORPG at the time (6). Respondents were mainly Czech and Slovak.

## **Measures**

### **Playing time**

Playing time was measured via self-reports of gamers. They were asked to answer two questions: “How many hours per week do you spend playing MMORPGs?” (variable HpW) and “How long does your typical session usually take?” (variable HpS)

### **Time Perspective**

Five time perspective factors (Past-Positive, Past-Negative, Present-Hedonistic, Present-Fatalistic and Future) was measured using Zimbardo’s Time Perspective Inventory (ZTPI) in its Czech standardized translation that had proved good psychometrical properties measured on the large Czech sample of 2030 respondents (Lukavská et al., 2010).

ZTPI consists of 56 items in the form of statements. The subjects express their level of agreement with each statement on a scale 1 to 5. Several items from each scale were presented in the Chapter 1.4.2. The full inventory with the English items and their Czech equivalents is to be find in Appendix I..

## **Data analysis procedure**

All statistical analyses were conducted in the free statistical software R (R Core Team, 2014).

## **2.1.3 Results**

### **Descriptive results for measured variables**

#### Playing time

##### **Hours per Week (HpW)**

The time that respondents indicated to spend playing weekly ranged from 1 to 120 hours (M = 28.19, SD = 18.80, Median = 24).

##### **Hours per Session (HpS)**

The indicated length of the usual session varied from 15 minutes to 15.5 hours (M = 4.15, SD = 2.45, Median = 3.75).

The correlation between both playing time measures was very strong ( $r = 0.73$ ,  $p < 0.001$ ).

#### Time perspective

Using ZTPI, we measured five time perspective factors. They all showed acceptable internal consistency: Past-Positive (Cronbach's alpha = 0.65), Past-Negative (Cronbach's alpha = 0.85), Present-Hedonistic (Cronbach's alpha = 0.85), Present-Fatalistic (Cronbach's alpha = 0.72), and Future (Cronbach's alpha = 0.73).

There were found some significant correlations between factors (Table 1). The strongest correlation was in accordance with presumptions made in theoretical part of this thesis (see Chapter 1.4.3) found between Past-Negative and Present-Fatalistic.

Table 1: Pearson's Correlation Coefficients Between Time Perspective Factors.

	PaNe	PaPo	PrHe	PrFa
Past-Negative (PaNe)	---			
Past-Positive (PaPo)	-0.04	---		
Present-Hedonistic (PrHe)	0.14	0.26 **	---	
Present-Fatalistic (PrFa)	0.45 ***	0.22 **	0.38 ***	---
Future (Fu)	-0.08	0.02	-0.29 ***	-0.32 ***

\*\* $p < 0.01$ , \*\*\* $p < 0.001$

## The hypotheses testing

As the first step we conducted the correlation analyses between both playing time measures and all Time Perspective factors (Table 2). As presumed, we found a significant positive relation between playing time and the present fatalistic factor. Surprisingly, the relationship between playing time and the present hedonistic factor was not significant. We also found, in accordance with our hypotheses, a negative relationship between the future factor and playing time. It was not significant for HpW, but it was significant for HpS. We obtained convincing results in the case of the relationship between future-present balance and playing time. Based on factor z-scores, we computed two composite variables:

future minus present hedonistic, and future minus present fatalistic. Then, we analyzed the relationships between each of these variables and both measures of playing time. As shown in Table 2, we found significant results for all correlation tests, except for the relationship between future minus present hedonistic and HpW.

Table 2: Pearson's Correlation Coefficients Between Time Perspective Factors and Playing Time

	Hours per week	Hours per session
Past-Negative (PaNe)	0.06	0.02
Past-Positive (PaPo)	-0.09	-0.02
Present-Hedonistic (PrHe)	0.06	0.09
Present-Fatalistic (PrFa)	0.21 **	0.26 **
Future (Fu)	-0.12	-0.23 **
Future minus Present-Hedonistic	-0.12	-0.19 *
Future minus Present-Fatalistic	-0.20 *	-0.30 ***

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

As the second step, we computed how much people with low and high scores in various TP factors differed in playing time. We defined players under the 25<sup>th</sup> percentile in a certain factor as low-scorers; players above the 75<sup>th</sup> percentile in that factor as high-scorers. Table 3 shows means and mean differences in playing time for low-scorers and high-scorers in relevant TP factors. We obtained higher values in playing time from high-scorers in present factors and from low-scorers in future factor. Players who scored lower in future–present balance variables (their present score was relatively high compared with their future score) reported higher values in playing time. As presented in Table 3, some differences were significant.



Table 3: Low- and High-Scorers' Time Perspective Differences In Playing Time

	Low-scorers (n=39)		High-scorers (n=39)		Mean Difference
	Mean	SD	Mean	SD	
<b>Present-Hedonistic</b>					
Hours per week	25.83	15.79	27.49	16.06	-1.67
Hours per session	3.57	1.59	3.91	2.14	-0.35
<b>Present-Fatalistic</b>					
Hours per week	22.85	14.50	33.40	24.80	-10.54 *
Hours per session	3.48	1.81	5.26	3.34	-1.78 **
<b>Future</b>					
Hours per week	30.08	22.32	22.45	16.03	7.63
Hours per session	4.88	3.08	3.17	1.71	1.71 **
<b>Future minus Present-Hedonistic</b>					
Hours per week	29.36	22.59	24.13	16.52	5.22
Hours per session	4.59	3.12	3.42	1.73	1.17 *
<b>Future minus Present-Fatalistic</b>					
Hours per week	31.33	22.91	23.22	14.51	8.11
Hours per session	4.92	2.99	3.28	1.55	1.64 **

\* $p < 0.05$ , \*\* $p < 0.01$

## 2.1.4 Discussion and Conclusions

TP proved to be relevant for MMORPG playing. We demonstrated that different TP profiles relate to different frequencies of playing. Larger amounts of playing time correlates with lower level of future TP and higher levels of present TP, especially present fatalistic. This unbalance of present factors toward present fatalistic is worth of noting, because it constitutes a difference from reported studies on TP and drug abuse and gambling, where present hedonistic factor was demonstrated as the key variable. Present fatalistic is connected with dissatisfaction, aggression, and depression. We could hypothesize that people who spend significant time playing develop the present fatalistic orientation. However, it is more likely that people who already are present fatalistic play more, because playing helps to decrease their negative feelings. This would support Yee's suggestion that extensive playing is an indicator of mood management (Yee, 2006a). Regardless of motivation for playing, it seems that future orientation prevents extensive playing, probably via time managing skills. Time orientation is not available to a conscious mind and thus out of conscious control. This may be a reason why influencing playing time

can be difficult even for nonproblematic players. Time orientation measurement and modification hence could be an important first step in excessive playing interventions or a useful tool for players who just want to spend less time playing MMORPGs.

It should be noted that our results are not generally valid as our sample was self-selecting and consisted entirely of Czech and Slovak players and almost entirely of World of Warcraft players.

## 2.2 Study 2

### 2.2.1 Design and Hypotheses

The main objective of Study 2 was to empirically test the weight of predictors of MMORPG usage as they emerged from theoretical analysis presented in the first part of this thesis.

Via inventory-based research, I measured two dependent variables – Playing time and Problematic usage – and three predicting (explanatory) variables – Time perspective (Future positive TP and Negative TP), Habitual regulation (Contraplay cues sensitivity, Proplay cues sensitivity), and Conscious control of MMORPG usage (Control effort and Control success).

The conceptual framework is depicted in Figure 1.

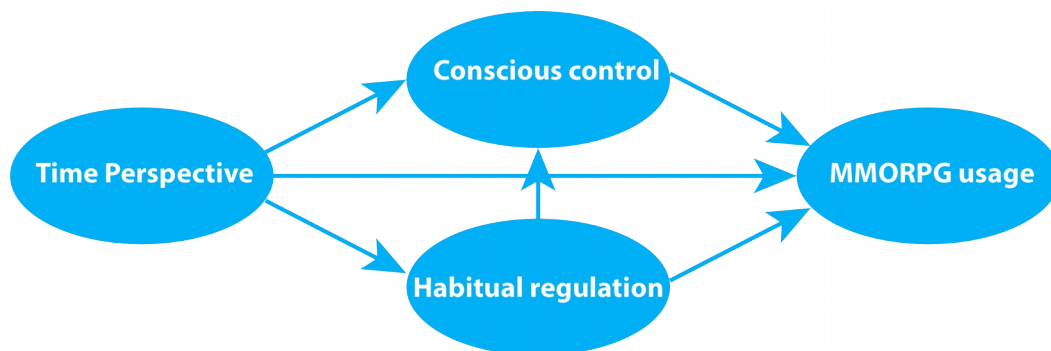


Figure 1. Conceptual framework of Study 2

Besides testing of the whole model (hypotheses 6a-r), some minor hypotheses had been proposed:

(1) According to still unestablished nature of relationship between excessive and addictive gaming, I included both variables into Study 2. In agreement with the majority of scholars, I presumed that excessive (time demanding) gaming might interfere more probably with other life activities and duties and therefore there would be a significant relationship between excessive and problematic gaming. I therefore hypothesize that *Playing time* measures would positively affect the occurrence of *Problematic usage* symptoms -. H1 (tested by linear regression analysis)

(2) Based on Study 1, I examined the relationships between Time Perspective factors (*Future Positive* and *Negative TP*) and the amount of time spent playing (*Playing time*) and the symptoms of Problematic usage (*Problematic usage*).

I presumed that Future Positive TP will be the significant negative predictor of Playing time (H2a) and Problematic usage (H2b) and Negative TP will be the significant positive predictor of Playing time (H2c) and Problematic usage (H2d); tested by linear regression analysis.

(3) According to theory of self-control strength, I presumed that those relationships between Time Perspective and MMORPG usage would not be direct but rather mediated through the quality of Self-control (*Control success*)

I presumed that *Future positive TP* would positively affect *Control success* (H3a), while *Negative TP* would affect *Control success* negatively (H3b). Further I presumed that *Control success* would significantly negatively affect both *Playing time* (H3c) and *Problematic usage* (H3d). I did expect that after including the *Control success*, no significant direct effects of *TPs* to *Playing time* and *Problematic usage* would be revealed, which would mean that the influence of TP on MMORPG usage is fully mediated through Control success (H3e, H3g for *Playing time*; H3f, H3h for *Problematic usage*). Hypothesized relationships are shown at Figure 2.

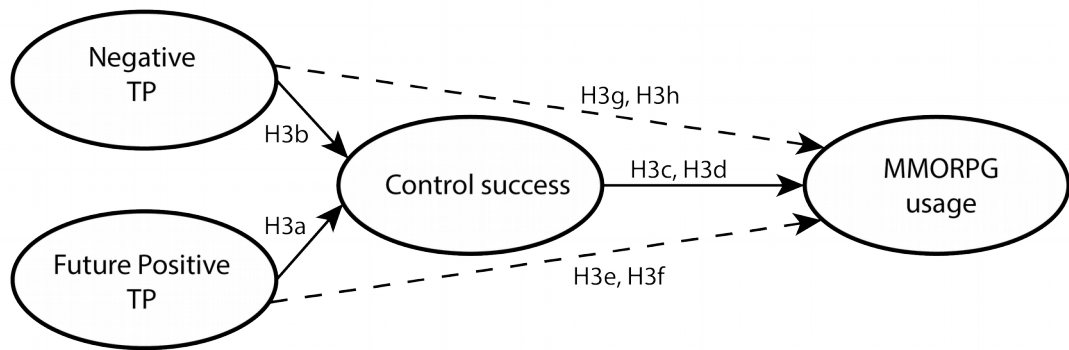


Figure 2. Schema of hypotheses 3a-3f.

(4) Developing the idea of the role of situational cues in habitual use (see Chapter 1.5), I proposed the measurement of habitual regulation based on cues sensitivity —Cues Sensitivity Scale (see Chapter 2.2.2 Methods). According to studies that showed the positive relationship between the strength of habitual regulation and media overuse, I presumed that Proplay cues sensitivity would encourage MMORPG usage. As the addition to this unidirectional approach toward habits in media use, I hypothesize also Contraplay cues sensitivity, that would decrease the usage.

I presume that Proplay cues sensitivity will positively affect Playing time (H4a) as well as Problematic usage (H4b), while Contraplay cues sensitivity will negatively affect both Playing time (H4c) and Problematic usage (H4d); tested by linear regression analysis.

(5) I presumed that the impact of Cues sensitivity on Problematic usage would be mediated through Playing time —that proplay habits would lead to high Playing time, which would cause the occurrence of problems in various life domains (Problematic usage) and contraplay habits would lead to low Playing time, which would prevent the occurrence of problems.

I presume that path coefficients between Contraplay cues sensitivity and Problematic usage and Proplay cues sensitivity and Problematic usage will decrease significantly after

including Playing time into the path model (H5a, H5b). Hypothesized relationships are shown at Figure 3.

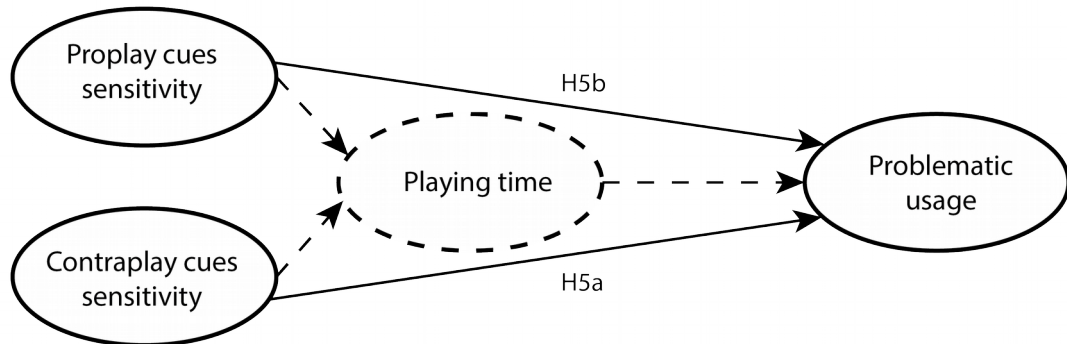


Figure 3. Schema of hypotheses 5a,b.

(6) Via combining all theoretical assumptions based on the first part of this thesis, I proposed the comprehensive model of conscious and habitual regulation and their effects on Problematic usage. I presumed the Zimbardo's time orientation to be the most general and stable factor (close to personality trait or cognitive habit) that affected Problematic usage, especially through its effect on Control success (positive effect of Future positive and negative effect of Negative TP). Control success together with Cues sensitivity are believed to be rather specific and proximal factors influencing MMORPG usage (both Playing time and Problematic usage). Given to conceptualization of Time perspective as general cognitive habits, I also hypothesized relationships between TP and Cues sensitivity, which is presumed to express habits related to MMORPG usage. According to knowledge on relationship between habitual and conscious regulation within media usage, I presume that Proplay cues sensitivity will significantly negatively affect Control success, because strong habitual use usually lead to weaker conscious self-regulation as the behavior gain the cue-response automaticity, resulting into lesser success of usage control. I believe that this negative influence will only be found for Proplay cues sensitivity, while Contraplay cues sensitivity fulfill the same goal as the conscious control (to play less). I therefore believe that there will be no significant path coefficient between Contraplay cues sensitivity and Control success. I presume that:

Control success will be positively affected by Future positive TP (H6a) and negatively affected by Negative TP (H6b).

Contraplay cues sensitivity will be positively affected by Future positive TP (H6c) and negatively affected by Negative TP (H6d).

Proplay cues sensitivity will be negatively affected by Future positive TP (H6e) and positively affected by Negative TP (H6f).

Control success will be negatively affected by Proplay cues sensitivity (H6g) and won't be affected by Contraplay cues sensitivity (H6h).

Playing time will be negatively affected by Control success (H6i), Contraplay cues sensitivity (H6j) and Future positive TP (H6k), and positively affected by Proplay cues sensitivity (H6l) and Negative TP (H6m). The effects of Time perspective factors on Playing time will be mediated through Control success and Cues sensitivity. The effects of Cues sensitivity on Playing time will be mediated through Control success.

Problematic usage will be negatively affected by Control success (H6n), Contraplay cues sensitivity (H6o) and Future positive TP (H6p), and positively affected by Proplay cues sensitivity (H6q) and Negative TP (H6r). The effects of Time perspective factors on Problematic usage will be mediated through Control success and Cues sensitivity. The effects of Cues sensitivity on Problematic usage will be mediated through Control success.

All hypothesized relationships are depicted at Figure 4.

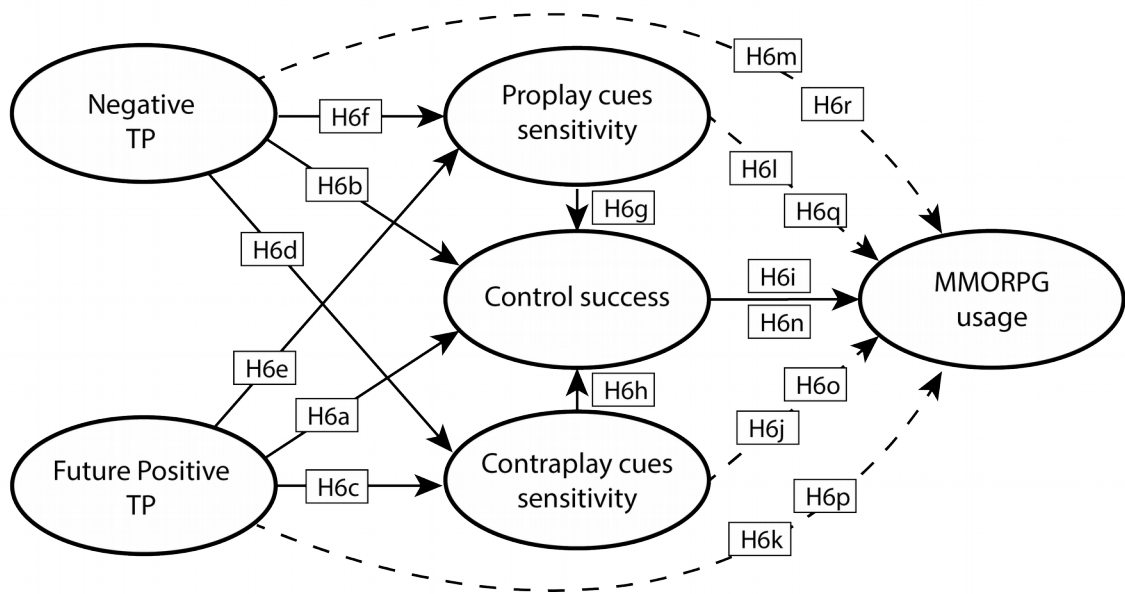


Figure 4. Schema of hypotheses 6a-r.

(7) The important theoretical implication of this study is the redefinition of habitual regulation and its impact on MMORPG usage. I believe that habits may lead either to excessive (respectively problematic) usage, or to prevent it. The major objection to this argument might be that contraplay cues sensitivity in fact reflects conscious regulation rather than habitual one (similarly proplay cues sensitivity would reflect the lack of conscious regulation). In my study I assessed the conscious regulation mainly as the presence (or absence) of the conscious decision to control the playing time (*Control effort*; item: “Do you try to control your playing time?”). Further I investigated how successful his control is according to himself (*Control success*) and whether he uses a strategy for controlling the time. In the comprehensive model of MMORPG usage I only used Control success variable, however I had some assumption concerning also Control effort.

I presumed that Control effort will affect MMORPG usage. I also supposed that Control effort will relate to Cues sensitivity.

Players that showed more Control effort will show lesser Playing time (H7a) and lesser Problematic usage (H7b); tested by ANOVA.

Players that showed more Control effort will show greater Contraplay cues sensitivity (H7c) and smaller Proplay cues sensitivity (H7d); tested by ANOVA.



## **2.2.2 Methods**

### **Data collection**

Participants were recruited online on the Czech Internet forums on MMORPGs and at the website for gaming fans (<http://games.tiscali.cz>). Forum posts and the article with the brief description of the research focus and the link to the online inventory were posted online. The online inventory for both studies was powered by the Google Forms platform. After a respondent answered the questions, he could submit his answers and he received an instant feedback to confirm the successful recording of data and to thank for his participation. Submitted answers were automatically collected in the spreadsheet, which only the researcher was able to access.

The inventory was in English to address the international sample of respondents that we could obtain. Respondents were alerted of the language of the questionnaire ahead in the recruiting text. The inventory contained the required question “How well did you understand the questions in the inventory?”. All respondents answered either “very well” or “well enough”.

The respondents were self-selected, they all agreed with the participation in the study (they were asked to confirm their agreement at the end of the online questionnaire, before submitting their answers) and they were promised no reward for their participation.

Respondents were asked to enter their email address if they want to be informed about results and/or participate in the follow-up study.

The data collection took place in Autumn 2012. Respondents that assigned their email address were contacted via email in the follow-up study in June 2015 and asked to fulfill the online questionnaire (powered by Google Forms), which was sent via email or available at the website via the sent link.

### **Sample**

In the Study 2, 415 respondents participated. Data from 23 respondents were removed from dataset because of missing values. 15 other respondents were removed because of positive markers of addiction to MMORPGs. To determine whether a

respondent's play was problematic (showed the symptoms of addiction to playing), we used Charlton's scale of core addiction (Charlton, 2002; the full scale is in Appendix, II). Based on Charlton and Danforth (2007) a player was categorized as addicted if he or she scored items in all four core criteria with at least a 4: withdrawal items (no. 7), relapse and reinstatement items (no. 5), at least one of the conflict items (no. 2, 3, 4) and at least one of the behavioral salience items (no. 1, 6). Players who did not score items in any of the four core criteria higher than 3 we considered to be non-addicted, casual players (135). The players that scored higher than 3 in some but not all criteria, we considered to be in the "gray zone", neither addict, nor casual (242) and left them in the dataset.

The final dataset consisted of 377 respondents (340 males, 30 females, 7 respondents did not entry their gender) with age from 12 to 67 years ( $M = 24.1$ ,  $SD = 6.8$ ). All respondents claimed to be active MMORPG players.

The dataset consists mainly of Czech (277) and Slovak (39), but also of people of other nationalities (17 Americans, 7 British, 4 Australians, 3 Germans, 2 Greeks, Dutch, Vietnamese and Portuguese, 1 Austrian, Belgian, Canadian, Caucasian, Polish, Swede, Swiss). 15 respondents did not stated their nationality.

## **Measures**

### **Problematic usage**

Charlton's scale of core addiction (Charlton, 2002) was used to assess Problematic usage. Scale consists of seven items, e.g. *Arguments have sometimes arisen at home because of the time I spend on MMORPGs*. Respondent is asked to express his level of agreement with each statement on the 1-5 scale. The average score was computed for each respondent.

## Playing time

Playing time was assessed the same way as in the Study 1, providing two measures — Hours per Week (Hpw) and Hours per Session (HpS). Moreover, we asked players to estimate how much percent of their free time they spend playing on the 10-points scale from “0-10%” to “91-100%” (Free time ratio, FTR).

## Time Perspective

Given to the enlargement of the inventory that needs to include more variables in Study 2, I feel pressed to shorten the original 56-items ZTPI. Therefore, the Czech short version of ZTPI was developed. According to the current debate on ZTPI, the Future-Negative scale was added into the inventory. The whole 18-items inventory in Czech and Slovak language was psychometrically tested on large representative samples of Czech (N=1027) and Slovak (N=1035) population (Košťál et al., 2015).

ZTPI-short measures six time perspective factors: Past-Positive, Past-Negative, Present-Hedonistic, Present-Fatalistic, Future-Positive (which is the same factor as “Future” in the original full-length ZPI), and Future-Negative. Each factor is assessed by three items. The full inventory is to be find in Appendix III.

## Sensitivity to cues

In order to investigate the habits connected with MMORPGs consumption, I developed the Cues Sensitivity Scale (CSS). In previous studies on habitual consumption, the habit’s strength was measured via self-reports inventory by LaRose et al. (2003). My aim was not only to measure the strength of habitual regulation (that is perceived to be opposite from the conscious regulation), but also its direction —if habits lead a player to consume the game or rather to cease the consumption.

Based on the self-experience, informal interviews with MMORPGs players and the analysis of the pilot 19-items version of CSS within the Study 1, I developed the 23-items inventory with two sub-scales: Proplay Cues Sensitivity (12) and Contraplay Cues Sensitivity (11). The full inventory is to be find in Appendix IV.

## Self-regulative effort and Control success

The presence of the self-regulative effort, we assessed through respondents' self-reports. They were asked, whether they try to control their playing time (item "Do you try to control how much time you spend playing MMORPGs?") and provided four answer options - "Not at all", "Rather not", "Sometimes yes", "Yes, ever or almost ever".

If respondent answered otherwise than "Not at all", he was also asked to indicate on the 1 to 9 scale, how successful he considered the control to be (item "How much do you think you are successful in the controlling of your playing time?").

## Using strategies

The use of strategies was investigated through the open-ended question: "What strategies do you use for controlling your playing time?" Respondents' answers were further analyzed by two independent researchers to decide, whether they really represent the strategy use or not. Strategies using therefore was a cardinal yes/no variable.

Moreover, researchers tried to estimated the strategy focus —whether the strategy is aimed to prevent the start of gaming session, or to stop the ongoing session, or both.

Finally, researchers tried to make the rough categorization of strategies into some few groups (e.g. using the watches to follow time passing; scheduling the playing session and apart from this scheduled time keep from playing; planning the other activities that would keep a player from playing), that could be used in the quantitative analysis. However, the variety of strategies was too large for such grouping, therefore I decided to make a proper qualitative analysis of strategies as a stand-alone study (Study 3).

## Age, Gender, Nationality, Employment-status, Family status and MMORPGs played

I also asked respondents to indicate some of their demographical characteristic such as Age (open question), Gender (multiple-choice question with three options: "Male", "Female", and one open option introduced as "Other"), Nationality (open question), Employment status (multiple-choice question with six options: "Student", "Employed",

“Unemployed”, “Retired”, “On maternity leave” and one open option introduced as “Other”), and Family status (multiple-choice question with three options: “Single”, “Married/In partnership”, and “Other”, and the open question “How many children do you have?”).

Apart from demographic information, we asked what MMORPG(s) a respondent currently played (open question “What MMORPG(s) do you play?”)

## **Data analysis procedure**

Data was analyzed statistically. Mainly linear regression analysis and Partial Least Squares Path Modeling (PLS-PM) were used . In the next paragraph, I will shortly introduce PLS-PM, because some readers might not be familiar with it.

### **Partial Least Squares Path Modeling**

Path Modeling is a statistical data analysis methodology that exists at the intersection of Regression Models, Structural Equation Models, and Multiple Table Analysis methods. It is usually used for studying complex multivariate relationships among observed and latent variables (Sanchez, 2013).

Partial Least Squares Path Modeling is the special case of Structural Equation Modeling, which is based on variance rather than covariance as it is usual in SEM, e.g. LISREL (Haenlein & Kaplan, 2004). PLS Path Modeling quantifies the relationships between variables by considering the network as a system of multiple interconnected linear regressions (Sanchez, 2013).

Using PLS Path Modeling (instead of covariance-based SEM, CBSEM) is especially recommended for models with collinear predictors (Haenlein and Kaplan, 2004). PLS path modeling enables researcher to measure the weight of direct and indirect relationships between variables. This is useful for models, where we expect that relationships between predictors and dependent variable are mediated by other variable. Using PLS-PM is also more appropriate than SEM within areas that are not yet boldly explored and theorized (limited prior knowledge), because the weights developed for each construct in PLS-PM take into account only those neighboring constructs it is structurally

connected (unlike in CBSEM, where all parameters can be biased by one misspecified path or inappropriate measurement). Thus, PLS-PM can be used also for testing of prior models that build on both new measures and structural paths (Chin, 2010, p.660).

Chin (2010) summarized the reasons for choosing PLS-PM over CBSEM as follows:

“...whether the researcher

- (1) Places less premium on explaining the covariances of all item measures,
- (2) Avoids negative impact due to errors in modeling or item usage,
- (3) Values soft distributional assumptions,
- (4) Sees the research not simply exploratory in nature, but interactive,
- (5) Has formative measurement items,
- (6) Requires flexibility in modeling higher order molar and molecular models,
- (7) Is interested in obtaining determinate scores/indices that are predictive
- (8) Has high model complexity,
- (9) Faces relatively smaller sample size,
- (10) Is less concerned with accuracy of parameter estimation or do not hold the belief in the notion of an underlying covariance based latent variable generating mechanism,
- (11) Wants to shift the perspective of a “true” model towards a prediction focus,, and
- (12) Values ease of model specification & model interpretation. (p. 668)

PLS-PM enable the researcher

(a) to examine how much of the variance of the dependent variable is explained via hypothetical independent (explanatory) variables, which is called the *coefficient of determination (R-square,  $R^2$ )* and it is the same as it in any other multiple regression analysis. The higher R-square is, the more variance of the dependent variable is explained by the independent ones. The R-square in PLS-PM can be classified in three categories:

1. Low:  $R^2 < 0.30$  (although some authors consider  $R^2 < 0.20$ )
2. Moderate:  $0.30 < R^2 < 0.60$  (alternatively  $0.20 < R^2 < 0.50$ )
3. High:  $R^2 > 0.60$  (alternatively  $R^2 > 0.50$ );

(Sanchez, 2013, p. 68)

(b) to examine the individual paths by showing the direct and indirect effects of the explanatory variable on the dependent variable, that are based on correlation analysis;

(c) assess the quality of measuring of latent variables in case there are measured by new untested instruments.

### **Comparing models**

PLS-PM focuses on explained variability for each dependent latent variable (LV). Therefore the explained variability (expressed by coefficient of determination, R-square) is the way how to assess the quality of the model. “The change in R-squares can be explored to see whether the impact of a particular independent LV on a dependent LV has substantive impact. “Specifically, the effect size  $f^2$  can be calculated as:

$$f^2 = \frac{R_{included}^2 - R_{excluded}^2}{1 - R_{included}^2}$$

where  $R^2_{included}$  and  $R^2_{excluded}$  are the R-squares provided on the dependent LV, when the predictor LV is used or omitted in the structural equation respectively.  $f^2$  of 0.02, 0.15, and 0.35, similar to Cohen (1988) operational definitions for multiple regression, can be viewed as a gauge for whether a predictor LV has a small, medium, or large effect at the structural level.” (Chin, 2010, p.675)

### **Mediating variables**

PLS-PM enables researcher to test whether effects of some predictors are mediated by other variables. According to Chin (2010, p. 678-679), “if the inclusion of a new construct

into a model changes the path of an existing construct from significant to non-significant, you have established full mediation for this new construct... Hypothetically, if we had found the direct effect from predictive variable to be smaller, but statistically significant, we would label proposed mediating variable as a partial mediator.”

The detailed description of PLS-PM can be found in the specialized sources (e.g., Sanchez, 2013; Esposito Vinci et al., 2010).

All statistical analyses were conducted in the free statistical software R (R Core Team, 2014). For path-modelling analyses, I used the R-package plspm (Sanchez, 2013).

### **2.2.3 Results: Study 2**

#### **Descriptive results for measured variables**

##### **Playing time**

###### **Hours per Week (HpW)**

The obtained values ranged from 2 to 100 hours spend playing weekly (M = 23.16, SD = 16.73, Median = 20; n = 377).

The distribution of values was a slightly sloped. Therefore, we conducted logarithmic adjustment to approximate normal distribution.

###### **Hours per Session (HpS)**

The obtained values for the length of usual gaming session varied from 0.5 to 17 hours (M = 3.79, SD = 2.21, Median = 3; n = 377).

As in the case of HpW, the distribution of the HpS values was slightly sloped and adjusted via logarithmic function to approximate normal distribution.



### **Free time ratio (FTR)**

Respondents indicated their FTR in the scale 0-10%, 11-20%, 21-30%, 31-40%, 41-50%, 51-60%, 61-70%, 71-80%, 81-90%, 91-100%. We represented each step of the ordinal scale with the middle value (e.g. 5 for 0-10%, 15 for 11-20%) and treated it as the ordinal variable.

Obtained results ranged from 5 to 95 ( $M = 41.26$ ,  $SD = 22.89$ ,  $Median = 35$ ,  $n = 377$ )

The distribution of FTR was close to normal distribution.

We examined how Playing time measures relates to each other. HpW and HpS correlated strongly ( $r = 0.69$ ,  $p < 0.001$ ), as well as HpW and FTR ( $\rho = 0.72$ ,  $p < 0.001$ ) and HpS and FTR ( $\rho = 0.65$ ,  $p < 0.001$ ).

### **Time Perspective (TP)**

We measured six TP factors. We obtained relatively low internal consistency for all factors: Past-Negative (Cronbach's alpha = 0.69), Past-Positive (Cronbach's alpha = 0.57), Present-Hedonistic (Cronbach's alpha = 0.49), Present-Fatalistic (Cronbach's alpha = 0.61), Future-Positive (Cronbach's alpha = 0.67), Future-Negative (Cronbach's alpha = 0.66). This is probably due to low number of items in each scale, combined with not very large sample of respondents ( $N=377$ ). However, Past-Negative, Future-Positive and Future-Negative internal consistencies are acceptable approaching the generally accepted value of 0.7 (Tavakol and Dennick, 2011).

On the basis of my view on Time perspective presented in the Part One of this thesis, I decided to make the composite factor Negative-TP that would consists of Past-Negative, Present-Fatalistic and Future-Negative. The internal consistency of Negative-TP was acceptable (Cronbach's alpha = 0.71).

The numerical summaries for all TP factors (including the composite Negative-TP factor) are in Table 4.

All TP factors approximated to the normal distribution.

Table 4: Numerical summaries for TP factors

	Min	Max	Mean	SD	Median
Past-Negative	1.00	5.00	2.93	1.00	3.00
Past-Positive	1.00	5.00	3.40	0.77	3.33
Present-Fatalistic	1.00	5.00	2.23	0.87	2.00
Present-Hedonistic	1.00	4.67	3.22	0.73	3.33
Future-Negative	1.00	5.00	2.50	0.91	2.33
Future-Positive	1.00	5.00	3.27	0.89	3.33
Negative-TP	1.00	4.78	2.55	0.69	2.56

We also measured correlations between TP factors (Table 5). The results confirmed the plausibility of the composite factor Negative-TP, while all correlations between its sub-factors (PaNe, PrFa, FuNe) were positive and significant ( $p < 0.001$ ). There were also found negative significant relations between FuPo and Negative-TP factor and its sub-factors as well.

Table 5: Pearson's Correlation Coefficients Between Time Perspective Factors

	PaNe	PaPo	PrFa	PrHe	FuNe	FuPo
Past-Negative	---					
Past-Positive	0.04	---				
Present-Fatalistic	0.20 ***	-0.05	---			
Present-Hedonistic	0.02	0.30 ***	-0.02	---		
Future-Negative	0.46 ***	-0.12 *	0.33 ***	0.02	---	
Future-Positive	-0.13 **	0.07	-0.14 **	-0.14 **	-0.38 ***	---
Negative-TP	0.77 ***	-0.06	0.66 ***	0.02	0.80 ***	-0.29 ***

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

## Sensitivity to Cues (SC)

We measured two SC factors, both revealed good internal consistency: Proplay cues sensitivity ("PCS", Cronbach's alpha = 0.78) and Contraplay cues sensitivity ("CCS" Cronbach's alpha = 0.75).

The obtained values for PCS ranged from 1.92 to 5 ( $M = 3.51$ ,  $SD = 0.63$ ,  $n = 377$ ), for CCS ranged from 1.2 to 4.8 ( $M = 3.28$ ,  $SD = 0.67$ ,  $n = 377$ ).

PCS and CCS are significantly negatively correlated ( $r = -0.39$ ,  $p < 0.001$ ), however the strength of correlation suggest they are independent variables.

Given to Cues Sensivity Scale is a new measure, more detailed psychometrical properties are presented in Tables 6 and 7.

*Table 6: Contraplay Cues Sensitivity Items Statistics*

		r.cor*	Mean	SD
CCS1	...I don't start playing if I have work to be done.	0.51	3.32	1.18
CCS2	...I don't start playing if I need to be well slept another day.	0.62	3.29	1.39
CCS3	...I don't start playing if I know I will play a lot next days (because of interesting event, new patch, friends...).	0.45	2.53	1.21
CCS4	...I don't start playing if I am asked to not play by someone close (e.g. partner, friend, parents, brother or sister).	0.60	3.49	1.29
CCS5	...I don't start playing if I am tired.	0.53	3.42	1.34
CCS6	I stop playing if the work to do appears.	0.54	3.62	1.10
CCS7	I stop playing if I achieve something important (e.g. level-up, equip, ...).	0.31	2.74	1.31
CCS8	I stop playing if I am asked to stop by a close person (e.g. partner, friend, parents, brother or sister).	0.60	3.76	1.21
CCS9	I stop playing if it is a time to go to bed.	0.55	3.35	1.39
CCS10	I stop playing if I am doing particulary poorly (little progress).	0.19	3.19	1.27
CCS11	I stop playing if the action (e.g. guild raid) I participated in is finished.	0.33	3.35	1.17

\*the correlation of the item with the entire scale corrects for the item overlap by subtracting the item variance but then replaces this with the best estimate of common variance

Table 7: Proplay Cues Sensitivity Items Statistics

		r.cor*	Mean	SD
PCS1	I start playing when I get home from school/work.	0.45	3.45	1.26
PCS2	I start playing if I know there is something interesting going on in the game (e.g. event, new patch...).	0.48	3.74	1.24
PCS3	I start playing when I need to relax.	0.31	4.15	1.01
PCS4	I start playing if I have nothing else to do.	0.33	4.07	1.06
PCS5	I start playing if a planned guild action starts.	0.44	3.36	1.42
PCS6	I start playing if I am angry or sad.	0.30	2.32	1.29
PCS7	...I do not stop playing if I have fun.	0.60	3.72	1.09
PCS8	...I do not stop playing if I am participating in a raid or a similar action.	0.54	3.85	1.14
PCS9	...I do not stop playing if I am on interesting mission/quest.	0.63	3.54	1.17
PCS10	...I do not stop playing if I am close to desired achievement (level, equip, mission, companion, talent...).	0.58	3.66	1.14
PCS11	...I do not stop playing if I am doing particulary well (huge progress).	0.64	3.41	1.22
PCS12	...I do not stop playing if I know I will not play next days for some reason.	0.51	2.82	1.34

\*the correlation of the item with the entire scale corrects for the item overlap by subtracting the item variance but then replaces this with the best estimate of common variance

## Self-regulative effort and Control success

We investigated whether players tried to control the amount of time spent playing and revealed that 120 participants responded “Not at all”, 62 respondents “Rather not”, 153 respondents “Sometimes yes” and 42 respondents “Yes, ever or almost ever”. To gain equally numbered groups, we grouped “Not at all” and “Rather not” answers into group “no” (182 respondents) and the other two answers into group “yes” (195 respondents).

The perceived effectivity of control was generally high, ranging from 1 to 9 ( $M = 6.76$ ,  $SD = 1.63$ , Median = 7,  $n = 256$ ), rising significantly with the rising regulative effort, measured by ANOVA ( $F = 8.721$ ,  $p < 0.001$ , see Table 8).

Table 8: Mean values of Control Success In Different Self-regulative Groups

Group	Mean	SD	n
Not at all	NA	NA	120
Rather not	6.11	1.94	62
Sometimes yes	6.82	1.49	153
Yes, ever or almost ever	7.41	1.56	42

## Strategies using

We registered strategies using in 145 respondents. We performed the detailed analysis of strategies within the Study 3.

## The hypotheses testing

### Hypothesis 1

The relationships between Playing time measures and Problematic usage were found positive, moderately strong and highly significant ( $p < 0.001$ ) for all Playing time measures as shown in Table 9.

Table 9: Pearson's Correlation Coefficients  
Between Playing time variables (HpW, HpS, FTR)  
and Problematic usage. N=377

	Problematic Usage
Free Time Ratio	0.41 ***
Hours per Week	0.39 ***
Hours per Session	0.35 ***

\*\*\* $p < 0.001$

The effect of Playing time measures (HpW, HpS and FTR, analyzed together) on Problematic usage was highly significant ( $p < 0.001$ ) in case of FTR and significant ( $p < 0.05$ ) in case of HpW, see Table 10, suggesting that FTR is the best predictor of Problematic usage among the Playing time measures. The coefficient of determination was

near to moderate ( $R^2 = 0.19$ ) suggesting that Playing time itself is important predictor but cannot sufficiently explain the whole variance in Problematic usage. **Hypothesis 1 was supported.**

*Table 10:* Linear regression analysis. Effect of Playing time measures on Problematic usage. N=377

Reference variable	Explanatory variables	Estimate	SE	T-value	R <sup>2</sup>
Problematic usage	FTR	0.01	0.00	<b>3.59 ***</b>	<b>0.188</b>
	HpW	0.16	0.07	<b>2.12 *</b>	
	HpS	0.12	0.09	<b>1.33</b>	

\* $p < 0.05$ , \*\*\* $p < 0.001$

## Hypotheses 2a-d

As the first step, we conducted correlation analyses of relationships between TP factors, Playing Time and Problematic usage. Some significant correlations were found, see Table 11.

*Table 11:* Pearson's Correlation Coefficients Between Playing time variables (HpW, HpS, FTR) and Problematic usage. N=377

	Future Positive TP	Negative TP
Free Time Ratio	-0.15 **	0.18 ***
Hours per Week	-0.12 *	0.17 ***
Hours per Session	-0.04	0.14 **
Problematic usage	-0.26 ***	0.31 ***

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

Via linear regression analysis, we analyzed the direct effect of both TP factors (Future positive TP and Negative TP) together on MMORPG usage. The results are shown in Table 12. Both Future positive TP and Negative TP predicted significantly ( $p < 0.001$ ) Problematic usage, reaching coefficient of determination  $R^2 = 0.12$ . Prediction of Playing time measures —Hours per Week, Hours per Session and Free Time Ratio —was analyzed

each separately and it was predicted significantly in all cases only by Negative TP. The obtained coefficients of determination were very low for all Playing time measures. **The hypothesis 2 was therefore supported partially** —both presumed TP factors predicted Problematic usage (hypotheses 2b and 2d were supported), but only Negative TP predicted significantly also Playing time (hypothesis 2c supported, hypothesis 2a unsupported).

Table 12: Linear regression results. Effect of Time Perspective factors on Playing time and Problematic usage. N=377

Reference variable	Explanatory variables	Estimate	SE	T-value	R <sup>2</sup>
HpW	Future Positive TP	-0.07	0.04	<b>-1.55</b>	<b>0.031</b>
	Negative TP	0.15	0.06	<b>2.69 **</b>	
HpS	Future Positive TP	-0.01	0.03	<b>-0.17</b>	<b>0.012</b>
	Negative TP	0.10	0.04	<b>2.32 *</b>	
FTR	Future Positive TP	-2.72	1.41	<b>-1.93</b>	<b>0.035</b>
	Negative TP	4.70	1.79	<b>2.62 **</b>	
Problematic usage	Future Positive TP	-0.08	0.02	<b>-3.92 ***</b>	<b>0.117</b>
	Negative TP	0.11	0.03	<b>4.38 ***</b>	

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

### Hypotheses 3a-h

Further we presumed that the effect of TP on Playing time and Problematic usage would be rather indirect, mediated by the effectivity of player's control of usage (Control success). On the subsample of 256 respondent, who stated they tried to control their playing time, the path-modelling analyses were conducted with TP factors as predictors of Control success and Playing time, respectively Control success and Problematic usage (see Figure 2 in section 2.2.1). In both cases (Playing Time and Problematic usage), two models were computed —with and without direct paths between TP variables and usage variables to assess how much the amount of explained variance differ by adding the direct paths between TP and usage. Measurement models for path-models showed in Figures 5-9 are in Appendix V.

As was expected, Control success depended significantly on the both TP factors, more on the Future Positive TP. The coefficient of determination that expressed the amount

of variance in Control success explained by TP factors was rather low ( $R^2=0.144$ , respectively 0.146), suggesting that TP alone is relevant but not sufficient predictor of Control success (see Figure 5, Table 13). **Hypotheses 3a and 3b were supported.**

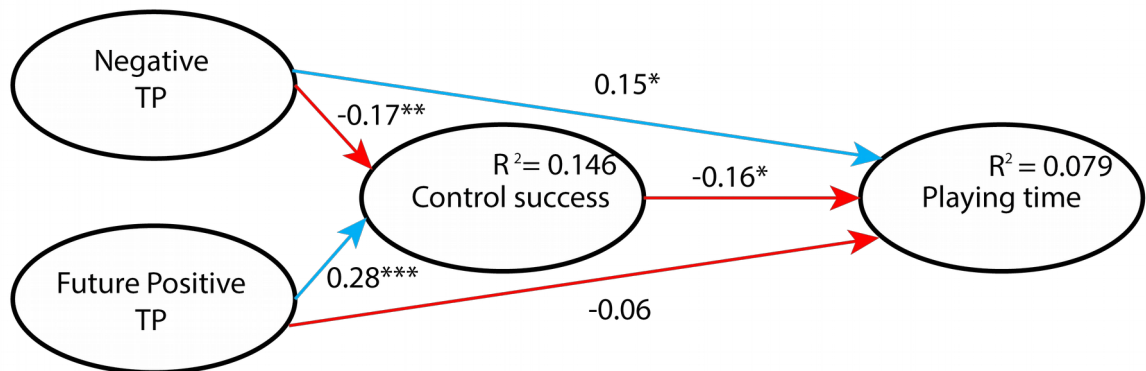


Figure 5. Structural model with path coefficients. The effects of TP factors and Control success on Playing time (full model); N=256.  
\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

Table 13: Path-model results. The effects of TP on Control success and Playing time (full model)

Reference variable	Explanatory variables	Estimate	SE	T-value	Total effect	Direct effect	Indirect effect	R2
Control success	Future Positive TP	0.28	0.06	<b>4.46</b>	0.28	<b>0.28 ***</b>		<b>0.146</b>
	Negative TP	-0.17	0.06	<b>-2.72</b>	-0.17	<b>-0.17 **</b>		
Playing Time	Future Positive TP	-0.06	0.07	<b>-0.89</b>	-0.11	<b>-0.06</b>	-0.04	<b>0.079</b>
	Negative TP	0.15	0.07	<b>2.29 *</b>	0.18	<b>0.15 *</b>	0.03	
	Self-control	-0.16	0.07	<b>-2.36 *</b>	-0.16	<b>-0.16 *</b>		

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

The effect of Control success on Playing time was rather weak, although significant ( $r=-0.16$ ,  $p < 0.05$ ). **Hypothesis 3c was supported. Hypothesis 3g**, supposing that Negative TP affected Playing time through the Control success, **was not supported**. As shown in Table 13, indirect effect of Negative TP on Playing time was very low. Negative TP showed significant direct effect on Playing time, even with Control success included into model. As revealed within hypothesis 2, the direct effect of Future positive



TP on Playing time was insignificant, thus the question whether the effect is mediated or not (hypothesis 3e) is not relevant.

Generally, TP factors together with Control success were able to predict only a small amount of Playing time variability ( $R^2 = 0.08$ ). By removing direct paths between TP factors and Playing time, the coefficient of determination for Playing time decreased to 0.05, see Figure 6, which also indicated that **the effect of TP on Playing time is only partially mediated through Control success.**

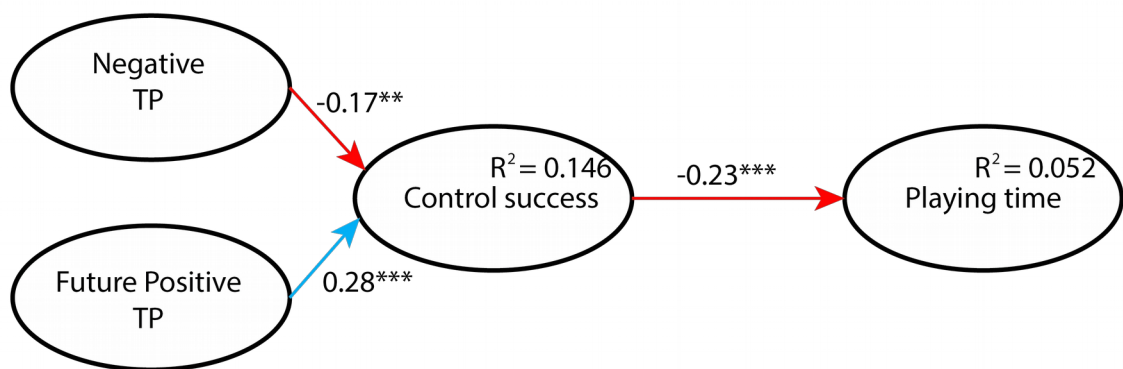


Figure 6. Structural model with path coefficients. The effects of TP on Control success and Playing time (plain model); N=256.  
\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

The proposed model showed better explanatory power for the Problematic usage. Both TP factors affected significantly Problematic usage ( $p < 0.01$ ) in presumed directions even when Control success as the mediating variable was included in the model. Again, the indirect effects were low in contrast to expectations. However, in the full model (with direct paths between TP and Problematic usage), Control success itself affected Problematic usage significantly ( $p < 0.001$ ) and together with TP factors constituted moderately strong coefficient of determination ( $R^2 = 0.24$ ), see Figure 7 and Table 14. Removing direct paths between TP factors and Problematic usage led to a decrease in the coefficient of determination to  $R^2 = 0.17$  and the direct effect of Control success on Problematic usage increased from  $r = -0.29$  to  $r = -0.42$  ( $p < 0.001$ ), suggesting that **the effect of TP on Problematic usage is partially mediated through Control success**, see Figure 8.

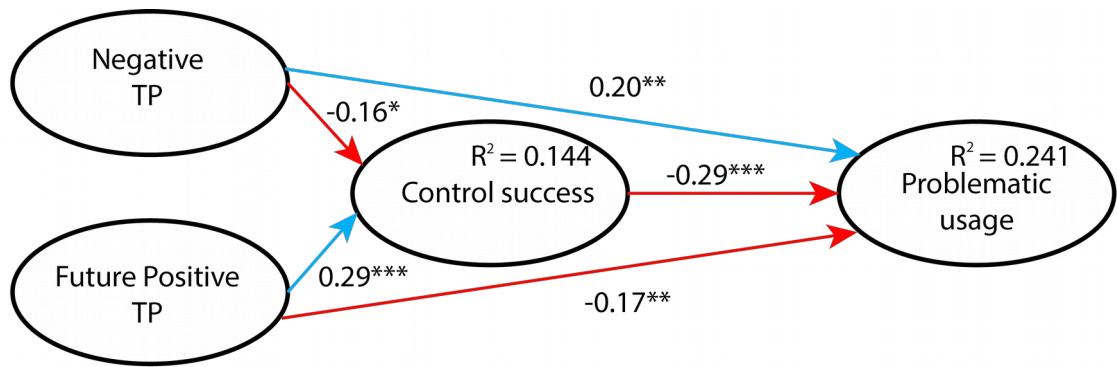


Figure 7. Structural model with path coefficients. The effects of TP on Control success and Problematic usage (full model); N=256.

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

Table 14: Path-model results. The effects of TP on Control success and Problematic usage (full model)

Reference variable	Explanatory variables	Estimate	SE	T-value	Total effect	Direct effect	Indirect effect	R <sup>2</sup>
Control success	Future Positive TP	0.29	0.06	<b>4.55 ***</b>	0.29	<b>0.29 ***</b>		<b>0.144</b>
	Negative TP	-0.16	0.06	<b>-2.50 *</b>	-0.16	<b>-0.16 *</b>		
Problematic usage	Future Positive TP	-0.17	0.06	<b>-2.48</b>	-0.25	<b>-0.17 **</b>	-0.08	<b>0.241</b>
	Negative TP	0.20	0.06	<b>3.36 ***</b>	0.25	<b>0.20 ***</b>	0.05	
	Control success	-0.29	0.06	<b>-5.06 ***</b>	-0.29	<b>-0.29 ***</b>		

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

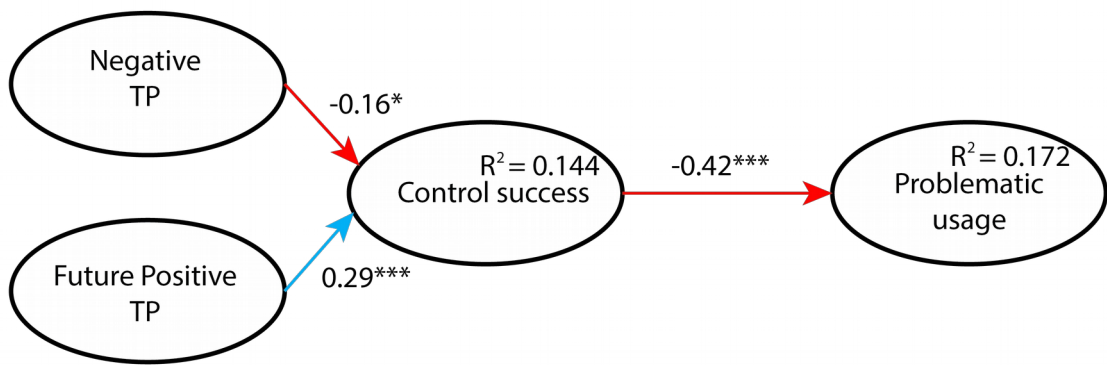


Figure 8. Structural model with path coefficients. The effects of TP on Control success and Problematic usage (plain model); N=256.  
\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

To examine thoroughly, the mediating effect of Control success on Problematic usage, a model with only TP predictors was tested, see Figure 9. Path coefficients between TP and Problematic usage were higher and more significant ( $p<0.001$ ) than within the full model (Figure 7), which further confirmed that the effect of TP on Problematic usage is partially mediated. **Hypotheses 3f and 3h are therefore partially supported.**

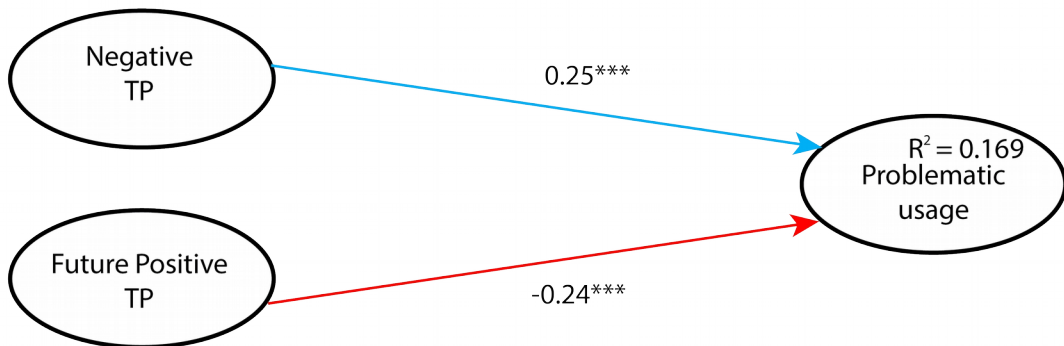


Figure 9. Structural model with path coefficients. The effects of TP on Problematic usage (model without Control success); N=256.  
\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

## Hypotheses 4a-d

I presumed that Cues sensitivity reflect the habits related to gaming. Contrary to dominant reasoning, we presumed that habits related with gaming may either lead to or prevent excessive (or problematic) gaming. Thus we proposed two cues sensitivity factors - Proplay cues sensitivity (PCS) and Contraplay cues sensitivity (CCS) and expected they would affect Playing time and Problematic usage in opposite ways. This was confirmed via correlation analysis, see Table 15.

*Table 15: Pearson's Correlation Coefficients Between Cues sensitivity and MMORPG usage. N=377*

	Problematic usage	FTR	HpW	HpS
Proplay cues sensitivity	0.45 ***	0.45 ***	0.40 ***	0.34 ***
Contraplay cues sensitivity	-0.48 ***	-0.42 ***	-0.40 ***	-0.37 ***

\*\*\* $p < 0.001$

The second step was to assess how much variance of Playing time and Problematic usage can be explained via Cues sensitivity and whether both CS factors are significant predictors of Problematic usage. The linear regression analysis has been made for all Playing time measures and Problematic usage measure. We obtained a moderate coefficient of determination for all variables, except from Hour per Session (see Table 16) and both CS factors (analyzed together) were found to be significant predictors ( $p < 0.001$ ) of all Playing time measures and Problematic usage. **Hypotheses 4a-d were thus supported.**

Table 16: Linear regression results. Effect of Cues sensitivity on Playing time and Problematic usage. N=377

Reference variable	Explanatory variables	Estimate	SE	T-value	R <sup>2</sup>
Hours per Week	Proplay cues sensitivity	0.32	0.06	<b>5.37 ***</b>	<b>0.216</b>
	Contraplay cues sensitivity	-0.29	0.06	<b>-5.18 ***</b>	
Hours per Session	Proplay cues sensitivity	0.18	0.04	<b>4.06 ***</b>	<b>0.161</b>
	Contraplay cues sensitivity	-0.20	0.04	<b>-4.76 ***</b>	
Free time ratio	Proplay cues sensitivity	12.85	1.83	<b>7.04 ***</b>	<b>0.262</b>
	Contraplay cues sensitivity	-8.30	1.72	<b>-4.82 ***</b>	
Problematic usage	Proplay cues sensitivity	0.33	0.06	<b>5.80 ***</b>	<b>0.292</b>
	Contraplay cues sensitivity	-0.37	0.05	<b>-7.01 ***</b>	

\*\*\* $p < 0.001$

## Hypotheses 5a-b

Unlike previously examined predictors (TP factors, Control success), CS factors seemed to be effective not only for predicting of Problematic usage but also for predicting of Playing time. Given to that correlation coefficients found between CS factors and Playing time measures and Problematic usage was similarly strong (Table 15), there was a possibility that the effect of CS factors on Problematic usage was mediated through Playing time. Path analysis was conducted to see whether the effect of CS factors on Problematic usage was direct or rather mediated through Playing time (see Hypotheses section, Figure 3). Two models were computed —model without Playing time (see Figure 10) and “full model” with direct paths between CS factors and Problematic usage as well as with paths between CS factors, Playing time and path between Playing time and Problematic usage (Figure 11) to see whether there will be the decrease in significance in path coefficients between CS factors and Problematic usage after including of Playing

time. Measurement models for path-models showed in Figures 10 and 11 are in Appendix VI.

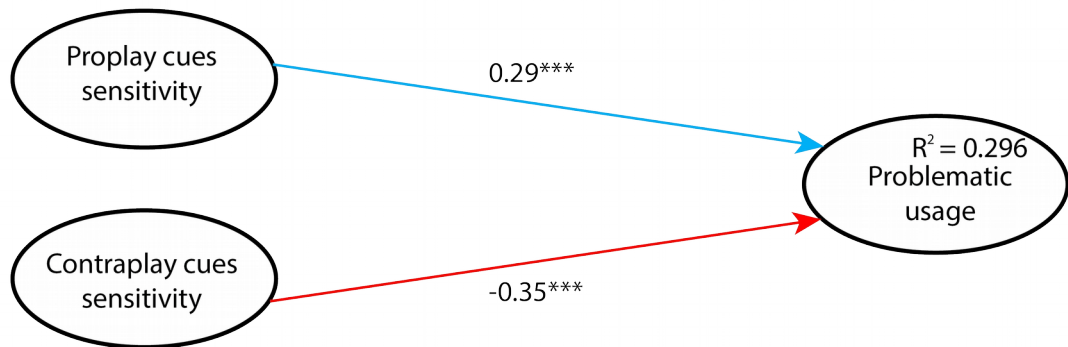


Figure 10. Structural model with path coefficients. The effects of Cues sensitivity on Problematic usage (model without Playing time); N=377.

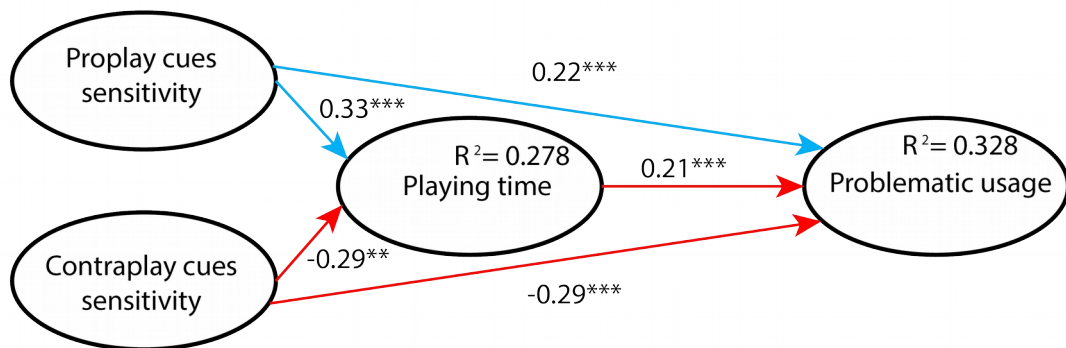


Figure 11. Structural model with path coefficients. The effects of Cues sensitivity on Playing time and Problematic usage (full model); N=377.

As shown in Figure 11 and Table 17, after including of Playing time as mediating variable, path coefficients between CS factors and Problematic usage decreased, but remained highly significant ( $p < 0.001$ ), suggesting that the effect of Cues sensitivity on Problematic

usage is only partially mediated by Playing time. **Hypotheses 5a and 5b were therefore not supported.**

Both examined models showed moderate amount of explained variability for Problematic usage (moderate  $R^2$ ). The coefficient of determination in full model was moderate also in case of Playing time ( $R^2 = 0.278$ ), suggesting that Cues sensitivity is a good predictor of both Playing time and Problematic usage.

*Table 17: Path-model results. The effects of Cues sensitivity on Playing time and Problematic usage (full model).*

Reference variable	Explanatory variables	Estimate	SE	T-value	Total effect	Direct effect	Indirect effect	$R^2$
Playing time	Proplay cues sensitivity	0.33	0.05	6.53 ***	0.33	<b>0.33 ***</b>		<b>0.278</b>
	Contraplay cues sensitivity	-0.29	0.05	-5.73 ***	-0.29	<b>-0.29 ***</b>		
Problematic usage	Proplay cues sensitivity	0.22	0.05	4.25 ***	0.29	<b>0.22 ***</b>	0.07	<b>0.328</b>
	Contraplay cues sensitivity	-0.29	0.05	-5.66 ***	-0.35	<b>-0.29 ***</b>	-0.06	
	Playing time	0.21	0.05	4.13 ***	0.21	<b>0.21 ***</b>		

\*\*\* $p < 0.001$

### Hypotheses 6a-r: The comprehensive model of MMORPG usage

The comprehensive model of MMORPG usage with all proposed predicting and mediating variables was tested independently for both MMORPG usage variables – Problematic usage (Figure 12, Table 18) and Playing time (Figure 13, Table 19; revised models results are shown in Figures 14 and 15 and Tables 20 and 21). Measurement models for path-models showed in Figures 12-15 are in Appendix VII.

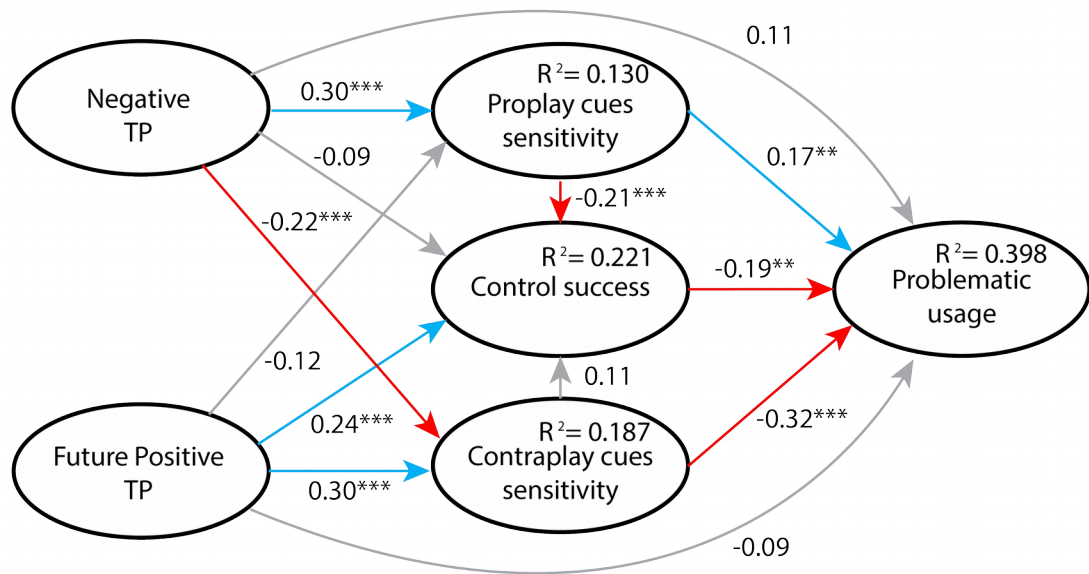


Figure 12. Structural model with path coefficients. The effects of TP on Cues sensitivity, Control success and Problematic usage (full model); N=256.  
 \*\* $p < 0.01$ , \*\*\* $p < 0.001$

Results for model depicted at Figure 12 (Table 18) showed that proposed predictors were able to explain a moderate amount of variability in Problematic usage ( $R^2 = 0.398$ ). The coefficient of determination for other endogenous variables were between low and moderate. In sum 14 paths has been tested within the model and 8 had been found statistically significant. Contraplay cues sensitivity is positively affected by Future positive TP (H6c supported) and negatively by Negative TP (H6d supported). Proplay cues sensitivity however was significantly affected only by Negative TP (H6f supported) but not by Future positive TP (H6e not supported). Control success was significantly positively affected by Future positive (H6a supported), but was not affected significantly by Negative TP (H6b not supported). It seemed that the **effect of Negative TP on Control success was mediated through Proplay cues sensitivity**, because in previous analysis without Cues sensitivity the effect was significant (see Table 14). As presumed Control success was significantly negatively affected by Proplay cues sensitivity (H6g supported) and not affected significantly by Contraplay cues sensitivity (H6h supported). Problematic usage was not significantly directly affected by Time perspective (H6p and H6r not supported). **The effect of Time perspective on Problematic usage was partially mediated through**



**Control success** (as shown earlier, see Figures 7 and 9) **and partially through Cues sensitivity** (the effect of Future positive TP was mediated through Contraplay cues sensitivity and the effect of Negative TP was mediated through Proplay cues sensitivity). Control success affected Problematic usage significantly negatively (H6n supported), as well as Contraplay cues sensitivity (H6o supported). Proplay cues sensitivity affected Problematic usage significantly positively (H6q supported).

Table 18: Path-model results. The effects of TP on Cues sensitivity, Control success and Problematic usage (full model).

Reference variable	Explanatory variables	Estimate	SE	T-value	Total effect	Direct effect	Indirect effect	R2
Contraplay cues sensitivity	Future Positive TP	0.30	0.06	<b>4.76 ***</b>	0.30	<b>0.30 ***</b>		<b>0.187</b>
	Negative TP	-0.22	0.06	<b>-3.51 ***</b>	-0.22	<b>-0.22 ***</b>		
Proplay cues sensitivity	Future Positive TP	-0.12	0.07	<b>-1.79</b>	-0.12	<b>-0.12</b>		<b>0.130</b>
	Negative TP	0.30	0.07	<b>4.64 ***</b>	0.30	<b>0.30 ***</b>		
Control success	Future Positive TP	0.24	0.07	<b>3.72 ***</b>	0.30	<b>0.24 ***</b>	0.06	<b>0.221</b>
	Negative TP	-0.09	0.07	<b>-1.45</b>	-0.18	<b>-0.09</b>	-0.09	
	Contraplay cues sensitivity	0.11	0.07	<b>1.58</b>	0.11	0.11		
Problematic usage	Proplay cues sensitivity	-0.21	0.07	<b>-3.08 ***</b>	-0.21	<b>-0.21 ***</b>		<b>0.398</b>
	Future Positive TP	-0.09	0.06	<b>-1.50</b>	-0.27	<b>-0.09</b>	-0.18	
	Negative TP	0.11	0.06	<b>1.83</b>	0.27	<b>0.11</b>	0.16	
	Contraplay cues sensitivity	-0.32	0.06	<b>-5.23 ***</b>	-0.34	<b>-0.32 ***</b>	-0.02	
	Proplay cues sensitivity	0.18	0.06	<b>2.90 **</b>	0.22	<b>0.17 **</b>	0.04	
	Control success	-0.19	0.06	<b>-3.33 **</b>	-0.19	<b>-0.19 **</b>		

\*\* $p < 0.01$ , \*\*\* $p < 0.001$

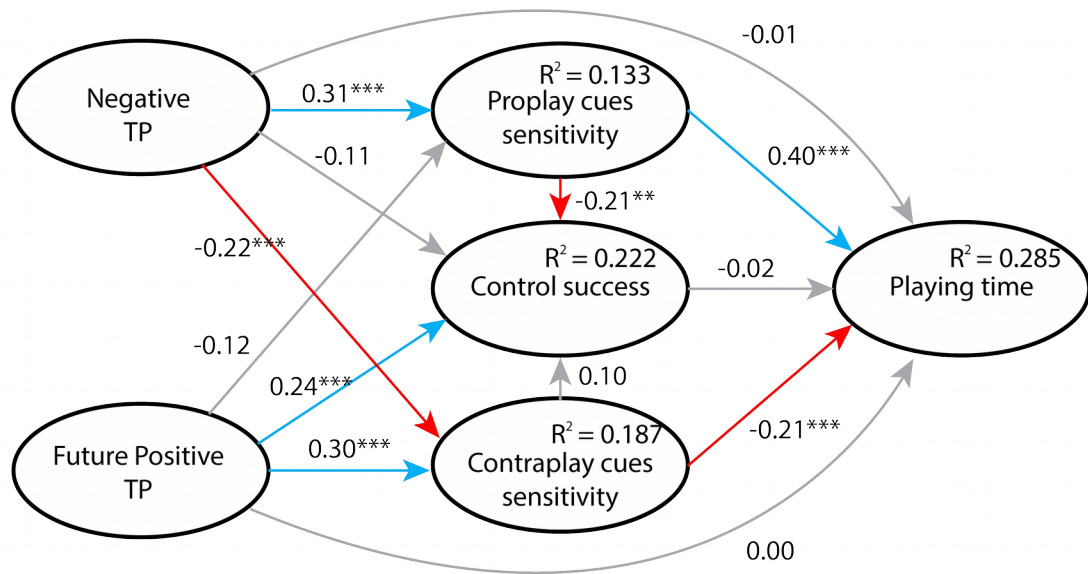


Figure 13. Structural model with path coefficients. The effects of TP on Cues sensitivity, Control success and Playing time (full model); N=256.

Results for model depicted at Figure 13 (Table 19) showed that proposed explanatory variables were together able to explain a moderate amount of variance in Playing time ( $R^2 = 0.285$ ). Either Time Perspective factors or Control success showed no significant direct effect on Playing time (H6i, H6k and H6m not supported). Only significant direct predictors were Contraplay cues sensitivity (H6j supported) and Proplay cues sensitivity (H6l supported). Therefore, the simpler model without Control success was tested (Figure 14, Table 20). TP factors were remained in model as significant CS predictors. As presumed, the coefficient of determination remained the same after excluding Control success and direct paths between TP factors and Playing time ( $R^2 = 0.285$ ) suggesting that the final simpler model holds the same predictive power.

Table 19: Path-model results. The effects of TP on Cues sensitivity, Control success and Playing time (full model). N=256.

Reference variable	Explanatory variables	Estimate	SE	T-value	Total effect	Direct effect	Indirect effect	R2
Contraplay cues sensitivity	Future Positive TP	0.30	0.06	<b>4.78 ***</b>	0.30	<b>0.30 ***</b>		<b>0.187</b>
	Negative TP	-0.22	0.06	<b>-3.52 ***</b>	-0.22	<b>-0.22 ***</b>		
Proplay cues sensitivity	Future Positive TP	-0.12	0.07	<b>-1.77</b>	-0.12	<b>-0.12</b>		<b>0.133</b>
	Negative TP	0.31	0.07	<b>4.72 ***</b>	0.31	<b>0.31 ***</b>		
Control success	Future Positive TP	0.24	0.07	<b>3.63 ***</b>	0.29	<b>0.24 ***</b>	0.06	<b>0.222</b>
	Negative TP	-0.11	0.07	<b>-1.62</b>	-0.19	<b>-0.11</b>	-0.09	
	Contraplay cues sensitivity	0.10	0.07	<b>1.51</b>	0.10	<b>0.10</b>		
	Proplay cues sensitivity	-0.21	0.07	<b>-3.15 **</b>	-0.21	<b>-0.21 **</b>		
Playing time	Future Positive TP	0.00	0.06	<b>0.02</b>	-0.12	<b>0.00</b>	-0.12	<b>0.285</b>
	Negative TP	-0.01	0.06	<b>-0.24</b>	0.16	<b>-0.01</b>	0.18	
	Contraplay cues sensitivity	-0.21	0.07	<b>-3.21 ***</b>	-0.22	<b>-0.21 ***</b>	0.00	
	Proplay cues sensitivity	0.40	0.07	<b>6.09 ***</b>	0.41	<b>0.40 ***</b>	0.01	
	Control success	-0.02	0.06	<b>-0.38</b>	0.00	<b>-0.02</b>		

\*\* $p < 0.01$ , \*\*\* $p < 0.001$

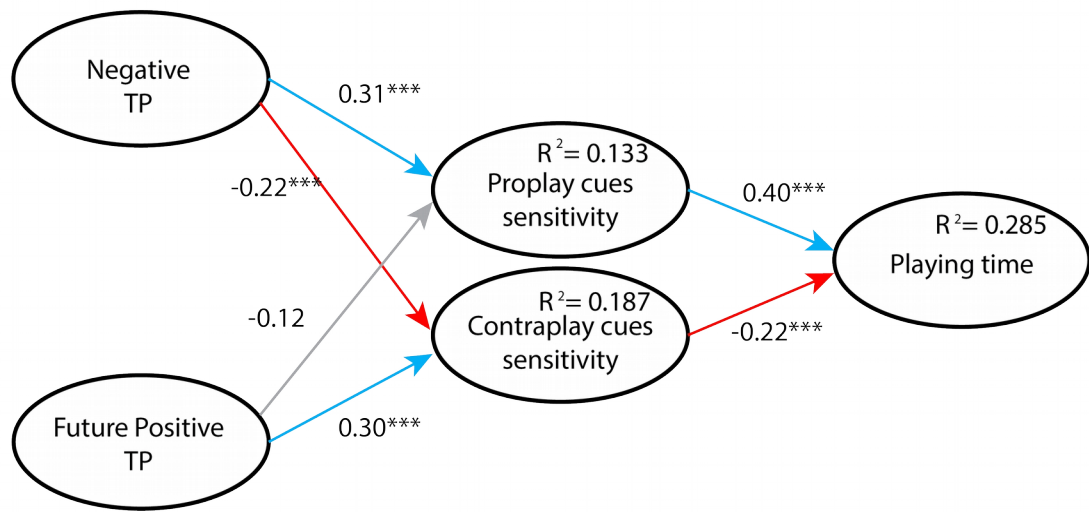


Figure 14. Structural model with path coefficients. The effects of TP on Cues sensitivity and Playing time (revised model without Control success); N=256.

Table 20: Path-model results. The effects of TP on Cues sensitivity and Playing time (revised model without Control success). N=256

Reference variable	Explanatory variables	Estimate	SE	T-value	Total effect	Direct effect	Indirect effect	R <sup>2</sup>
Contraplay cues sensitivity	Future Positive TP	0.30	0.06	<b>4.78 ***</b>	0.30	<b>0.30 ***</b>		<b>0.187</b>
	Negative TP	-0.22	0.06	<b>-3.52 ***</b>	-0.22	<b>-0.22 ***</b>		
Proplay cues sensitivity	Future Positive TP	-0.12	0.07	<b>-1.77</b>	-0.12	<b>-0.12</b>		<b>0.133</b>
	Negative TP	0.31	0.07	<b>4.72 ***</b>	0.31	<b>0.31 ***</b>		
Playing time	Contraplay cues sensitivity	-0.22	0.06	<b>-3.48 ***</b>	-0.22	<b>-0.22 ***</b>		<b>0.285</b>
	Proplay cues sensitivity	0.40	0.06	<b>6.49 ***</b>	0.40	<b>0.40 ***</b>		
	Future Positive TP				-0.112		-0.112	
	Negative TP				0.172		0.172	

\*\*\*p<0.001

Revised model was tested also on the complete dataset (including non-controlling players, N=377) and showed similar results, see Figure 15 and Table 21, still explaining a moderate amount of variability in Playing time.

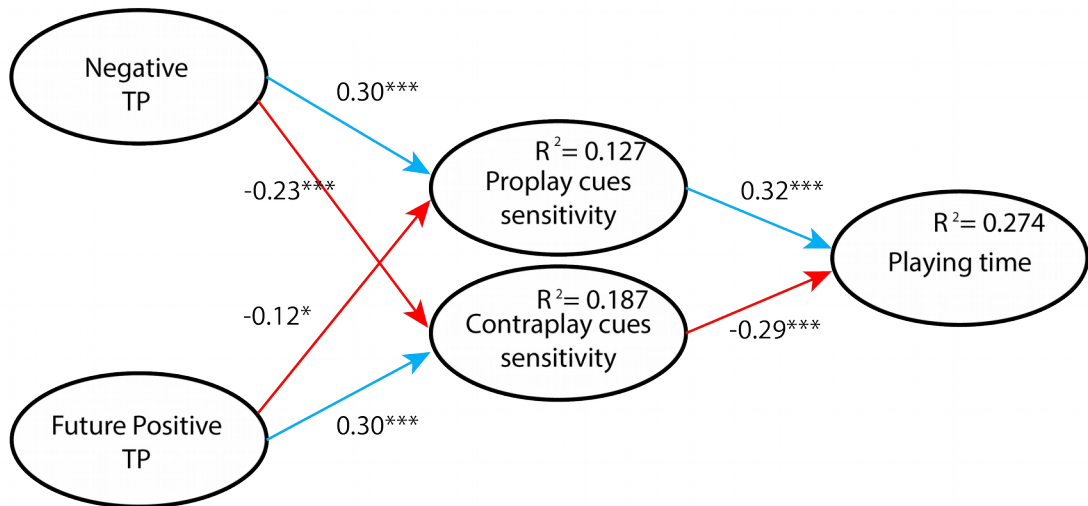


Figure 15. Structural model with path coefficients. The effects of TP on Cues sensitivity and Playing time (revised model without Control success); N=377.  
 \* $p < 0.05$ , \*\*\* $p < 0.001$

Table 21: Path-model results. The effects of TP on Cues sensitivity and Playing time (revised model without Control success). N=377

Reference variable	Explanatory variables	Estimate	SE	T-value	Total effect	Direct effect	Indirect effect	R <sup>2</sup>
Contraplay cues sensitivity	Future Positive TP	0.30	0.05	<b>5.97 ***</b>	0.30	<b>0.30 ***</b>		<b>0.187</b>
	Negative TP	-0.23	0.05	<b>-4.50 ***</b>	-0.23	<b>-0.23 ***</b>		
Proplay cues sensitivity	Future Positive TP	-0.12	0.05	<b>-2.28 *</b>	-0.12	<b>-0.12 *</b>		<b>0.127</b>
	Negative TP	0.30	0.05	<b>5.70 ***</b>	0.30	<b>0.30 ***</b>		
Playing time	Contraplay cues sensitivity	-0.29	0.05	<b>-5.69 ***</b>	-0.29	<b>-0.29 ***</b>		<b>0.274</b>
	Proplay cues sensitivity	0.32	0.05	<b>6.25 ***</b>	0.32	<b>0.32 ***</b>		
	<i>Future Positive TP</i>				-0.128		-0.128	
	<i>Negative TP</i>				0.164		0.164	

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

## Hypotheses 7a-d

Control success had been proved to be significant predictor of Problematic usage. Apart from Control success, other variables related to conscious regulation had been measured, namely Controlling effort and Using of strategies for time control. The further relationships between conscious regulation variables and other variables (MMORPG usage, CS, TP) were analyzed.

### Controlling effort and MMORPG usage

As presumed, there had been found significant difference in Problematic usage between controlling and non-controlling players (ANOVA,  $F(3, 373) = 5.774$ ,  $p < 0.001$ ); see Table 22. Surprisingly, the most problematic players were not those who did not control their playing time at all (“Not at all” group), but those that **rather** did not control it (“Rather not” group). And even players, who sometimes control their playing time (“Sometimes yes”) scored on average in Problematic usage higher than “Not at all” group.

Table 22: Mean comparison in Problematic usage between groups with different level of playing time control effort. N=377

	Mean	SD	N
Not at all	2.07	0.66	120
Rather not	2.45	0.85	62
Sometimes yes	2.27	0.71	153
Ever	1.99	0.58	42

Similar pattern was revealed for Playing time measures — see Table 23. The difference between groups was significant only in case of FTR ( $F(3,373)=3.289$ ,  $p<0.05$ ). In case of Hpw and Hps, the difference between groups was not significant ( $F(3,373)=2.491$ ,  $p=0.060$ ;  $F(3,373)=1.421$ ,  $p=0.236$ ).

Table 23: Mean comparison in Playing time between groups with different level of playing time control effort; N=377.

	Hours per week		Hours per session		FTR		N
	Mean	SD	Mean	SD	Mean	SD	
Not at all	24.14	18.42	3.93	2.36	43.17	24.73	120
Rather not	26.98	18.89	4.15	2.60	46.13	23.55	62
Sometimes yes	22.08	14.90	3.65	1.91	40.10	20.84	153
Ever	18.62	13.33	3.37	2.10	32.86	21.70	42

The presumed relationships that more regulative effort lead to less MMORPG usage was confirmed only partially (hypotheses 7a, b not supported). **It had been found that there is a group of players, which are relatively unproblematic and non-excessive, despite they do not control deliberately their playing time.**

### Controlling effort and Cue sensitivity

The unexpected results of hypotheses 7a,b could be explained via Cues sensitivity concept - the habitual regulation of usage that is supposed to be a factor influencing MMORPG usage independent on conscious control.

Analysis of the relationship between Controlling effort and Cue sensitivity was also important for the sake of construct validity of Cue sensitivity scale, to prove its independency on conscious self-regulation. Proplay cues sensitivity (PCS) correspond with

the major conceptualization of habitual regulation as the tendency to automatically start and continue some activity. Contraplay cues sensitivity (CCS) however express rather tendency to stop the activity or prevent oneself from doing it, which are functions traditionally ascribed to self-regulation or self-control.

I conducted ANOVA to see the pattern of CCS and PCS in different controlling groups. Differences between controlling groups were significant in both CS factors (CCS:  $F(3,373)=4.965$ ,  $p<0.01$ ; PCS:  $F(3,373)=3.923$ ,  $p<0.01$ ). In case of PCS, the differences between first three controlling groups (“Not at all”, “Rather not”, “Sometimes yes”) were minimal (see Table 24) suggesting that only the high controlling effort (present in “Ever” group) lead to decrease in players’s Proplay cues sensitivity (shaping of Proplay habits by conscious effort).

*Table 24: Mean comparison in Cues sensitivity between groups with different level of playing time control effort; N=377.*

	Contraplay		Proplay		N
	Mean	SD	Mean	SD	
Not at all	3.18	0.74	3.53	0.66	120
Rather not	3.09	0.59	3.60	0.60	62
Sometimes yes	3.40	0.61	3.53	0.60	153
Ever	3.46	0.68	3.20	0.63	42

In case of CCS, the main difference was between first two and last two controlling groups (see Table 24). The fact that “Not at all” group showed higher CCS than “Rather not” group suggests that CCS is a different concept than conscious regulation and helps to explain the existence of the above mentioned group of uncontrolling but relatively unproblematic and non-excessive players. Possibly, this “Not at all” group contain players that are unproblematic and non-excessive because “healthy” habitual regulation (relatively strong Contraplay cues sensitivity) and therefore with no need to consciously control their usage by exerting self-regulative effort.

### **Controlling effort and Time Perspective**

In earlier analyses had been showed that Control success depended significantly on Time perspective factors, especially Future Positive TP. To confirm this relationship, I



conducted ANOVA by Controlling effort groups to see differences in TP factors. In agreement with hypothesis, there was found significant difference in Future Positive TP ( $F(3,373)=5.383, p<0.01$ ). The strongest Future TP was found in highly controlling group (“Ever”). More the individual is Future positively oriented, more likely he will try to control his playing time (see Table 25).

*Table 25: Mean comparison in Time perspective between groups with different level of playing time control effort; N=377.*

	Future Positive TP		Negative TP		N
	Mean	SD	Mean	SD	
Not at all	3.13	0.92	2.55	0.68	120
Rather not	3.16	0.93	2.67	0.63	62
Sometimes yes	3.33	0.82	2.54	0.72	153
Ever	3.73	0.71	2.44	0.71	42

I found no significant difference in Negative TP among different controlling groups ( $F(3,373)=0.932, p=0.425$ ), suggesting that the motivation for playing time control did not depend on Negative TP.

### **Controlling effort and Control success**

On the subset of controlling players (without “Not-at-all” group; N=256), significant differences in Control success were found between different controlling groups ( $F(2,253)=7.302, p<0.001$ ). As expected, the most successful were players from the most controlling group (that tried to control their playing time “ever, or almost ever”), see Table 8.

## **2.3.4 Discussion**

The main concern of Study 2 was to develop a model of MMORPG usage predictors. Given to relatively low level of prior knowledge in the new area of online gaming, the PLS-Path Modeling was used rather than covariance-based SEM. Two comprehensive models were developed, one for Problematic usage (the presence of addictive usage

symptoms) and one for Playing time (the overall usage expressed by three measures: Hours per Week, Hours per Session, Free Time Ratio). Both models showed moderate amount of explained variability in dependent variable, almost 40% in case of Problematic usage and almost 30% in case of Playing time.

According to theoretical background presented in Part One of this thesis, variables related to either conscious regulation (Future Positive Time Perspective, Negative Time Perspective, Control success), or habitual regulation (Proplay and Contraplay Cues Sensitivity) were proposed as predictors. It had been confirmed that all proposed variables affected significantly Problematic usage in expected ways.

**Future Positive Time Perspective**, which is believed to be the important prerequisite for conscious self-regulation, affected positively the efficiency of players in controlling their playing time (**Control success**) and also **Contraplay Cues Sensitivity**. Both these variables (Control success and Contraplay cues sensitivity) had significant direct negative effect on Problematic usage. **All three variables therefore function as the protective factor against problematic MMORPG usage.**

On the other hand, **Negative Time Perspective** affected positively **Proplay Cues Sensitivity**, which was the variable with significant positive effect on Problematic usage, which was partially mediated through **Control success**. **Orientation on negative aspects of life therefore lead to stronger Proplay habits, worse control of time spent playing and eventually to occurrence of problems connected with gaming activity.**

The proposed predictors were generally less successful in explaining of variability in Playing time. Either Time Perspective factors or Control success showed no significant direct effect on Playing time. Gaming habits (Cues sensitivity) on the other hand had been confirmed as significant predictors, explaining together moderate amount of variability. Similar as in Problematic usage, **Contraplay cues sensitivity functions as the protective factor from excessive gaming and Proplay cues sensitivity leads to increase of time spent playing.**

Apart from models discussed above, I believe that Study 2 brought some other minor implications for further research on MMORPG usage. I will discuss them in following paragraphs.

## **Measuring of MMORPG Usage**

In both studies, I used the usual metric for measuring the excessiveness of playing, which is the number of hours spent playing per week (HpW). In both studies I obtained the average HpW value between 20 and 30 hours per week, which is consistent with previous research (Castronova, 2006). In Study 2, I used the other two measures of Playing time – the length of the average session (Hours per Session, HpS) and the percentage of the free time spent playing MMORPGs (Free Time Ratio, FTR). HpS seemed to be a useful measure, because it was probably more easy to report for players (compared to Hours per Week). FTR shows how much time a person spend playing MMORPGs compared to other free time activities. This could help to balance differences in time available in various players – 20 hours per week is a huge amount of time for someone with many obligations, but a relatively small amount of his free time for someone else.

All three measures correlated strongly and therefore all three might be used as measures of Playing time variable in proposed path-models. In separate analyses, all measures behave in the same way.

I encourage researchers to use all three measures to add some richness into usually plain assessing of Playing time only by Hours per Week. Especially FTR proved to be a useful indicator, because it is easy to report and it is sensitive to difference in players' time situation.

## **The role of Time Perspective in Problematic MMORPG Usage**

Several studies revealed that temporal orientation plays significant role in various compulsive or repetitive behavior (see Chapter 1.4.3). Those studies however did not attempt to clarify mechanisms that underlie those relationships.

Results obtained in Study 2 that concerned Time Perspective and MMORPG Usage showed that (1) people with negative temporal orientation are more prone to excessive and problematic gaming and (2) orientation toward positive future functions as the protective factor from problematic gaming. Both effects of TP on problematic gaming were partially mediated through the players' control of time spend gaming and their habits connected with gaming (Cues Sensitivity). Mediated effect of TP can be interpreted via previously mentioned links between TP and self-regulation. (1) Without Future Positive TP, a person

is not motivated to try to regulate his behavior in order to accomplish future goals. (2) Within the paradigm of Self-Control Strength (SCS) it has been revealed that dealing with negative feeling depletes the SCS (see Chapter 1.3.2). The Negative TP inherits the presence of negative imaginations and thoughts connected with past, present, and future and dealing with those emotions can negatively influence person's ability to consciously control his behavior.

Future Positive TP seems to affect the motivation for controlling of playing time – players in high controlling groups showed stronger Future Positive TP than those in less controlling groups. Contrary, no significant differences had been found between controlling groups in Negative TP, although the relationship between Negative TP and the success of control was significant. This suggests that Future Positive TP affect the initial stages of self-regulation (motivation for regulation) and also the final effectivity of regulation (its perceived successness), while Negative TP does not influence the motivation for regulation but affects its final effectivity (perceived successness). Unfortunately the lower perceived Control Success in respondents with Negative TP has at least two plausible explanations. (1) Depletion of SCS due to dealing with negative emotions connected with Negative TP, which would lead to the failing self-regulation, or (2) Low personal self-efficacy connected with unsatisfactory life experiences that also led to Negative TP bias and would cause the underestimation of the self-regulative effectivity. Further research is needed to explore found relationships between TP and self-regulation.

There has been also found significant direct effects of Negative TP on Playing time and Problematic usage, even when Control success was included. As I pointed out in the Discussion in Study 1, the possible explanation is that people with negative time orientation are motivated to play longer to acquire the sense of self-efficacy, which they probably lacked. In accordance with theory of self-licensing, there is also a possibility that negative feelings, related to negative TP, serve as the justification cue for unregulated hedonistic consumption. Future research is needed to confirm either presumption.

### **The role of habitual regulation in problematic MMORPG usage (Cues sensitivity)**

In agreement with previous knowledge on self-regulation within repetitive behavior, I also analyzed the role of habitual regulation in MMORPG usage. Unlike usual measurement oriented to assess the strength of habitual regulation (compared to conscious

regulation), I proposed the measurement that assess the strength and the focus (direction) of habitual regulation in sense of promoting or preventing the usage (Proplay Cues Sensitivity and Contraplay Cues Sensitivity). I believe that this measurement better reflects the reality of MMORPG usage because it presumed that other habitual or otherwise regulated activities a player is engaged in might naturally shape the MMORPG usage, without conscious regulative effort. I believe that this type of measurement would be beneficial for prevention or even treatment of excessive or problematic gaming, because it enables professional or player himself to see what situational cues encourage usage and what cues prevent it or cease it, which might be useful in planning of changes in gaming patterns.

Cues Sensitivity factors proved to be the most effective predictors of both Playing time and Problematic usage within Study 2. Cues Sensitivity factors were found to be significantly affected by Time Perspective factors. Contraplay Cues Sensitivity was affected positively by Future Positive TP and negatively by Negative TP. Proplay Cues Sensitivity was significantly positively predicted by Negative TP.

The analysis of relationships between Cues Sensitivity and variables reflecting self-regulation in gaming brought interesting results. It has been revealed that the average score for Contraplay Cues Sensitivity is not lowest in the “not-at-all” controlling group, but in the “rather-not” controlling group, suggesting that the relationship between conscious and habitual regulation of behavior is not linear and possibly there are players with relatively high Contraplay Cues Sensitivity despite the lack of conscious control effort. It supports the idea that conscious and habitual regulation are independent but not necessarily antagonistic factors of MMORPG usage.

### **The role of conscious regulation in problematic MMORPG usage (Controlling effort and Control success)**

Conscious regulation was included in the path-modelling as players' self-reported success in regulation of time spend gaming (Control success). It has been revealed that Control success is positively affected by Future positive TP and negatively by Proplay cues sensitivity. Control success was revealed as significant predictor of Problematic usage, but surprisingly it showed no direct effect on Playing time. This suggests that successful control is important for players to avoid problems connected with gaming, but it has no

significant effect on decreasing the time spend playing. Generally, players perceived their control as relatively successful, the average score was 6.8 on the 1-9 scale.

The effort to control playing time (Controlling effort) was self-reported by players on the four-options scale (“Not at all”, “Rather not”, “Sometimes yes”, “Ever, almost ever”). There was a large amount of players that did not try control their playing time at all (N=120, 32% of sample). Surprisingly, the average score of Problematic usage within this group was lower than in “Rather not” and even lower than in “Sometimes yes” group. The similar pattern was revealed also in case of Playing time measures (“Rather not” group scored in all measures higher than “Not at all” group). It suggested that there are players that play reasonably without conscious controlling effort. This is an interesting finding that should be further investigated. As suggested earlier, the plausible explanation is in the beneficial effect of Contraplay gaming habits. The group with the highest controlling effort (“Ever”) scored the lowest in Problematic usage and all Playing time measures as expected. The effort to control the playing time thus may be recommended to players as an efficient way to decrease playing time and problematic usage symptoms. The specific means that players use for this control are presented and analyzed within the Study 3 of this thesis.

### **2.3.5 Limitations**

Significant relationships were found between Time Perspective and conscious regulation. Within the theoretical part, interesting ideas concerning relationship between conscious regulation (especially self-efficacy and self-control strength) and Time perspective were proposed. Alas, they had not been tested properly, while neither self-efficacy, nor self-control strength had been measured directly. The exact nature of relationship between TP and conscious regulation thus should be further tested.

Habits related to gaming were found to be the most efficient predictor of both MMORPG usage measures (Playing time and Problematic usage). This is consistent with previous research. The innovation presented in this research was that habits do not automatically lead to overuse and problematic gaming but they might have the opposite effect. New measurement of habits, based on the sensitivity to situational cues, was used

within this research. The new scale proved good psychometrical measures, however it would be useful to test the relationship between this new and previously established measurement of habits to further confirm its construct validity.

## **2.4 Study 2 – Follow up**

In order to see how MMORPG usage will develop in different players in respect to their previous MMORPG usage, Controlling effort, Cues Sensitivity and Time Perspective, the follow-up study were conducted in June 2015, after almost three years since Study 2.

Originally, 276 respondents had been addressed via email and asked to fill the inventory that was much the same as the one they had completed three years earlier. Only three items were added to the inventory, namely “Player status”: item “*Are you still active player of MMORPGs?*”(respondents were asked to answers “yes” or “no”), “Gaming change”: item “*How much your playing changed compared to autumn 2012?*”(respondents were asked to answer on the scale from 1 to 9 from “my playing did not change at all” to “my playing changed totally”) and “Life change”: item “*How much your life changed compared to autumn 2012?*”(respondents were asked to answer on the scale from 1 to 9 from “my life did not change at all” to “my life changed totally”).

In total, 76 respondents completed the follow-up survey (69 male, 7 female), 48 were still active players of MMORPGs. The age of respondents ranged from 13 to 37, with Mean=22.4, SD=4.7.

### **2.4.1 Hypotheses**

The main concern of the follow-up was to reveal whether some variables measured in Study 2 can predict, whether the player stays active or quits, or whether he changes his usage appropriately to the changes in life. I had hypotheses related to either subjective measurement of gaming change, or objective measurement of change in MMORPG usage.

I presumed that the perceived level of change in life situation (Life change) led in respondents either to quitting the game (H1) or to changing of playing (Gaming change; H2).



The value of Gaming change variable did not specify, whether the change was directed to more or less gaming, only the extent of change as perceived by respondent was quantified. The question was how well this subjective indicator reflects the change in usage expressed by more objective measures (MMORPG-Usage-change variables).

I presumed that Gaming change would significantly correlates with HpW-change (H3), HpS-change (H4), FTR-change (H5), and Problematic usage-change (H6).

Further, **I presumed that given the average age of respondents, the changes in life would be rather those that limit the gaming as respondents would start their career and/or family life. I therefore presumed that the differences between MMORPG usage scores in 2012 and 2015 would rather decrease than increase over time.** I also believed that the decrease in MMORPG usage would depend either on Life change reported by respondents, or on Time Perspective factors as measured in 2012, because TP should be relatively stable, had been found to affect the current usage and is also presumed to affect the ability to consciously regulate the gaming.

I presume that Mean score for HpW-2015 would be significantly lower than Mean score for HpW-2012 (H7);

I presume that Mean score for HpS-2015 would be significantly lower than Mean score for HpS-2012 (H8);

I presume that Mean score for FTR-2015 would be significantly lower than Mean score for FTR-2012 (H9);

I presume that Mean score for Problematic usage-2015 would be significantly lower than Mean score for Problematic usage-2012 (H10).

Finally, I presumed that the decrease in MMORPG usage will be positively affected by Life change (H11) and Future positive TP-2012 (H12), and negatively affected by Negative TP-2012 (H13), see Figure 16.

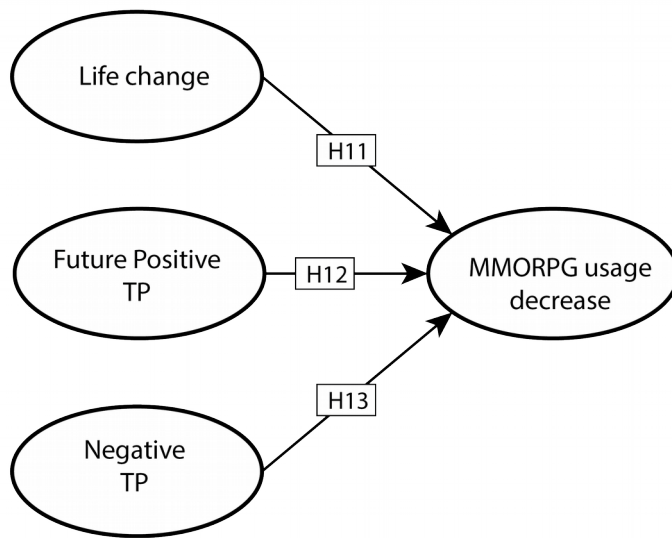


Figure 16. Schema of hypotheses H11-H13.

## 2.4.2 Measures

The measures used in Study 2-follow up had been already described in detail within Study 2. Three new variables – the Life change, Gaming change and Player status – were described earlier.

While I measured the same variables in 2015 and 2012, new variables reflecting the change in MMORPG usage can be computed as the difference between scores measured in 2015 and scores measured in 2012: HpW-change, HpS-change, FTR-change, Problematic usage-change.

## 2.4.3 Results: Descriptive statistics

### Life change

Obtained values for how much respondents' life has changed from 2012 to 2015 ranged from 1 to 9, Mean=5.80, SD=2.26; N=60.

## MMORPG usage

### Playing time measures

Obtained values for HpW-2015 ranged from 1 to 48, Mean=16.89, SD=11.22, N=48; for HpW-2012 ranged from 4 to 100, Mean=23.04, SD=17.26, N=76.

Obtained values for HpS-2015 ranged from 1 to 10, Mean=3.17, SD= 1.62, N=48; for HpS-2012 ranged from 1 to 12, Mean=6.26, SD=2.49, N=76.

Obtained values for FTR-2015 ranged from 5 to 65, Mean=34.58, SD=19.35, N=48; for FTR-2012 ranged from 5 to 85, Mean=40.79, SD=21.99, N=76.

### Problematic usage

The obtained values for Problematic usage-2015 ranged from 1.17 to 4.50, Mean=2.31, SD=0.91, N=48; for Problematic usage-2012 ranged from 1.17 to 4.67, Mean=2.56, SD=0.78, N=76.

### Stability of MMORPG usage variables

The MMORPG usage variables showed relative stability (except from HpS), expressed by moderate to high Pearson's correlation coefficients between each variable measured in 2012 and the respective variable measured in 2015:  $r_{HpW}=0.40$ ,  $p<0.01$ ;  $r_{HpS}=0.22$ ,  $p=0.14$ ;  $r_{FTR}=0.45$ ,  $p<0.01$ ,  $r_{Problematic}=0.70$ ,  $p<0.001$ ;  $r_{HpS}=0.22$ ,  $p=0.14$ .

### Gaming change, subjective and objective measures

The change in gaming between 2012 and 2015 was accessed subjectively, in the form of respondents self-report (variable Gaming change). Obtained values for Gaming change ranged from 1 to 9, Mean=5.90, SD=2.41; N=48. Respondents were also asked, whether they play more or less in 2015 than they played in 2012. Majority of respondents (34) reported to play less, 2 respondents reported to play more, and 12 respondents reported to play the same.

As an alternative measurement, for each of MMORPG usage variables (HpW, HpS, FTR, Problematic usage), the difference between 2015 and 2012 scores was computed (2015-variable minus 2012-variable). Four new variables, HpW-change, HpS-change, FTR-change and Problematic usage-change, were created. For numerical summaries of MMORPG usage-change variables see Table 26.

*Table 26: MMORPG usage-change variables' numerical summaries; N=48. Negative values represent a decrease between years 2012 and 2015.*

Variable	Mean	SD	Min	Max
HpW-change	-6.89	16.89	-80.00	28.00
HpS-change	-3.05	2.40	-8.00	3.00
FTR-change	-7.29	21.11	-50.00	30.00
Problematic usage-change	-0.26	0.67	-2.33	1.33

## Time perspective

Obtained values for Future Positive TP-2015 ranged from 2 to 5 with Mean=3.52, SD=0.78, N=48; for Future Positive TP-2012 ranged from 1 to 5, Mean=3.29, SD=1.03, N=76.

Obtained values for Negative TP-2015 ranged from 1.22 to 4.22 with Mean=2.33, SD=0.78, N=48; for Negative TP-2012 ranged from 1.22 to 4, Mean=2.50, SD=0.67, N=76.

The stability of TP was measured by correlation test between scores measured in 2012 and in 2015. The Pearson's coefficient was moderate in case of Future Positive TP ( $r=0.56$ ,  $p<0.001$ ) and high in case of Negative TP ( $r=0.74$ ,  $p<0.001$ ).

## Cues sensitivity

Obtained values for Contraplay Cues Sensitivity (CCS)-2015 ranged from 1.91 to 4.64, with Mean=3.37, SD=0.61, N=48; for CCS-2012 ranged from 1.82 to 4.36, Mean=3.29, SD=0.64, N=76.

Obtained values for Proplay Cues Sensitivity (PCS)-2015 ranged from 2.33 to 4.92, with Mean=3.48, SD=0.54, N=48; for PCS-2012 ranged from 2 to 4.75, Mean=3.45, SD=0.59.

The stability of CS factors was measured by correlation test between 2012 and 2015 scores. The Pearson's coefficient was high in case of CCS ( $r=0.73$ ,  $p<0.001$ ) and moderate in case of PCS ( $r=0.44$ ,  $p<0.01$ ).

## Controlling effort

Respondents were divided into four groups of players according to their controlling effort in 2015: Not-at-all (21), Rather-not (4), Sometimes-yes (16), Ever (7); and in 2012: Not-at-all (30 respondents), Rather-not (10 respondents), Sometimes-yes (28 respondents), Ever (8 respondents).

The stability of Controlling effort was visualized by frequency distribution table (Table 27), that shows numbers of respondents in each category. It can be said that Controlling effort is relatively stable, especially in the case of Not-at-all group, where 14 respondents from 21 were also in Not-at-all group in 2012, and Sometimes-yes, where 9 respondents from 16 were in Sometimes-yes group in 2012. Frequencies of Ever group show that the highest controlling respondents come from respondents that were rather highly controlling in 2012 (Sometimes yes and Ever group). The frequency distribution was tested by Pearson's Chi-squared test and result confirmed that the distribution is nonrandom ( $\chi^2=28.86$ ,  $df=9$ ,  $p<0.001$ ).

Table 27: Frequency distribution of Controlling effort in 2012 and 2015. Rows show how respondents in each 2015-group answered in 2012.

	2012	Not at all	Rather not	Sometimes yes	Ever
2015					
Not at all		14	4	3	0
Rather not		1	2	0	1
Sometimes yes		4	1	9	2
Ever		0	0	4	3

## 2.4.4 Results: Hypotheses testing

### Hypotheses 1-6

Within the hypothesis 1, I tested whether the Life change can predict if a player stays active or quits gaming. It was presumed that the bigger life change will be, the more probably a player will quit. Logistic regression analysis would be the standard way of testing such hypothesis. However, as a first step, the boxplots showing values of Life change in groups of still active players and quitters were examined, followed by mean comparison (Welch's t-test) that showed the Mean value of Life change in quitters is lower than in active players and that the difference is not significant. Hypothesis 1 was therefore rejected without further testing.

Within the hypothesis 2, I tested whether the Gaming change depends on Life change. Linear regression analysis was made with Life change as predictor and Gaming change as dependent variable. Life change was confirmed to be a significant predictor of Gaming change (Estimate=0.43, SE=0.15, T-value=2.90,  $p < 0.01$ ). The hypothesis 2 was therefore supported. The  $R^2$  for Gaming change was 0.136.

To test hypotheses 3-6, I performed correlation tests between MMORPG-usage-change variables and Gaming change. The significant relationship was revealed only between Gaming change and FTR-change (change in the proportion of free time which respondent spends playing MMORPGs): Pearson's correlation coefficient  $r = -0.35$ ,  $p < 0.05$ . Thus, only hypothesis 5 was supported.

## Hypotheses 7-10

In all MMORPG usage variables, a significant decrease was detected, measured by paired t-tests, see Table 28. Hypotheses 7, 8, 9, and 10 were thus supported.

*Table 28: Mean comparison paired t-test results. Difference in MMORPG usage variables in 2012 and 2015; N=77.*

Variable	Mean difference (2015-2012)	T-value	df
HpW	-6.89	-2.80**	46
HpS	-3.05	-8.60***	45
FTR	-7.29	-2.39*	47
Problematic usage	-0.26	-2.59*	46

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

## Hypothesis 11-13

Within hypothesis 11-13, the model predicting decrease in MMORPG usage was tested. Although only Negative TP was found to be a significant predictor, the amount of variability explained by proposed model was moderate ( $R^2=0.263$ ), see Figure 17 and Table 29. The analysis of outer model (measurement model, Figure 18) revealed that Problematic usage-change loaded very weakly to MMORPG-usage-decrease (0.10), leading to relatively low block communality/AVE (0.44). All other measures (HpW-change, HpS-change, FTR-change) showed relatively high loadings, from 0.58 to 0.87. Removing Problematic usage-change indicator led to increased block communality/AVE 0.59, which is however still rather low (Figure 18). Therefore, prediction of each usage-change variable was tested separately by linear regression analysis (Table 30).

Table 29: Path-model results. The effects of Life change, and TP(2012) on MMORPG usage decrease (indicated by HpW-change, HpS-change, FTR-change and Problematic usage-change); N=77.

Reference variable	Explanatory variables	Estimate	SE	T-value	Total effect	Direct effect	Indirect effect	R <sup>2</sup>
MMORPG usage decrease	Life change	-0.13	0.14	<b>-0.92</b>	-0.13	<b>-0.13</b>		<b>0.263</b>
	Future positive TP	0.21	0.15	<b>1.37</b>	0.21	<b>0.21</b>		
	Negative TP	-0.39	0.15	<b>-2.65 *</b>	-0.39	<b>-0.39 *</b>		

\* $p < 0.05$

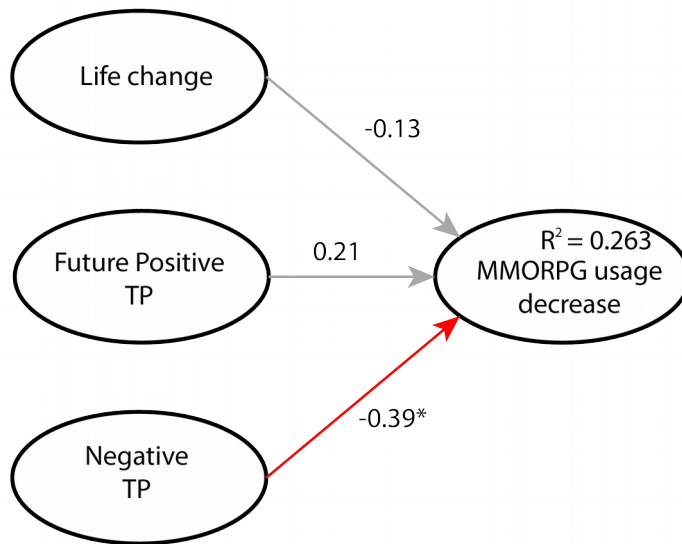


Figure 17. Structural model with path coefficients. The effects of Life change, and TP(2012) on MMORPG usage decrease (indicated by HpW-change, HpS-change, FTR-change and Problematic usage-change); N=77.



Table 30: Linear regression analyses results. The effects of Life change and TP (2012) on the MMORPG usage decrease.

Reference variable	Explanatory variables	Estimate	SE	T-value	R <sup>2</sup>
HpW-change	Life change	0.01	1.14	<b>0.01</b>	<b>0.097</b>
	Future positive TP	2.57	2.70	<b>0.96</b>	
	Negative TP	-7.90	3.59	<b>-2.20 *</b>	
HpS-change	Life change	-0.18	0.17	<b>-1.10</b>	<b>0.099</b>
	Future positive TP	-0.42	0.39	<b>-1.07</b>	
	Negative TP	-1.43	0.53	<b>-2.69 *</b>	
FTR-change	Life change	-1.98	1.32	<b>-1.49</b>	<b>0.171</b>
	Future positive TP	3.74	3.04	<b>1.23</b>	
	Negative TP	-9.52	4.19	<b>-2.27 *</b>	
Problematic usage-change	Life change	-0.02	0.05	<b>-0.51</b>	<b>0.009</b>
	Future positive TP	-0.20	0.11	<b>-1.83</b>	
	Negative TP	-0.05	0.15	<b>-0.34</b>	

\* $p < 0.05$

As shown in Table 30, Negative TP was the only significant predictor of Playing time-change variables. Proposed predictors seem most relevant for FTR-change, explaining 17% of variability. Negative TP affected all dependent variables negatively, suggesting that Negative TP contradicts decrease of MMORPG usage over time. The change in Problematic usage symptoms was not significantly predicted by any of proposed variables. Hypotheses 11 and 12 thus was not supported, hypothesis 13 was supported partially – Negative TP contradicts the “natural” decrease of time spend playing MMORPGs, but does not influence the decrease of problematic usage symptoms.

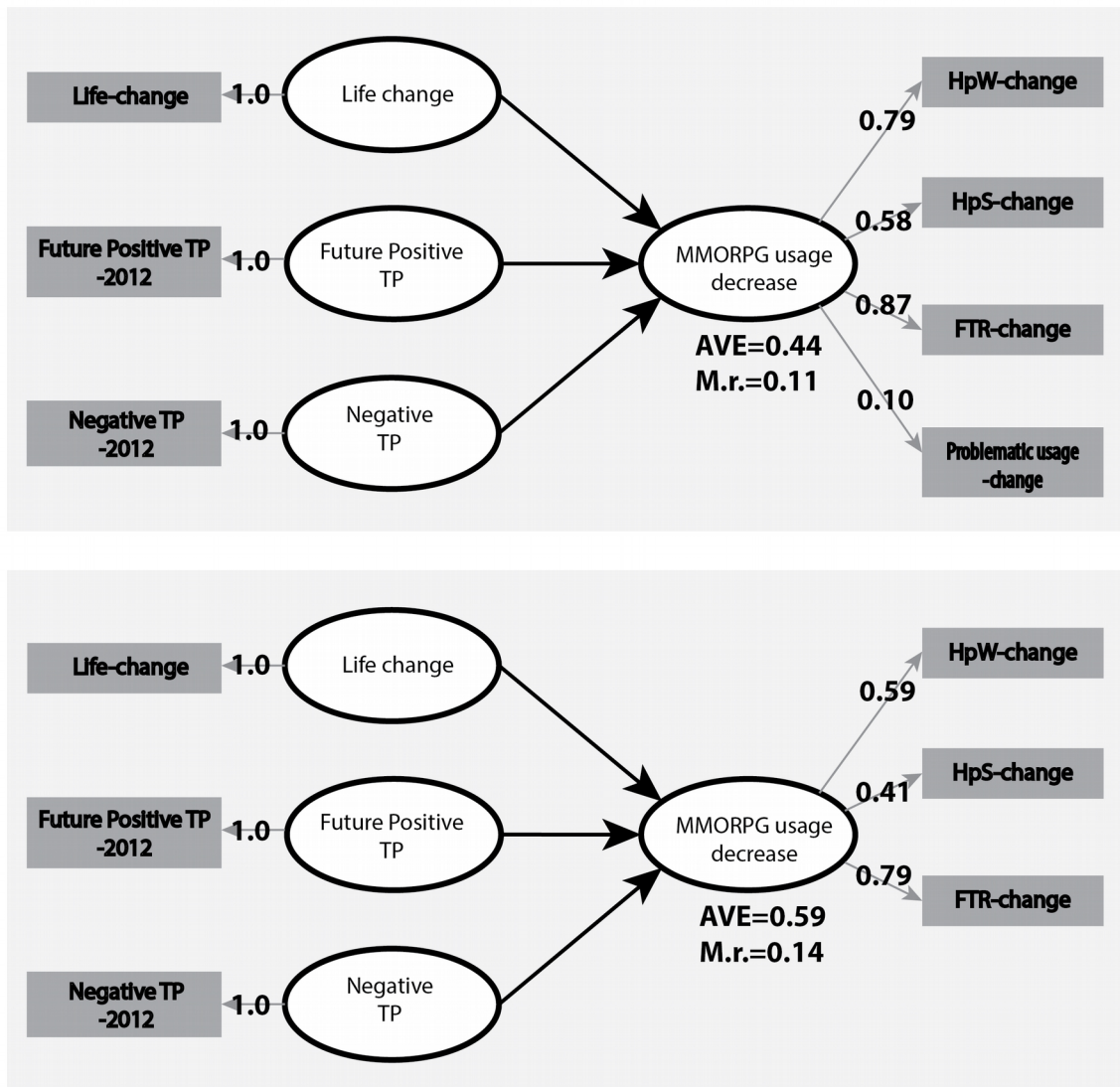


Figure 18. Structural (measurement) models. The loadings of manifest indicators of latent variables in original (top) and revised model (bottom). AVE shows block communality for “MMORPG usage decrease” variable, M.r. shows its Mean Redundancy.

## 2.4.5 Discussion and limitations

Almost all variables measured in 2012 and 2015 showed moderate or high correlation coefficients, suggesting high reliability of measurement as well as the relative stability of the measured concepts. This was expected in TP factors, while they are close to

personality traits, but it was rather surprising in gaming habits and usage variables, which were believed to be more situationally dependent.

The small amount of respondents participating in follow up of Study 2 was the main limiting factor, however some promising findings have been revealed.

All MMORPG usage variables showed in average the significant decrease over time, suggesting that in non-problematic players it is common to decrease the usage of MMORPGs. However, this was not true for players with high Negative TP, which was revealed to be significantly contradicts Playing time decrease.

Subjectively perceived changes in gaming (Gaming change) was not strongly related to “objectively” measured changes in game usage (MMORPG-usage-change variables), the only significant relationship was found between FTR-change and Gaming change. In accordance with presumptions, Gaming change was significantly predicted by Life change, suggesting that gaming patterns changes as the players' life situation changes.

## **2.3. Study 3**

### **2.3.1. Design and hypotheses**

The major concern of Study 3 was to analyze strategies that players reported to use for controlling their playing time. We had two research questions:

- (1) how players' strategies can be categorized;
- (2) what can the categories tell about players' theories of time regulation within MMORPG playing (what are the most problematic parts according to them ; how their strategies are focused).

### **2.3.2. Sample**

Respondents that provided data were a part of the sample presented within Study 2. Within the inventory presented in Study 2, I asked players whether they could report a strategy (or strategies) that they use for controlling of their playing time. In total, 162 respondents answered and therefore the analyzed dataset consisted of 162 responses.

### **2.3.3. Data analysis procedure**

Data were analyzed qualitatively. *Open, axial and selective coding* were conducted following the grounded theory methodology (Corbin and Strauss, 1990). Coding was discussed with an independent researcher.

Raw data together with their ascribed open codes are in Appendix VIII. Table that shows all forty open codes that had been used, their frequency and the category to which each code had been assigned is in Appendix IX.

### 2.3.4. Analysis and Results

Within analysis of open codes, four major categories emerged (Table 31). In the following pages, codes will be presented more thoroughly.

Table 31. Major categories of MMORPG usage regulation strategies and their subordinate codes.

Category	Open codes
Prevent longtime immersion	Monitor time, Create distraction, Seek other activities (while playing), Make regular pauses, Break immersion
Fight appeal	Be limited by other activities, Know life priorities, Set up other activities, Create obstacles
Prevent overlong sessions	Naturally stop, Willpower, Persuade to stop, Persuade not to play, Schedule, Set up stop time, Set up alarm, Limit playing time per day, Plan session, Keep routine, Be limited by other people,
Do not feel obliged to play	Play only when..., Avoid feeling to be obliged to play

#### “Prevent longtime immersion“ category

##### Monitor time

Monitoring time was the most frequently reported strategy (totally found in 57 cases).

Examples from raw data:

*(2) just watching the time constantly;*

*(6) I look at watches or I listen to TV, so I know, how much time passed.;*

*(12) Just watching time.;*

*(19) I always watch the watches;*

*(42) Only watching the watches;*

*(67) I watch the watches every few minutes.;*

*(96) Just checking the ingame clock.;*

*(137) Watching alarm clock; looking out of the window and watching stars, moon or sun;*

Sometimes, it has been reported together with other strategy, e.g.:

*(34) Just watching my clocks and remember that I cant go over 3 hours.*

*(56) I just tell myself how much time I can play, then after each run etc. I checked the clock in windows... if its too late or I know i spent a lot of time in game I dont continue playing;*

*(109) I always watch clocks... when my hour is coming. i just turn of the game. simple.*

*(117) I dont know,i just look at the clock and stop if i know i am playing too long.;*

*(125) I need study so i am watching on time and if i need to go study i off my computer;*

For monitoring passing time, players usually use watches, clocks, sometimes in-game clocks (simple digital clocks found in the game interface) or another tool, such as TV (see no.6) or movement of sun/moon (see no.137). Most players did not indicate, how often they watch the time, some however specified that they watch the time *constantly* (no.2), or *regularly* (no.35), or *every few minutes* (no.67).

Almost all time monitoring takes place during the game session. One exception had been found and labeled as “**Retrospective monitoring**“:

*(35) regular checking of clocks, checking of in-game or in-platform playtime statistics (of last 2 weeks);*

Strictly speaking, monitoring of time should not be enough for the efficient regulation (it does not include either the impulse for not-starting or the impulse for ending the game session). However, as noted in Part One of this thesis, the important feature of MMORPGs is that they are very easy to immerse in (they encourage flow experience in users), which leads to the distortion in time perception and limits the self-awareness. Self-awareness is especially important for the initial stage of self-regulation, self-monitoring.

I believe that Monitoring time is close to another four strategies that have been labeled as “**Create distraction**“, “**Seek other activities**“, “**Make regular pauses**“, and “**Break immersion**“.

## Create distraction

Creating distraction has been registered in three cases:

*(41) Watching TV / Time, fun, girlfriend, hobby, want to go out;*

*(78) I play and watch on TV.;*

*(81) Watching the watches, watching TV;*

The distractor was always TV. It might be that (as explicitly stated in no.6) the main purpose of TV watching was monitoring time. Alternatively, regular looks at watches or watching/ listening TV serve as distractors supposed to break the immersion (flow state) and thus enable player to regain self-awareness (and self-control).

## Seek other activities (while playing)

Seeking other activities was registered in two cases:

*(7) Turn on a TV, and if there something interesting I stop playing. Or i just quit if i am bored in game.;*

*(126) I just start looking for something else to do.;*

The main difference from “Create distraction“ is that the distractors here are more or less explicitly indicated as impulses for ending the game session. In one case, there is again mentioned TV as the distractor, in the second case there is not specified the alternative activity.

## Make regular pauses

Two respondents indicated that they make regular pauses within game sessions:

*(61) watching the time, taking pauses after few hours, going out with the friends at the exact time so I have to stop playing;*

*(68) When I think that it is enough I just stop :-). However I do not play for long periods, I usually take some breaks and so.*

I believe that taking pauses is also supposed to function as a distraction, the interruption of constant flow of game. It has been mentioned in Part One of this thesis that MMORPGs lacked natural stop points (playing is not divided into Chapters, gaming world exists and changes constantly). Similar as checking watches or watching TV, making regular pauses can also help players to fragmentize the session and thus add some stop points.

## Break immersion

I believe that the above presented is expressed in the following statement:

*(49) First, You need to stand up;*

The statement is figurative, but it expresses the opinion of a player that control is not possible while immersed in a game-session. It is necessary to “stand up“, to break immersion and regain self-awareness.

I suppose that the common purpose of above presented strategies is to break the flow of game (add some stop points into game) and regain self-awareness needed to efficient self-monitoring, which is the initial part of self-regulation process.

All these strategies have in common that the regulative actions take place within game-session. All these strategies are focused on encouraging the end of a session (to stop). All these strategies have in common that regulative actions are taken directly by players and are relatively independent on the external influences. I believe they form the category “Prevent longtime immersion“.

## “Fight appeal“ category

### Be limited by other activities

The frequently mentioned strategy with incidence of 20 cases has been labeled as “Be limited by other activities“. It includes statements as:

*(10) when i have to do in real life, i just go doing it, but when i dont have any homework, i just play.. :-);*



(20) *Friends, parties, music.*

(45) *i love myself :), i love rest after work, playing with my french bulldog Max, dates with my girlfriend, swimming and other stuff.. But MMORPG's is the best game ever. Game is good, but life is really challenge with real rewards,, not like in game :-);*

(47) *I use my wife and work :-D;*

(64) *Spent some time with my family...;*

(79) *My mortgage, girlfriend and a lot of work :);*

(124) *There are really causes what have to be done...there is no another way to avoid them (work, partner) i know my priorities;*

(132) *Girlfriend, book, movie, work, friends;*

(155) *Help my parents with some work;*

These statements reflects that MMORPG usage is somehow naturally limited by other activities in which one is involved. These activities belong either to area of work (or duties in general) or leisures (e.g., movies, TV, books, hobbies) or socializing (e.g., girlfriend, family, friends). Unlike the previous category “Prevent longtime immersion“, player's direct regulative action is not explicitly expressed, players rather express **that there is a natural motivation** for MMORPG usage regulation and that being motivated is enough to have gaming under control.

Similar statements is (123) *Remembering the things I have to do (For work, for my friends and family, etc.)*, which had been coded as “**Remember duty**“.

I believe that “Be limited by other activities“ reflects much the same as “**Know life priorities**“.

## Know life priorities

Knowing life priorities was detected in three cases:

(54) *Mature view over World.*

(103) *Don't have to, i know my priorities.;*

*(124) There are really causes what have to be done...there is no another way to avoid them (work, partner) i know my priorities.*

I believe that this strategy is in fact complement of “Be limited by other activities“, because it also expresses the presence of motivation for usage regulation. Statements suggest that having motivation requires maturity, knowing priorities. Essentially the same content has the statement no.118 labeled as “**Assigned game lower priority than RL**“.

Also the code “**Set up long/short term goals**“ probably concerns the motivation for control and the position of gaming within other life activities.

## Set up other activities

This strategy was indicated in 13 cases, e.g.:

*(29) Set a new things to do.;*

*(32) I just plan real life action with my friends somewhere outside. Pubs, sports, or simply hunting for girls. There are plenty things to do outside;*

*(36) work on something I enjoy and it needs to be done.;*

*(48) To have a „strategy" people should find a hobby which they like and can be their meaning of a life. Like me for examble i'm painting, I do tennis and I like traveling. Its important to separate the time, so you can do your hobbies and have time to play MMORPG. And everybody should take everything to have fun from it and enjoy the game because thats what not just MMORPG's are about but all the games.;*

*(82) i focused more on my work, studies and my girlfriend, because i told myself these things will help me in the future, and can help me with everything, time to play will be always, but other things will past away;*

*(93) I'm trying to plan a trip always when I have free time*

This strategy functions in a similar way as “Be limited by other activities“. The main difference is that in “Set up other activities“ group there is an obvious active setting up of activities that would limit MMORPG usage. Players express their effort to search for

those activities. As a result, these activities are usually “fun“, rather than “duty“, which is often mentioned as limiting activity within “Be limited by other activities“, however there are some exception (see no.82).

Conversely to “Be limited by other activities“ group, players actively seek motives that would yield similarly strong appeal as MMORPGs playing. The main problem of gaming regulation reflected within “Set up other activities“ is the “appealing call“ of MMORPG world, which is difficult not to answer. The motivation for MMORPG regulation thus is not natural (as seen in Be limited by other activities), but must be actively pursued. The same implicit opinion in all these groups is that when a person has a good reason not to play, he rather won't. To have a reason not to play (be motivated not to play) is perceived as the sufficient strategy for gaming control.

## Create obstacles

In “Create obstacles“ (detected in three cases) players again express the appealing call of MMORPG as the main concern of regulation. The solution is however different than in previous group – player is not able to restrain from playing and thus takes steps to make gaming less possible, to prevent the start of session:

*(76) When I have really important stuff to take care of, I just make the playing less possible by uninstalling or canceling subscription.;*

*(94) Sometimes I ask my friend which is GM to give me jail;*

*(128) I take my gaming notebook out of my home every week from monday to friday so I can concentrate on my work or another non gaming activities. So I play only on weekends but with no limits.*

Conversely to “Be limited by other activities“, “Knowing life priorities“ and “Set up other activities“, within “Create obstacles“ players express that being motivated is not enough for regulation. The regulative action is taken “in advance“, rather than within session (e.g., as in Prevent longtime immersion category).

I believe that Be limited by other activities, Knowing life priorities, Set up other activities and Create obstacle have similar features that might be called as Fight appeal.

## “Prevent overlong sessions“ category

### Naturally stop

The frequent statements (13 cases) referred to the natural ability to stop, while needed or wished to or when “it is a time“.

*(15) Im just able to stop playing when I want and what more, it's not so much fun to play for me anymore so I have no trouble to don't play.;*

*(18) rly dunno dude, I just can stop play;*

*(90) When I have to stop, I just stop.;*

*(98) Not at all if im think its time i just stop... :D*

*(118) I stop when I need to. I don't have to force myself, I know the best when to stop. Real life is always on the first place, no matter what's going on in the game.*

*(135) I don't need any special strategies.... I will stop when is time.*

It is obvious that these statements do not express any kind of true strategy. In fact, they suggest that no strategy is needed to stop gaming session. I believe that these statements are logical continuation of above described category “Fight appeal“. To stop is easy when a person is motivated. Moreover, to stop when needed or wished, is according to these statements viewed as the key to having gaming under control. Similar opinion is expressed within the statements labeled as “**Stop for important reason**“, e.g., *(39) If I have a homework or something else, I would stop playing.;* *(111) I do not use any strategies because i have a lot of fun and I play with a lot of my friends. **If there is something I really need to do, I will do it**, and after that I will play with them again because we have fun.;* and those that were coded as “**Stop for duty**“, e.g. *(151) I play for example one hour, I do my homework and when done my homework a play MMORPG further.;* *(157) I just watch the watches and if i need to stop because of a work i just stop if my guild doesn't need me or something.*

Those statements suggest the high stop-cues sensitivity in some respondents. It is also obvious that such respondents usually do not consider this stop-cues sensitivity be

related to conscious regulation, while many of them start their statements acknowledging that they do not use any strategy at all.

## Willpower, Persuade to stop, Persuade not to play

Opposed to “**Naturally stop**“, another group of statements labeled as “**Willpower**“ view the ability to control gaming as the power of conscious will. Similar opinion is expressed within strategies labeled as “**Persuade to stop**“ and “**Persuade not to play**“. All these statements reflect that the control of gaming requires self-controlling effort.

## Schedule, Set up stop time, Set up alarm, Limit playing time per day

Schedulling was detected in 7 cases, e.g.

*(59) As student and employee i don't have much time so i have to plan my daily schedule. That means that time on work, school, business, partner and games has to be planned every day. That helps me the most. Another good thing is setting your own short/long term goals..;*

*(66) I create a schedule into which I put times of when should I start working. My conscience doesn't allow me to proselytize much, and it helps me to start a bit sooner to know that in the end I will still have enough time if anything goes terribly wrong or will have some extra time to spend if I do especially well.*

*(146) I plan my day, duties, work; I watch time.*

These statements reflect that the point of gaming control is to balance gaming with work and other “duties“ (in this they are very similar to “Be limited by other activities“). Time of start and/or stop of each session is planned (and probably kept). Similar concept is expressed within statements labeled as “**Set up stop time**“, e.g. *(1) Give myself a time to play to, then come off when it's that time.; (17) I set up the time when I need to do something and I stop exactly in that time even if there is something very important;* and “**Set up alarm**“, e.g. *(55) Setting up an alarm clock when needed....*

Also statements labeled as “**Limit playing time per day**“, e.g. *(56) I just tell myself how much time I can play, then after each run etc. I checked the clock in windows...*

*if its too late or I know i spent a lot of time in game I dont continue playing; (25) I have demarcated playing time per day; express that the main task in gaming control is to prevent too long sessions.*

## Plan session

The same purpose – to ensure that session won't be too long – is reflected in statements labeled as “**Plan session**“. The label had been used in 10 cases, e.g.

*(23) I usually set a goal and when I achieve it, I stop the session. The goal can be big when I have time to play, or very small (to catch fish for one feast for example) if I have little time.;*

*(43) I do know how much time different tasks, instances, raids, skirmishes etc. take. I know how much time will I need to complete them so I can join or refuse particular raids or instances.;*

*(97) I say to myself I'll do two dungeons or few level bars and when its done I go do something else... Really depends on my free time situation... But when I know I have something very important thing to do I play achieve my stated goal and leave it.*

*(106) Generally speaking, I usually set some goals I intend to achieve (e.g. level up, raid completion, discovery of an unknown land etc.) and well...when I succeed in completing them, I'm filled with this "job-well-done" feeling that helps me exit the game + having other hobbies/free time activities also makes my mind occupied with something else => I have much more to live for than the world of videogames however tempting it may be! I consider videogames/MMORPGs a great way to relax/socialize/enrich my knowledge of foreign cultures/practice language skills, yet I would never let them take over the control of my life.*

Planning the session usually includes setting up some goals that player want to achieve within the session. Achievement of these goals then serves as the stop point. There are two main differences from above presented strategies with stated time to stop session: first, the stop point (cue) is more “natural“ in this strategy, more balanced with game events, which might lead to the feeling of “job well done“ (see no.106) and thus higher

probability that player would react to the stop cue; second, the limiting of playing time is less accurate, because sometimes the stated goal might take more time than expected.

Similar strategy was detected in one case and labeled “**Get bored to stop**“: (21) *Start to do boring stuff, get bored and quit for today.* There are activities in MMORPGs that may not be enjoyable (e.g., levelling professions), but they are important for avatar's development or other future achievements. These must-do activities might for some players work as the efficient stop cue.

Also the strategy labeled “**Stop when co-player stops**“ reflects adding another stop cue into gaming session: (40) *"I have a girlfriend who plays with me and we play as long as both of us want to (if one of us gets tired - than we both stop) - 1 exception - she's a student - when she learns, I usually play. After she is finished, I finish my playing too."*

## Keep routine

Ten statements were labeled as Keeping routine. There are some examples:

(3) *"Usually, my routine states that I play between work and dinner, and/or after dinner. So, with fixed times for these activities, and a more or less fixed time to sleep, the gaming time is controlled.*

*In weekends this does not work. In these situation, gaming time is controlled by chores, other appointments, etc, but never set to a specific amount."*

(4) *"I sleep, I eat, I read, I socialise, I work, I do household chores, and many of these things are done at a certain time, so I don't play WoW during that time. If I get bored playing, I stop, sometimes for days. I don't always stop to take phone calls, which I probably should.;*

(22) *I'm starting playing usually 1-2 hours before bed time so I can easily recognize when to stop. I will sometimes swap to a different online RPG or other online socialising, I'm not sure whether that counts as it doesn't control overall playing time, just WoW playing time.";*

(24) *I usually play before I go to bed. So when I come from training, then I sit to the computer and when I tired, I go sleep. Or I'm on skype with my boyfriend so when he's tired, I turn off PC too.*

*(105) "It's easy to control game time for me. From monday to thursday - i dont have time to play because of my work. I start playing on friday evening (20:00 - 24:00). On saturday its same as on friday (20:00 - 24:00) . On sunday im start playing at 08:00 and usually ending on 18:00 - with some breaks of course ;)";*

*(136) I am playing mostly on my main character when the guild has some raid but not more than two raids per week + sometimes I play on second character with my girlfriend + rarely I am leveling my other solo character.*

The most similar strategy is “Schedule“, but in “Keeping routine“ players usually expressed that the MMORPG usage cannot be planned each day, but it is somehow routinized – either in terms of time (with start and stop time marked) or the part of day (before bedtime) or otherwise (see no.136). The regulative actions from players therefore once were needed, but now they turned into habit.

## Be limited by other people

The statements labeled as “Be limited by other people“ express the strategy, when a player does not take the regulative action himself, but he uses other people that have some influence over his behavior (partner, parents, friends):

*(37) Watching time, friends stop my play at the moment;*

*(131) Get a good roommate which can tell you when to stop and when to learn;*

*(161) I have time limit from parents to play;*

As expressed in statements, this strategy is usually focused on the ending of session and thus it serves the same purpose as above presented strategies – to limit the length of game sessions.

The main focus of gaming control as expressed within “Schedule“, “Set up stop time“, “Set up alarm“, “Limit playing time per day“, “Plan session“, “Get bored to stop“, “Keep routine“ and “Be limited by other people“ statements was on preventing too long sessions – therefore I believe they can be put together into the category “Prevent overlong sessions“. The main regulative activity within this category was the creating of stop cues (be it the time, the achievement of some in-game goal or other), suggesting that the lack of stop cues is perceived by some players as the major obstacle of playing time control.



## “Do not feel obliged to play” category

### Play only when..., Avoid feeling to be obliged to play

We detected some statements that specified conditions under which a player would play and conversely should not play. Namely, “**Play only when it is fun**“ (5 cases), “**Play only when in the right mood**“ (2 cases), “**Play only when have time**“ (1 case), “**Play only when fresh**“ (1 case), “**Stop when bored**“ (3 cases), “**Stop when tired**“ (1 case), “**Don't play to improve mood**“ (1 case).

Those statements do not resemble strategies very much. However, they suggest that sometimes a gamer may play under inappropriate conditions, which leads to increasing playing time. I believe that those strategies also suggest that a player might sometimes be pressed to play. This is more or less explicitly expressed within statements labeled as “**Avoid feeling to be obliged to play**“, e.g.

*(159) I play WoW on free server Mystiq.org (actually I have paid one time 200 Kč for getting the status VIP and of course in order to support the server, but one time payment doesn't hurt) and I am not anyhow deeply bound with any guild. Combination of those two factors means that I am never feeling obliged to play and so I play only when I truly want to, without any outer influencing factors. I have to admit my main genre is not MMORPG, but single player RPG, with which I am able to spend much more time and which often replace time spent with WoW.;*

*(69) Playing alone or with friend, not being in a huge guild, having showed clock in a game;*

*(139) I just play when I can but when situation arises I can easily stop playing. That's why I am playing WoT and not WoW anymore, cause I don't have to sit straight 3h and more cause of raid.*

Within these statements some of the factors that may induce the “compulsory“ playing: guild membership, participation on raids (which is in fact the consequence of guild membership), playing in a large group (which often means to participate in raid). All these factors are external factors that may be called “in-game duties“. The above mentioned group “Play only when...“ suggested that aside in-game duties there might be

some internal factors as well – sometimes a player might play only because he can (he has the time), but he does not have any pleasure from playing (e.g., because he is tired). Also playing on a paid server may cause some inner pressure to play, probably in order to well use the expended money.

Into this group may be included a statement labeled as “**Keep in touch with co-players outside game**“: (149) *Často si určuju hodinu do kdy budu hrát a přesně tu hodinu s tolerancí 10 minut na rozloučení skončím. Také mám spoustu přátel, kteří WoW hrají a známe se v realu, tak se nutíme navzájem někam vyrážet a bavíme se spolu i mimo WoW. Pokud ve hře existují nějaké faktory, které mne tam drží, například nějaká osoba mě blízká, tak jí třeba poprosím o komunikaci přes sociální síť když musím jít pracovat nebo se učit. Potom jsem mnohem soustředěnější a neláká mne se znovu připojit. (translation: I often set up the ending hour and I keep it with 10 minutes tolerance, for good bye. I also have many friends, who play WoW, and I also meet them in real life, and we make each other to go out and have fun outside WoW. If there are some factors that keep me playing, e.g. a close person, I ask her to stay in touch via social network, when I must work or study. I am thus more focused and not tempted to play again.)*

In the statement it is explicitly said that the communication with someone close is another factor that may keep a player in session.

Another factor that may lead to playing in non-optimal conditions are habits related to gaming. While gaming is habitualized, a player does not adjust it according to the current situation.

The situation when a player adjusts his gaming according to the current feelings is also expressed within statements that have been labeled “**Get supersaturated**“: (114) *When I play too much I often lose interest in playing even for a few days. In this case the absence from gaming is not caused by external pressure, but rather by an internal feeling of supersaturation by the game.*

## Feel no need to control

Five statements expressed the absence of strategy, e.g.

(84) *I have never really tried to control my playing time.;*

*(110) Usually i don't feel need for stopping playing... i don't use any;*

These statements were thus labeled “**Feel no need to control**“ and was not further analyzed.

### **2.3.5. Discussion**

Emergent open codes can be categorized in several ways. The first categorization was already hinted in the analysis and it concerns the goal (or the main problem of control). The main purpose of all strategies was to control time spent playing, however, they differed in the specific goals that they presume to ensure the purpose. According to goal (problem), strategies can be divided into four well represented categories: Prevent longtime immersion, Fight appeal, Prevent overlong sessions, Do not feel obliged to play.

#### **Prevent longtime immersion**

According to some users, the main problem of regulation within MMORPGs playing relates to the immersion or flow phenomenon that disables a player to monitor passing time and thus in fact prevents the regulation. Respondents overcome the problem usually by constant or regular monitoring of time by watching watches and/or by distracting themselves and thus break immersion and regain self-reflection.

This is consistent with Liu and Peng's (2009) presumption that the deficient self-regulation, which is often found in MMORPG players, is caused by the fail in self-monitoring stage of self-regulation.

#### **Prevent overlong sessions**

Many reported strategies focused on the problem of prolonged sessions. The ability to end the session “in the right time“ was the main concern of these strategies. To some extent the problem of regulation is similar as within ”Prevent longtime immersion“ category, because immersion or flow also leads to prolonged sessions. The solution reflected within “Prevent overlong session“ category was however different. The key

regulative action was to define a stop cue (e.g., the exact time, the in-game goal reaching, alarm clock signal) and to end the session when the cue comes. Therefore I believe that the main problem of gaming regulation revealed within these strategies concerns the lack of natural stop cues within MMORPGs. The trouble with some “artificial“ cues (e.g., the exact time) is that they do not match with what is going on in the game. Some respondents expressed that the end of session, when the cue comes is rather conditional – e.g., they usually do not end, when they participate in raid. The frequent approach was to set a stop cue related to the game (usually reaching of some game goal).

To have gaming routinized was another way to prevent prolonged sessions. The stop cues are in this case probably habitualized and thus require less regulative effort. The obvious danger here is that the routine may be set inappropriately in the first place (leading to neglecting some other important life activity) and may be difficult to adjust, when life conditions change (e.g., the player will have less time due to the increasing amount of duties).

Finally, some respondents reported that ending of game session is very easy for them, requiring no regulative effort. I believe that also those players have habitualized stop cues, which they may not be aware of. The advantages and disadvantages of this “natural stopping“ is the same as those of routinized gaming.

## Fight appeal

Many statements concern gaming in relation with their other activities. They reflect that gaming is not regulated for its own sake but rather for the sake of other activities. Therefore, the motivation strength of these other activities is a crucial factor in gaming regulation. Respondents often emphasized the motivating power of duty, some however believed that setting up other appealing activities is needed to regulate gaming.

For some respondents the motivating force of other activities seems insufficient and thus they actively prevent themselves from gaming by making gaming more difficult (e.g., they leave their computer in the office).

All these strategies have in common that they are focused on restraining from gaming rather than on the ending a session. The regulative actions therefore are not taken within gaming session.

## Do not feel obliged to play

Several statements indicated that the main problem of MMORPG overuse is that a player feels to be obliged to play and thus he plays even when tired, not in the right mood, or bored with game. Reported reasons of this compulsive gaming were guild membership (and resulting raid participation), but also the business model of MMORPGs based on monthly subscription that guarantees unlimited playing time. This was proposed as a possible reason for excessive gaming within the theoretical part of this thesis. It is also possible that playing despite boredom or tiredness may result from habitualized playing, which is not flexible enough to ensure that gaming would proceed only under optimal conditions.

According to our findings, to achieve successful control over gaming, a player (1) needs to be motivated either by external urges such as duty, or by competing appeals to resist the urge to enter gaming world; (2) needs to prevent prolonged sessions either by breaking immersion (flow) or by installing stop cues into sessions; (3) needs to avoid feeling to be obliged to play, which may be induced by several causes such as subscription business model, guild membership, the fact that virtual world is always present and eventful (and feeling that I am missing something when I am out) or rigid gaming habits.

The collected data showed that the problem of MMORPGs usage regulation includes many aspects. Although we believed that we identified relevant aspects, we did not reveal the relationship between them – e.g. What is the relationship between fighting game appeal and preventing immersion? Must be both present for successful regulation or one of them is enough? More extensive and intensive data should be collected for the proper qualitative analysis. It must be therefore noted that our results are limited and should be seen rather as prompts for further research.

### **3. Conclusions**

An extensive theoretical analysis and three research studies were conducted in order to answer the question what makes the reasonable (non-problematic and non-excessive) player of MMORPGs.

Within the theoretical part, arguments were given for a shift from addiction oriented paradigm to paradigm focused on self-regulation, habits, the nature of activity and agency.

This focus among else led me to identify protective factors of MMORPG usage – factors that are ignored within addiction oriented etiological models. Within Study 2, I showed that these protective factors (Future Positive Time Perspective, Control success, Contraplay Cues Sensitivity) have significant explanatory power. Negative Time Perspective and Proplay cues sensitivity were conversely found to be factors promoting excessive and problematic usage. Negative TP was moreover identified as the factor behind non-decreasing the MMORPG usage measured after three years.

#### **Time Perspective in MMORPG usage**

Time Perspective has been previously found to be relevant for many kinds of human behavior, including repetitive problematic behavior such as gambling. The role of Time Perspective in MMORPG usage was analyzed within Study 1 and Study 2. Study 1 showed that Future positive TP correlates negatively with excessive MMORPG usage, while Present fatalistic TP correlates positively. Surprisingly, the effect of Present hedonistic TP on Playing time was not confirmed. Within Study 2 those relationships were further analyzed using the path-modelling methodology. It has been revealed that the effect of TP on Playing time and Problematic usage symptoms was partially mediated through the conscious control of gaming, which was significantly predicted by both measured TP factors – Future positive TP and Negative TP (composite score of Past negative, Present fatalistic, and Future negative). The distinction between positive and negative orientation was much more important for differences in usage than distinction between present and future orientation, that was previously investigated in relation to problematic and/or

hedonistic behavior. Within theoretical part some relationships between Time Perspective and self-regulation has been proposed. Although their proper empirical testing was beyond the scope of this thesis, results of Study 2 showed that the effect of Time Perspective on MMORPG usage was partially mediated through conscious self-regulation. This might be true also for other behavior patterns confirmed to relate to Time Perspective, such as school achievements, procrastination, health-related behavior and others. The significance of these findings is thus not limited to the area of MMORPG research.

Time Perspective factors showed relatively high stability measured after three years. Negative TP was found to be significant predictor of long-term development of MMORPG usage. Although all measured usage variables showed a significant decrease after three years, Negative TP affected significantly and negatively this trend, preventing the decrease.

## **Habits in MMORPG usage**

LaRose et al. (2003) argued that excessive media usage should be viewed within the paradigm of self-regulation rather than addiction, emphasizing that deficient self-regulation is implicitly in many definitions of behavioral addiction and explicitly in many diagnostic criteria (e.g., loss of control, relapse). Thus, the indicators of so-called “media addictions” may be reinterpreted as markers of deficient self-regulation and the process of addiction as the struggle to maintain effective self-regulation over problematic media behavior.

Scholars focused on self-regulation (e.g., Aarts et al., 1998) pointed out that in theories of conscious behavior is is often omitted that most of human activities have repetitive nature and thus the role of habit is crucial.

Usually habits are supposed to initiate the behavior in question, however I believe that habits might either initiate or prevent the behavior, depending on other life activities and person's attitude toward them. The relationships between the analyzed behavior and other life activities are often neglected, which is then reflected in a simplistic measurement of habits assessing only the strength of habit compared to conscious regulation. To overcome this, I proposed the measurement based on situational cues. Some of these cues relate to the analyzed activity (in this case MMORPG playing), but some of them relate to other life activities, such as work or socializing. I developed two-scales measurement of

gaming habits in order to investigate, how sensitive users are to various Proplay Cues (cues that encourage usage) and Contraplay Cues (cues that prevent usage). As expected, Cues Sensitivity factors were moderately strong predictors of MMORPG usage and they functioned in presumed directions – Proplay Cues Sensitivity led to excessive and problematic usage, while Contraplay Cues Sensitivity had the opposite effect. Although Cues Sensitivity was believed to be relatively situationally dependent, it showed surprising stability after three years, suggesting that gaming habits are either quite rigid or influenced by some stable (personality) traits.

Habitual regulation thus confirmed its high relevance in research concerning repetitive and problematic behavior. Further investigation would be needed to define relationships between Cues Sensitivity and self-regulation, however Study 2 results suggest they are rather independent concepts.

Cues-sensitivity based measurement of habits seemed to be a promising method that can be easily applied also in other areas concerning usage behavior.

## **Strategies of MMORPG usage regulation**

Within the theoretical part, I identified some features of MMORPGs that might have consequences for MMORPG usage and its regulation, namely the ability of MMORPGs to induce flow, which was supposed to work as intrinsic motivator for usage and at the same time to restrain self-regulation; and the selling model of subscription with unlimited playing time and the ever-present gaming world, which was also supposed to motivate usage. These relationships were not properly tested in this thesis, however both presented problems were identified within qualitative analysis of strategies for playing time control reported by players (Study 3). Strategies were coded and divided into four large groups according to their main focus (goal): Prevent longtime immersion, Fight appeal, Prevent overlong sessions and Do not feel obliged to play. The analysis of strategies also confirmed that gaming should be analyzed in relation to other life activities, because they often function as the natural limitation of usage. Further research is needed to investigate thoroughly these activities and their exact relations to MMORPG usage.



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# Appendices

## Appendix I: ZTPI English and Czech items

Item no.	Item in English	Item in Czech
1	I believe that getting together with one's friends to party is one of life's important pleasures.	Věřím, že scházení se s přáteli na večírcích a oslavách patří k důležitým životním radostem.
2	Familiar childhood sights, sounds, and smells often bring back a flood of wonderful memories.	Pohledy, zvuky a vůně důvěrně známé z dětství ve mně často vyvolávají spoustu nádherných vzpomínek.
3	Fate determines much in my life.	Mnohé v mém životě určuje osud.
4	I often think of what I should have done differently in my life.	Často myslím na to, co jsem měl v životě udělat jinak.
5	My decisions are mostly influenced by people and things around me.	Má rozhodnutí jsou většinou ovlivněna lidmi a věcmi v mém okolí.
6	I believe that a person's day should be planned ahead each morning.	Věřím, že člověk by si měl každé ráno předem naplánovat svůj nastávající den.
7	It gives me pleasure to think about my past.	Moc rád vzpomínám na svou minulost.
8	I do things impulsively.	Jednám impulsivně – tj. dělávám věci, které mne právě napadnou.
9	If things don't get done on time, I don't worry about it.	Nedělám si starosti, když se věci neudělají včas.
10	When I want to achieve something, I set goals and consider specific means for reaching those goals.	Když chci něčeho dosáhnout, vytyčím si své cíle a rozmyslím si jakými konkrétními prostředky k nim dospět.
11	On balance, there is much more good to recall that bad in my past.	Zvážím-li svou minulost, vybavuje se mi mnohem víc dobrého než toho špatného.
12	When listening to my favorite music, I often lose all track of time.	Při poslouhání své oblíbené hudby často úplně ztratím pojem o čase.
13	Meeting tomorrow's deadline and doing other necessary work comes before tonight's play.	Řídím se pravidlem "nejdřív práce a potom zábava".
14	Since whatever will be will be, it doesn't really matter what I do.	Vzhledem k tomu, že co se má stát se stejně stane, nesejde vlastně na tom, co udělám já.
15	I enjoy stories about how things used to be in the "good old times".	Mám rád povídání o tom, jaké to bylo za "starých dobrých časů".
16	Painful past experiences keep being replayed in my mind.	V mysli se mi opakují staré bolestné prožitky.
17	I try to live my life as fully as possible, one day at a time.	Pokouším se žít svůj život den za dnem (bez velkého přemýšlení o budoucnosti) a naplno.

18	It upsets me to be late for appointments.	Zneklidňuje mne, když jdu někam pozdě.
19	Ideally, I would live each day as if it were my last.	Nejraději bych žil každý den, jako by to byl můj den poslední.
20	Happy memories of good times spring readily to mind.	Snadno mi mysl zaplaví vzpomínky na šťastné chvíle.
21	I meet my obligations to friends and authorities on time.	Své závazky vůči přátelům a úřadům plním včas.
22	I've taken my share of abuse and rejection in the past.	V minulosti jsem si prožil svůj díl příkoří.
23	I make decisions on the spur of the moment.	Rozhoduji se bez přemýšlení, pod vlivem okamžiku.
24	I take each day as it is rather than try to plan it out.	Beru každý den tak, jak přichází, místo abych se pokoušel ho naplánovat.
25	The past has too many unpleasant memories that I prefer not to think about.	Minulost je spojena s příliš mnoha nepříjemnými vzpomínkami, na které raději nemyslím.
26	It is important to put excitement in my life.	Pokládám za důležité vnést do svého života vzrušení.
27	I've made mistakes in the past that I wish that I could undo.	Přál bych si, aby bylo možné napravit chyby, které jsem udělal v minulosti.
28	I feel that it's more important to enjoy what you are doing than to get work done on time.	Připadá mi, že je důležitější mít radost z toho, co člověk dělá, než dokončit danou práci včas.
29	I get nostalgic about my childhood.	S nostalgií vzpomínám na své dětství (jako by se mi po dětství stýskalo).
30	Before making a decision, I weight the costs against the benefits.	Než se k něčemu rozhodnu, zvažuji, zda se vynaložený čas a námaha vyplatí.
31	Taking risks keeps my life from becoming boring.	Riskování chrání můj život před nudou.
32	It is more important for me to enjoy life's journey than to focus only on the destination.	Pro mne je důležitější si cestu životem užít než soustředit se jen na cíl.
33	Things rarely work out as I expected.	Věci málo kdy dopadly tak, jak jsem čekal.
34	It's hard for me to forget unpleasant images of my youth.	Je pro mne těžké zapomenout na nepříjemnosti z mého mládí.
35	It takes joy out of the process and flow of my activities, if I have to think about goals, outcomes, and products.	Živelné potěšení z toho, co dělám, mizí, když musím myslet na cíle a důsledky své činnosti.
36	Even when I am enjoying the present, I am drawn back to comparisons with similar past experiences.	I když se zrovna těším z přítomnosti, nutí mne to srovnávat s podobnými zážitky z minulosti.
37	You can't really plan for the future because things change so much.	Život je samá změna, a tak člověk může sotva plánovat budoucnost.
38	My life path is controlled by forces I cannot influence.	Má životní cesta je řízena silami, na které nemám vliv.
39	It doesn't make sense to worry about the future, since there is nothing that I can do about it anyway.	Nemá smysl si dělat starosti s budoucností, protože ji stejně nemohu nijak ovlivnit.
40	I complete projects on time by making steady progress.	Díky soustavné práci plním úkoly včas.

41	I find myself tuning out when family members talk about the way things used to be.	Často se přistihnu, že prostě "vypnu" pozornost, když někdo z rodiny mluví o tom, jak se věci měly dříve.
42	I take risks to put excitement in my life.	Riskuji, abych dodal svému životu vzrušení.
43	I make lists of things to do.	Dělávám si seznamy toho, co mám udělat.
44	I often follow my heart more than my head.	Často spíše poslechnu hlas svého srdce než rozumu.
45	I am able to resist temptations when I know that there is work to be done.	Když vím, že je třeba udělat nějakou práci, jsem schopen odolat pokušením.
46	I find myself getting swept up in the excitement of the moment.	Nechávám se strhnout okamžitým vzrušením.
47	Life today is too complicated; I would prefer the simpler life of the past.	Dnešní život je příliš složitý, dal bych přednost jednoduššímu životu, jako byl dříve.
48	I prefer friends who are spontaneous rather than predictable.	Mám raději přátele, kteří jsou spontánní (nenuceně přirození) než ty, jejichž chování lze předvídat.
49	I like family rituals and traditions that are regularly repeated.	Mám rád rodinné tradice a pravidelně opakované rituály.
50	I think about the bad things that have happened to me in the past.	Myslívám na ošklivé věci, které se mi přihodily v minulosti.
51	I keep working at difficult uninteresting work if it will help me get ahead.	Pracuji i na obtížných, nezajímavých úkolech, když mi dopomohou k úspěchu.
52	Spending what I earn on pleasures today is better than saving for tomorrow's security.	Je lepší utratit to, co vydělám, za současné radosti než šetřit na zajištění budoucnosti.
53	Often luck pays off better than hard work.	Šťastná náhoda často přinese lepší výsledek než tvrdá práce.
54	I think about the good things that I have missed out on in my life.	Myslím na příležitosti, o které jsem v životě přišel.
55	I like my close relationships to be passionate.	Mám rád, když jsou mé důvěrné vztahy naplněny silným citem a vřelostí.
56	There will always be time to catch up on my work.	Vždycky se najde čas na to, abych v práci dohonil co jsem zameškal.

## ***Appendix II: Problematic usage scale items***

- Item no.1      I often fail to get enough sleep because of playing MMORPGs.
- Item no.2      My social life has sometimes suffered because of me playing MMORPGs.
- Item no.3      Arguments have sometimes arisen at home because of the time I spend on MMORPGs.
- Item no.4      Playing MMORPGs has sometimes interfered with my work.
- Item no.5      I have made unsuccessful attempts to reduce the time I spend playing MMORPGs.
- Item no.6      I never miss meals because of playing MMORPGs. *(Reverse coded)*
- Item no.7      When I am not playing MMORPG I often feel agitated.



## **Appendix III: ZTPI-short English and Czech items**

Item no.	Item in English	Item in Czech
1	Familiar childhood sights, sounds, and smells often bring back a flood of wonderful memories.	Pohledy, zvuky a vůně důvěrně známé z dětství ve mně často vyvolávají spoustu nádherných vzpomínek.
2	I often think of what I should have done differently in my life.	Často myslím na to, co jsem měl v životě udělat jinak.
3	It gives me pleasure to think about my past.	Moc rád vzpomínám na svou minulost.
4	I often feel that I cannot fulfill my obligations to friends and authorities.	Často mám dojem, že nemohu splnit své závazky vůči přátelům a autoritám.
5	When I want to achieve something, I set goals and consider specific means for reaching those goals.	Když chci něčeho dosáhnout, vytyčím si své cíle a rozmyslím si jakými konkrétními prostředky k nim dospět.
6	Since whatever will be will be, it doesn't really matter what I do.	Vzhledem k tomu, že co se má stát se stejně stane, nesejde vlastně na tom, co udělám já.
7	Happy memories of good times spring readily to mind.	Snadno mi mysl zaplaví vzpomínky na šťastné chvíle.
8	It is important to put excitement in my life.	Pokládám za důležité vnést do svého života vzrušení.
9	To think about my future makes me sad.	Myšlenky na mou budoucnost mě často rozesmutní.
10	I think about the good things that I have missed out on in my life.	Myslím na příležitosti, o které jsem v životě přišel.
11	It doesn't make sense to worry about the future, since there is nothing that I can do about it anyway.	Nemá smysl si dělat starosti s budoucností, protože ji stejně nemohu nijak ovlivnit.
12	I complete projects on time by making steady progress.	Díky soustavné práci plním úkoly včas.
13	I take risks to put excitement in my life.	Riskuji, abych dodal svému životu vzrušení.
14	I am able to resist temptations when I know that there is work to be done.	Když vím, že je třeba udělat nějakou práci, jsem schopen odolat pokušením.
15	Usually, I do not know how I will be able to fulfill my goals in life.	Nevím, jak budu schopen dosáhnout svých životních cílů.
16	I find myself getting swept up in the excitement of the moment.	Nechávám se strhnout okamžitým vzrušením.
17	I think about the bad things that have happened to me in the past.	Myslívám na ošklivé věci, které se mi přihodily v minulosti.
18	My life path is controlled by forces I cannot influence.	Má životní cesta je řízena silami, na které nemám vliv.

## ***Appendix IV: Cues Sensitivity Scale***

Please indicate how much you agree with each item on the 1-5 scale, when 1 is “Completely untrue for me” and 5 is “Completely true for me”.

- Item no.1 I start playing when I get home from school/work.
- Item no.2 I start playing if I know there is something interesting going on in the game (e.g., event, new patch...).
- Item no.3 I start playing when I need to relax.
- Item no.4 I start playing if I have nothing else to do.
- Item no.5 I start playing if a planned guild action starts.
- Item no.6 I start playing if I am angry or sad.
- Item no.7 Even if I would like to, I don't start playing if I have work to be done.
- Item no.8 ...I don't start playing if I need to be well slept another day.
- Item no.9 ...I don't start playing if I know I will play a lot next days (because of interesting event, new patch, friends...).
- Item no.10 ...I don't start playing if I am asked to not play by someone close (e.g., partner, friend, parents, brother or sister).
- Item no.11 ...I don't start playing if I am tired.
- Item no.12 I stop playing if the work to do appears.
- Item no.13 I stop playing if I achieve something important (e.g., level-up, equip, ...).
- Item no.14 I stop playing if I am asked to stop by a close person (e.g., partner, friend, parents, brother or sister).
- Item no.15 I stop playing if it is a time to go to bed.
- Item no.16 I stop playing if I am doing particularly poorly (little progress).
- Item no.17 I stop playing if the action (e.g., guild raid) I participated in is finished.
- Item no.18 Even if I should, I do not stop playing if I have fun.

- Item no.19 ...I do not stop playing if I am participating in a raid or a similar action.
- Item no.20 ...I do not stop playing if I am on interesting mission/quest.
- Item no.21 ...I do not stop playing if I am close to desired achievement (level, equip, mission, companion, talent...).
- Item no.22 ...I do not stop playing if I am doing particularly well (huge progress).
- Item no.23 ...I do not stop playing if I know I will not play next days for some reason.

## Appendix V: Measurement models for path-models showed in Figures 5-9

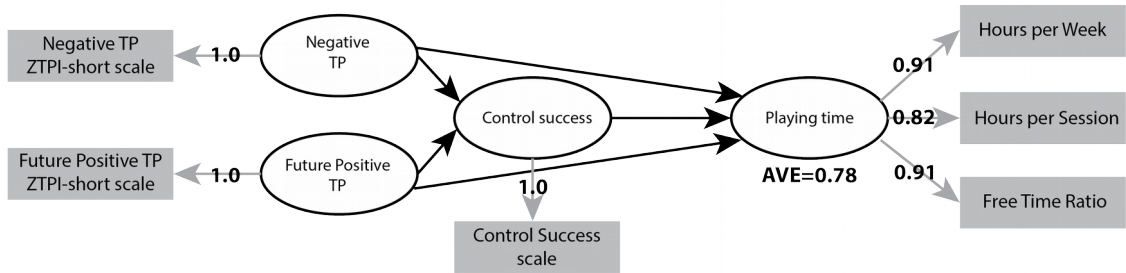


Figure V.1: Structural (measurement) model for path-model showed in Figure 5 with the loadings of manifest indicators. AVE shows block communality for "Playing time" variable.

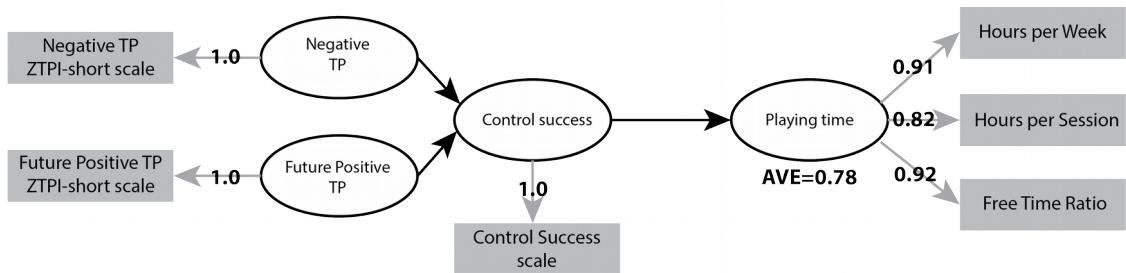


Figure V.2: Structural (measurement) model for path-model showed in Figure 6 with the loadings of manifest indicators. AVE shows block communality for "Playing time" variable.

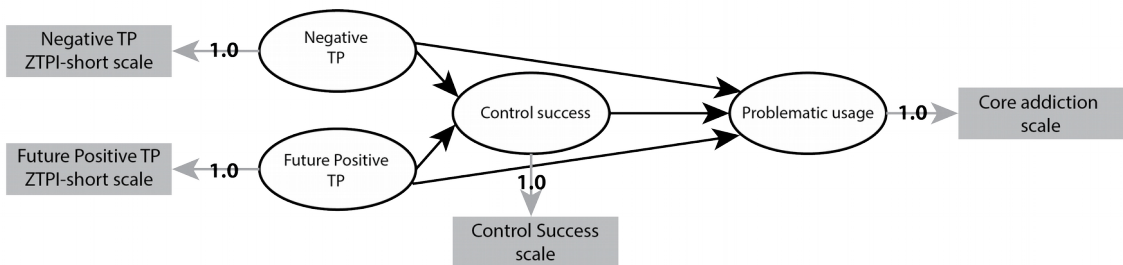


Figure V.3: Structural (measurement) model for path-model showed in Figure 7 with the loadings of manifest indicators.

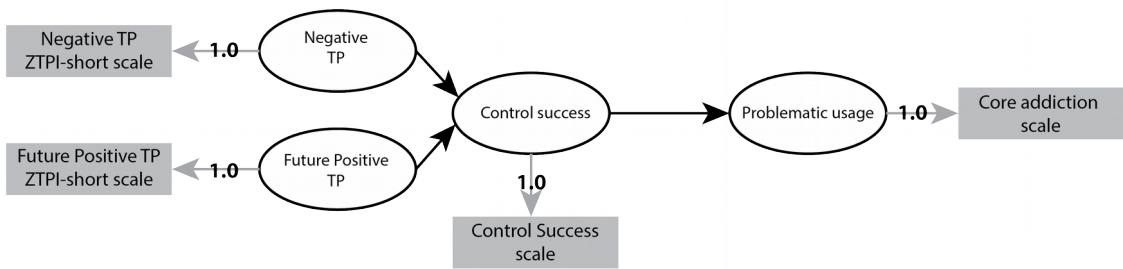


Figure V.4: Structural (measurement) model for path-model showed in Figure 6 with the loadings of manifest indicators.

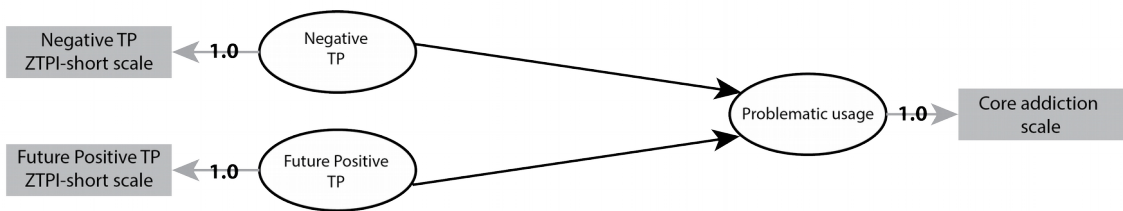
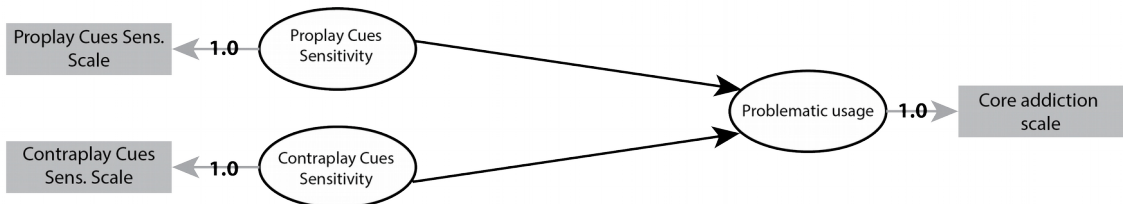
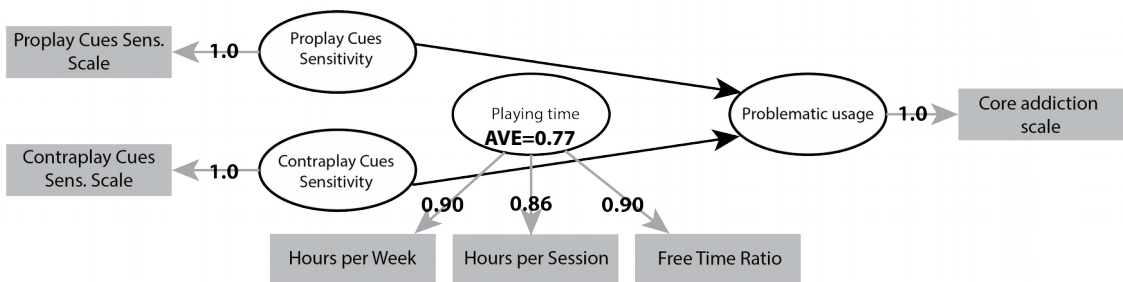


Figure V.5: Structural (measurement) model for path-model showed in Figure 9 with the loadings of manifest indicators.

## **Appendix VI: Measurement models for path-models showed in Figures 10-11**



*Figure VI.1:* Structural (measurement) model for path-model showed in Figure 10 with the loadings of manifest indicators.



*Figure VI.2:* Structural (measurement) model for path-model showed in Figure 11 with the loadings of manifest indicators. AVE shows block communality for “Playing time” variable.

## Appendix VII: Measurement models for path-models showed in Figures 12-15

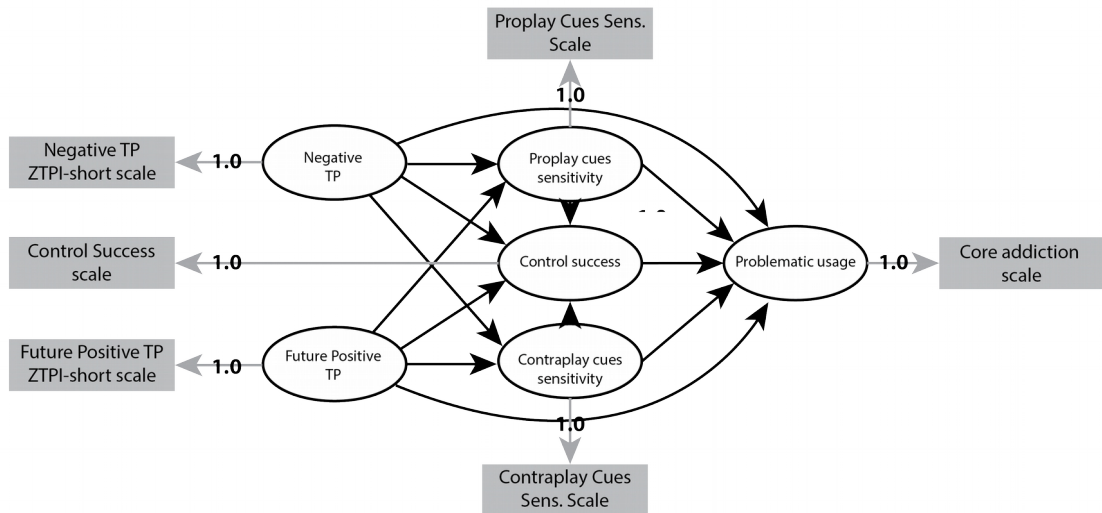


Figure VII.1: Structural (measurement) model for path-model showed in Figure 12 with the loadings of manifest indicators.

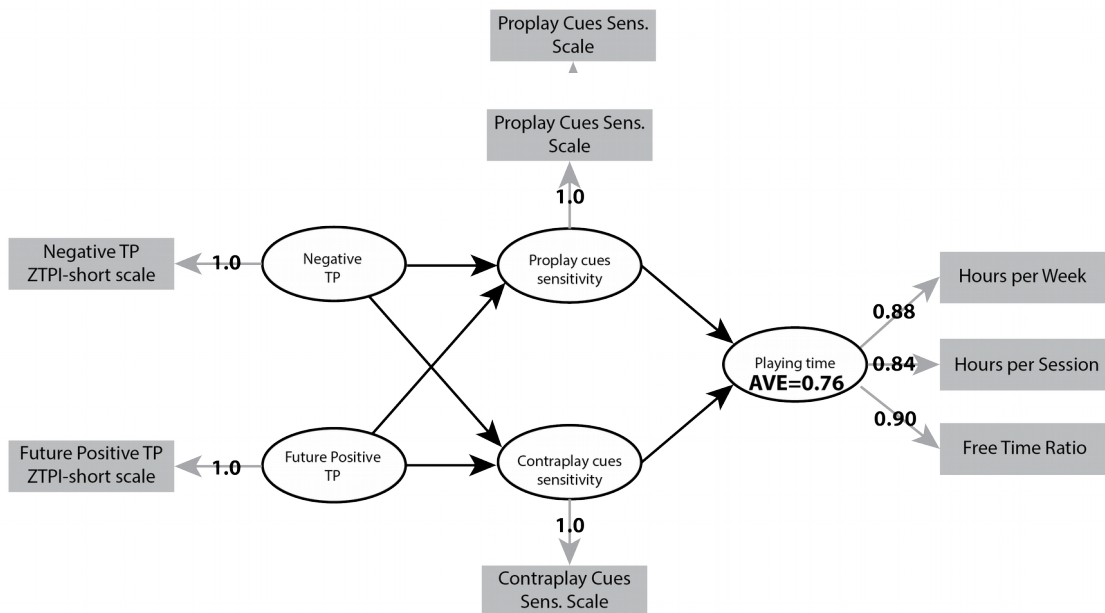


Figure VII.3: Structural (measurement) model for path-model showed in Figure 14 with the loadings of manifest indicators. AVE shows block communality for “Playing time” variable.

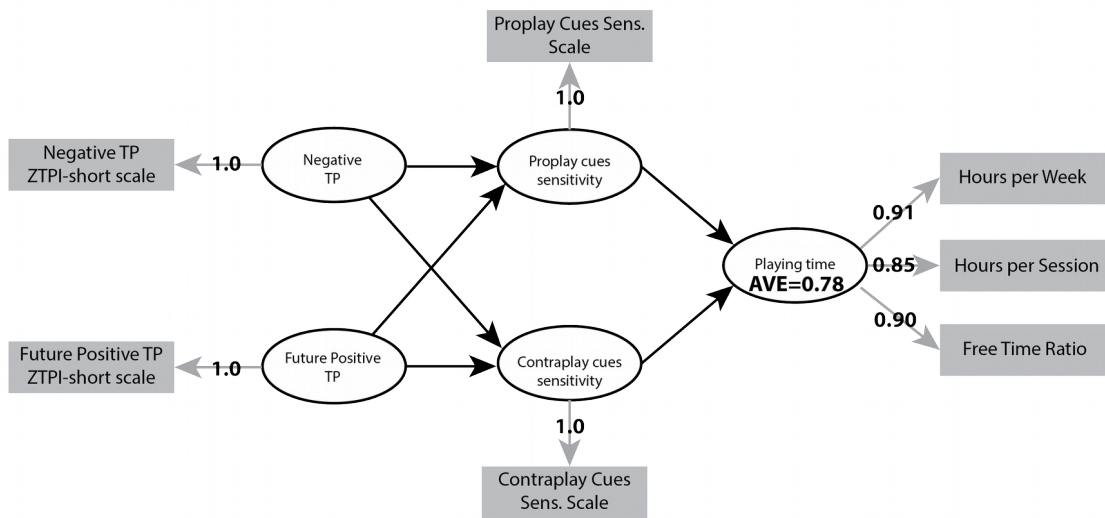


Figure VII.4: Structural (measurement) model for path-model showed in Figure 15 with the loadings of manifest indicators. AVE shows block communality for “Playing time” variable.



## ***Appendix VIII: Reported strategies and their open coding***

No.	Raw data	Open codes
1	Give myself a time to play to, then come off when it's that time.	<b>setting up stop time (hard stop)</b>
2	just watching the time constantly	<b>monitoring time</b>
3	Usually, my routine states that I play between work and dinner, and/or after dinner. So, with fixed times for these activities, and a more or less fixed time to sleep, the gaming time is controlled. In weekends this does not work. In these situation, gaming time is controlled by chores, other appointments, etc, but never set to a specific amount.	<b>keeping routine, limited by other activities</b>
4	I sleep, I eat, I read, I socialise, I work, I do household chores, and many of these things are done at a certain time, so I don't play WoW during that time. If I get bored playing, I stop, sometimes for days. I don't always stop to take phone calls, which I probably should.	<b>keeping routine, stop when bored</b>
5	I will sometimes swap to a different online RPG or other online socialising, I'm not sure whether that counts as it doesn't control overall playing time, just WoW playing time. i just like to play.. hate people in real life. (btw i have psychic diagnosis)	<b>feel no need to control</b>
6	I look at watches or I listen to TV, so I know, how much time passed.	<b>monitoring time</b>
7	Turn on a TV, and if there something interesting I stop playing. Or i just quit if i am bored in game.	<b>seeking other activities (while playing)</b>
8	watching watches	<b>monitoring time</b>
9	Schedule	<b>schedule</b>

10	when i have to do in real life, i just go doing it, but when i dont have any homework, i just play.. :-)	<b>limited by other activities (duty)</b>
11	I have strong willpower.	<b>willpower</b>
12	Just watching time.	<b>monitoring time</b>
13	I have a lot of good REAL friends.. and i like weed and alcohol :D	<b>limited by other activities (fun)</b>
14	alarm clock, friends, watchin the watches	<b>alarm clock, monitoring time, limited by other people</b>
15	Im just able to stop playing when I want and what more, it's not so much fun to play for me anymore so I have no trouble to don't play..	<b>naturally stop</b>
16	I do not using anything and that is a problem.	<b>NA</b>
17	I set up the time when I need to do something and I stop exactly in that time even if there is something very important	<b>setting up stop time (hard stop)</b>
18	rly dunno dude, I just can stop play	<b>naturally stop</b>
19	I always watch the watches	<b>monitoring time</b>
20	Friends, parties, music.	<b>limited by other activities (fun)</b>
21	Start to do boring stuff, get bored and quit for today.	<b>get bored to stop</b>
22	I'm starting playing usually 1-2 hours before bed time so I can easily recognize when to stop.	<b>keeping routine</b>
23	I usually set a goal and when I achieve it, I stop the session. The goal can be big when I have time to play, or very small (to catch fish for one feast for example) if I have little time.	<b>planning of session</b>
24	I usually play before I go to bed. So when I come from training, then I sit to the computer and when I tired, I go sleep. Or I'm on skype with my boyfriend so when he's tired, I turn off PC too.	<b>keeping routine</b>
25	I have demarcated playing time per day	<b>limit playing time per day</b>
26	Time to go to bath, time to sleep, time when my favorite serial run in TV and other :)	<b>keeping routine</b>
27	girlfriend	<b>limited by other people</b>

28	not, only by hours	<b>monitoring time</b>
29	Set a new things to do.	<b>setting up other activities (while not playing)</b>
30	watching the watches	<b>monitoring time</b>
31	online communication with my business partners anytime... still ready	<b>limited by other activities (duty)</b>
32	I just plan real life action with my friends somewhere outside. Pubs, sports, or simply hunting for girls. There are plenty things to do outside.	<b>setting up other activities (while not playing)</b>
33	If im getting bored with a game then i stop playing it.	<b>stop when bored</b>
34	Just watching my clocs and remeber that I cant go over 3 hours .	<b>monitoring time, limit playing time per day</b>
35	regular checking of clocks, checking of in-game or in-platform playtime statistics (of last 2 weeks)	<b>monitoring time, retrospective monitoring</b>
36	work on something I enjoy and it needs to be done.	<b>setting up other activities (while not playing)</b>
37	Watching time, friends stop my play at the moment	<b>monitoring time,limited by other people</b>
38	i say to myself, that i really got to do something and theres noting really interesting in game anymore for today	<b>self-persuasion to stop (inventing reasons to stop)</b>
39	If I have a homework or something else, I would stop playing.	<b>stop for duty</b>
40	I have a girlfriend who plays with me and we play as long as both of us want to (if one of us gets tired - than we both stop) - 1 exeption - shes a student - when she learns, I usually play. After she is finished, I finish my playing too.	<b>stop when co-player stops</b>
41	Watching TV / Time, fun, girlfriend, hobby,want to go out	<b>creating distraction, monitoring time, limited by other</b>

		<b>activities (fun)</b>
42	Only watching the watches	<b>monitoring time</b>
43	I do know how much time different tasks, instances, raids, skirmishes etc. take. I know how much time will I need to complete them so I can join or refuse particular raids or instances.	<b>planning of session</b>
44	I just say myself "ok, that's enough for today"	<b>self-persuasion to stop</b>
45	i love myself :), i love rest after work, playing with my frenchbulldog Max, dates with my girlfriend, swimming and other stuff.. But MMORPG's is the best game ever. Game is good , but life is really challenge with real rewards,, not like in game :-)	<b>limited by other activities (fun)</b>
46	- More "play" time spend = more time in gym - lunch and dinner time must be a real meal time, not just 10 min breake or "Pc dinner" I eat with my family, GF, or at least with good movie or book = total breake from MMO - setting hard sequence for playing - that means I dont start new dungeon, raid etc. 30 minutes before I was going to quit	<b>setting up other activities, planning of session</b>
47	I use my wife and work :-D	<b>limited by other activities (general)</b>
48	To have a „strategie" people should find a hobby which the like and can be their meaning of a life. Like me for exapmle im painting, I do tennis and I like traveling. Its important to seperate the time so you can do your hobbies and have time to play MMORPG. And everybody should take everything to have fun from it and enjoy the game because thats what not just MMORPG's are about but all the games.	<b>setting up other activities (while not playing)</b>
49	First, You need to stand up	<b>break immersion</b>
50	Keeping track of time so that I am always well slept	<b>monitoring time</b>
51	Im an adult person, i dont need anyone to tell me when to start or stop playing.	<b>feel no need to control</b>
52	When I am tired	<b>stop when tired</b>
53	my own will :))	<b>willpower</b>
54	Mature view over World.	<b>knowing priorities</b>

55	Setting up an alarm clock when needed.	<b>alarm clock</b>
56	I just tell myself how much time I can play, then after each run etc. I checked the clock in windows... if its too late or I know i spent a lot of time in game I dont continue playing	<b>limit playing time per day, monitoring time</b>
57	watching the watches	<b>monitoring time</b>
58	I just stop when I feel tired nowadays. Good idea is to play only if it is fun.  When I was playing more at one point at high-school (15hours a week) I discovered that I sometimes play MMOs even if I am not having fun at all. It seemed unhealthy so I became picky about games I play and why and it naturally dialed down.	<b>play only if it's fun</b>
59	As student and employee i don't have much time so i have to plan my daily schedule. That means that time on work, school, bussiness, partner and games has to be planned every day. That helps me the most. Another good thing is setting your own short/long term goals.	<b>schedulling, setting short/long term goals</b>
60	Watching the time, some events	<b>monitoring time, limited by other activities</b>
61	watching the time, taking pauses after few hours, going out with the friends at the exact time so I have to stop playing	<b>monitoring tim ,make regular pauses, setting up other activities</b>
62	well after a while it gets boring. And I'm usually watching the watches too.	<b>stop when bored, monitoring time</b>
63	When I absolutely need to spot playing I stop. But it has to be something really important. Because I do everything "in the last second". But sometimes I do not play at all it depends on the mood. I have no need to control my playing time because it doesnt influenced my "proffessional" life.	<b>stop for important reason, play only when in the right mood</b>
64	Spent some time with my family...	<b>limited by other activities (family)</b>
65	Just watching the watches	<b>monitoring time</b>

66	I create a schedule into which I put times of when should I start working. My conscience doesn't allow me to proselytize much, and it helps me to start a bit sooner to know that in the end I will still have enough time if anything goes terribly wrong or will have some extra time to spend if I do especially well.	<b>setting schedule</b>
67	I watch the watches every few minutes.	<b>monitoring time</b>
68	When I think that it is enough I just stop :-). However I do not play for long periods, I usually take some breaks and so.	<b>naturally stop, make regular pauses</b>
69	Playing alone or with friend, not being in a huge guild, having showed clock in a game	<b>avoid large group playing, avoid huge guild membership</b>
70	i am playing until i enjoy it.	<b>play only if it's fun</b>
71	just watching the watches	<b>monitoring time</b>
72	I usually plan some goals, that I should accomplish in the game that day. When I am finished with it (like level up, or some important task) then I quit the game.	<b>planning of session (goals)</b>
73	i don't control playing time. i play as long as i want.	<b>feel no need to control</b>
74	I have strong will, so when I want to stop I stop.	<b>willpower</b>
75	watching watches...	<b>monitoring time</b>
76	When I have really important stuff to take care of, I just make the playing less possible by uninstalling or canceling subscription.	<b>creating obstacles</b>
77	watching the watches	<b>monitoring time</b>
78	I play and watch on TV.	<b>creating distraction, monitoring time</b>
79	My mortgage, girlfriend and a lot of work :)	<b>limited by other activities</b>
80	Just watching the time, it's simple as that	<b>monitoring time</b>
81	Watching the watches, watching TV	<b>creating distraction, monitoring time</b>
82	i focused more on my work, studies and my girlfriend, because i told myself these things will help me in the future, and can help me with everything, time to play will be always, but other things will pass away	<b>setting up other activities (while not playing)</b>

83	I usually do not control how long I play, but if i want to I just watch the watches.	<b>monitoring time</b>
84	I have never really tried to control my playing time.	<b>feel no need to control</b>
85	watch watches.	<b>monitoring time</b>
86	ne nebaví me tolik jako MMORPG	<b>NA</b>
87	I just watching the watches :)	<b>monitoring time</b>
88	Alarm clock	<b>alarm clock</b>
89	I have something in plan and I have to do it.(ex. girl, gig...)	<b>setting up other activities</b>
90	When I have to stop, I just stop.	<b>naturally stop</b>
91	watching the time..	<b>monitoring time</b>
92	Just watching wathes	<b>monitoring time</b>
93	I'm trying to plan a trip always when I have free time	<b>setting up other activities (while not playing)</b>
94	Sometimes i ask my friend which is GM to give me jail	<b>creating obstacles</b>
95	I control my free time.	<b>free time schedulling</b>
96	Just checking the ingame clock.	<b>monitoring time</b>
97	I say to myself I'll do two dungeons or few level bars and when its done I go do something else... Really depends on my free time situation... But when I know I have something very important thing to do I play achieve my stated goal and leave it	<b>planning of session (goals)</b>
98	Not at all if im think its time i just stop... :D	<b>naturally stop</b>
99	watching the watches	<b>monitoring time</b>
100	I make myself think that the work that needs to be done and the problems that need to be solved are much more important than they actually are.	<b>setting up other activities, don't play to improve mood, play only when it is fun</b>
	I try to plan and ask myself questions, like: "If I don't solve the problem now in the time of my playing session, then when?"	
	I try to compare my need of playing a game with the need of another person that demands something from me. (But	

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mostly don't agree with the other person on this matter.)

I try to realize that I play for fun (or sometimes to beat a challenge), not to get from a bad mood into good mood, because that in most cases doesn't work out and only wastes time.

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101	I start to study something I'm interested in (programming, making graphics, etc.)	<b>setting up other activities (while not playing)</b>
102	I "ration" content into parts that i need to complete during one playing session. I rarely deviate from this plan.	<b>planning of session</b>
103	Don't have to, i know my priorities.	<b>knowing priorities</b>
104	Playing is for fun, like reading books. I play when I have time and I want to play. I'm not anti-social person who has no hobbies	<b>playing only when have time and right mood</b>
105	It's easy to control game time for me. From monday to thursday - i dont have time to play because of my work. I start playing on friday evening ( 20:00 - 24:00 ) . On saturday its same as on friday ( 20:00 - 24:00 ) . On sunday im start playing at 08:00 and usually ending on 18:00 - with some breaks of course ;)	<b>keeping routine</b>
	Sorry for my english ;)	
106	Generally speaking, I usually set some goals I intend to achieve (e.g. level up, raid completion, discovery of an unknown land etc.) and well...when I succeed in completing them, I'm filled with this "job-well-done" feeling that helps me exit the game + having other hobbies/free time activities also makes my mind occupied with something else => I have much more to live for than the world of videogames however tempting it may be! I consider videogames/MMORPGs a great way to	<b>planning of session, occupying thoughts by other activities</b>

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relax/socialize/enrich my knowledge of foreign cultures/practice language skills, yet I would never let them take over the control of my life.

107	Put watches on table in front of me.	<b>monitoring time</b>
108	set ingame clock up	<b>monitoring time</b>
109	I always watch clocks... when my hour is coming. i just turn of the game. simple.	<b>monitoring time, limit playing time per day</b>
110	Usually i don't feel need for stopping playing... i don't use any.	<b>feel no need to control</b>
111	I do not use any strategies because i have a lot of fun and I play with a lot of my friends. If there is something i really need to do I will do it and after that I will play with them again because we have fun.	<b>stop for important reason</b>
112	When my friend are asking to play another game with them.	<b>limited by other activities (fun)</b>
113	in game clocks or checking mobile phone for time	<b>monitoring time</b>
114	When I play too much I often lose interest in playing even for a few days.	<b>get supersaturated</b>
115	part of my day routine, don't even need a watch...	<b>keeping routine</b>
116	Watches plus fresh mind. Time spent in game is not equal to fun or experience (i don't mean in-game XP) :)	<b>monitoring time, play only when fresh</b>
117	I dont know,i just look at the clock and stop if i know i am playing too long.	<b>monitoring time, naturally stop</b>
118	I stop when I need to. I don't have to force myself, I know the best when to stop. Real life is always on the first place, no matter what's going on in the game.	<b>naturally stop, game has lower priority than RL</b>
119	Watching clock, motivating myself for non playing (having more time for playing later :)	<b>monitoring time, self-persuasion not to play</b>
120	in game "to do" list	<b>planning of session</b>
121	alarm, watching the clock, memos on phone	<b>monitoring time, alarm clock</b>
122	My own will to stop	<b>willpower</b>
123	Remembering the things I have to do (For work, for my	<b>remembering duties</b>

	friends and family, etc.)	
124	There are really causes what have to be done...there is no another way to avoid them (work, partner) i know my priorities	<b>limited by other activities (duty), knowing priorities</b>
125	I need study so i am watching on time and if i need to go study i off my computer	<b>limited by other activities (duty), monitoring time</b>
126	I just start looking for something else to do.	<b>seeking other activities (while playing)</b>
127	I start playing only after my children are in beds, and stop when im tired or is max 01:00	<b>keeping routine</b>
128	I take my gaming notebook out of my home every week from monday to friday so I can concentrate on my work or another non gaming activities. So I play only on weekends but with no limits.	<b>creating obstacles, keeping routine</b>
129	watching the watches	<b>monitoring time</b>
130	watching time	<b>monitoring time</b>
131	Get a good roommate which can tell you when to stop and when to learn	<b>limited by other people</b>
132	Girlfriend,book,movie,work,friends	<b>limited by other activities</b>
133	Either I'm watching the watches or I set some goal like "I will finish these 2 quests/defeat this boss/complete this achievement"	<b>monitoring time, planning of session</b>
134	Before starting to play, i usually decide, how much time i will spend on the game and I try to keep that. I only extend that time, if there isnt anything i have to do and i am in the middle of something really interesting. I keep watching the watches during playing.	<b>planning of session,mild stop, monitoring time</b>
135	I don't need any special strategies.... I will stop when is time.	<b>naturally stop</b>
136	I am playing mostly on my main character when the guild has some raid but not more than two raids per week + sometimes I play on second character with my girlfriend + rarely I am leveling my other solo character.	<b>Keeping routine</b>

137	Watching alarm clock; looking out of the window and watching stars, moon or sun	<b>monitoring time</b>
138	I'm simply "watching the watches" if I have smoe work to do, or my mother stops me when she wants to use the computer, too. If there is no work waiting for me, I don't control my playing time at all.	<b>monitoring time, limited by other activities (duty)</b>
139	I just play when I can but when situation arises I can easily stop playing. Thats why I am playing WoT and not WoW anymore, cause I dont have to sit straight 3h and more cause of raid.	<b>avoid raids</b>
140	Find another talent/hobby . Boardgames are perfect and also more social than MMO. In hand painting miniatures and scenario for epic board games makes me happy. Runewars, Earth Reborn, Battlestar Galactica, Descent Journey to the Dark, Eclipse and many others games are better than MMORPG, because some of them are playable in bup :D Its important to know that when game will be gone or it will not entertainment you any more, all "values" you reached or created in that game have no value in real life. So if you are bored or not happy when you are playing its really WASTE of your life time, even worst than sleeping or staring to the wall ( where you can think or imagine about anything) . And also girlfriend or family is important in hand of all.	<b>setting up other activities (fun, family), play only when it is fun</b>
141	I reminds myself I have work to do	<b>remembering duties</b>
142	have other stuff to do	<b>limited by other activities</b>
143	Watching to watches	<b>monitoring time</b>
144	I just stop playing when it is time to do so.	<b>naturally stop</b>
145	watching the clock, I can organize my free time yet with the obligations and having fun by myself	<b>monitoring time, schedulling</b>
146	i plan my day, duties, work i watch time	<b>schedulling, monitoring time</b>

	I'm about 12 hours per day in the work.	
	I have girlfriend I want to be with, but we don't live together yet.	
147	I have other free time activities I want to keep on my active list.	<b>limited by other activities (duty, partner, hobbies, social life)</b>
	And main reason, I think I'm not still that child, who played about 12 hours of games per day. Thing will change, when you are older and when you have some social life.	
148	I just know when stop	<b>naturally stop</b>
149	Často si určuju hodinu do kdy budu hrát a přesně tu hodinu s tolerancí 10 minut na rozloučení skončím. Také mám spoustu přátel, kteří WoW hrají a známe se v realu, tak se nutíme navzájem někam vyrážet a bavíme se spolu i mimo WoW. Pokud ve hře existují nějaké faktory, které mne tam drží, například nějaká osoba mě blízká, tak jí třeba poprosím o komunikaci přes sociální síť když musím jít pracovat nebo se učit. Potom jsem mnohem soustředěnější a neláká mne se znovu připojit.	<b>setting up the ending time and keep it (hard stop), setting up other activities (fun), keep in touch with co-players outside game</b>
150	watching the watches	<b>monitoring time</b>
151	I play for example one hour,I do my homework and when done my homework a play MMORPG further.	<b>stop for duty</b>
152	wathing the ingame/normal watches	<b>monitoring time</b>
153	watching the watch	<b>monitoring time</b>
154	Point is, I rarely have something else to do besides of playing, so I dont feel I need to control myself in this regard.	<b>feel no need to control</b>
155	Help my parents with some work	<b>limited by other activities (duty)</b>
156	Just watching the watches. I set a time schedule on things I need to do (out of game) and then follow it.	<b>monitoring time, schedulling</b>
157	I just watch the watches and if i need to stop becouse of a work i just stop if my guild doesn't need me or something.	<b>monitoring time, stop for duty (mild stop)</b>
158	Me	<b>willpower</b>

159	<p>I play WoW on free server Mystiq.org (actually I have paid one time 200 Kč for getting the status VIP and of course in order to support the server, but one time payment doesn't hurt) and I am not anyhow deeply bound with any guild. Combination of those two factors means that I am never feeling obliged to play and so I play only when I truly want to, without any outer influencing factors. I have to admit my main genre is not MMORPG, but single player RPG, with which I am able to spent much more time and which often replace time spent with WoW.</p>	<p><b>avoid feeling to be obligated to play (avoid paid servers, avoid guild membership), play only when it is fun</b></p>
160	<p>watching the watches, looking out of a window.</p>	<p><b>monitoring time</b></p>
161	<p>i have time limit from parents to play</p>	<p><b>limited by other people</b></p>
162	<p>i am not adict i can stop whenever i want</p>	<p><b>naturally stop</b></p>

## **Appendix IX. Open codes, their Frequency and Classification**

Open codes	Frequency	Category
Monitor time	57	Prevent longtime immersion
Limited by other activities (general, duty, fun, family)	21	Fight appeal
Set up other activities (while not playing)	13	Fight appeal
Naturally stop	11	Prevent overlong sessions
Plan session	10	Prevent overlong sessions
Keep routine	10	Prevent overlong sessions
Schedule	7	Prevent overlong sessions
Feel no need to control	5	
Willpower	5	Prevent overlong sessions
Limited by other people	5	Prevent overlong sessions
Play only when it's fun	5	Do not feel obliged to play
Set alarm	4	Prevent overlong sessions
Limit playing time per day	4	Prevent overlong sessions
Avoid feeling to be obligated to play (avoid paid servers, avoid guild membership, avoid playing in group, avoid raids)	4	Do not feel obliged to play
Stop when bored	3	Do not feel obliged to play
Create obstacles	3	Fight appeal
Set up stop time (hard stop)	3	Prevent overlong sessions
Stop for duty	3	Prevent overlong sessions
Create distraction	3	Prevent longtime immersion
Seek other activities (while playing)	2	Prevent longtime immersion
Persuade to stop	2	Prevent overlong sessions

Know life priorities	3	Fight appeal
Make regular pauses	2	Prevent longtime immersion
Stop for important reason	2	Prevent overlong sessions
Play only when in the right mood	2	Do not feel obliged to play
Remember duties	2	Fight appeal
Get bored to stop	1	Prevent overlong sessions
Retrospective monitoring	1	Prevent longtime immersion
Stop when co-player stops	1	Prevent overlong sessions
Break immersion	1	Prevent longtime immersion
Stop when tired	1	Do not feel obliged to play
Set short/long term goals	1	Fight appeal
Don't play to improve mood	1	Do not feel obliged to play
Play only when have time	1	Do not feel obliged to play
Occupy thoughts by other activities	1	Fight appeal
Get supersaturated	1	Do not feel obliged to play
Play only when fresh	1	Do not feel obliged to play
Assign game lower priority than RL	1	Fight appeal
Persuade not to play	1	Fight appeal
Keep in touch with co-players outside game	1	Do not feel obliged to play

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