Theses of the doctoral dissertation

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The motivational background of online game types

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1 Introduction

Since their appearance in the 1990s, online video games have become widely popular and accessible. Nowadays, they are one of the most widespread recreational activities irrespective of culture, age, and gender. Parallel with this, the dangers of problematic use have begun to arise.

1.1 Definition, background and typology of online games

Video games can be played on many different platforms, such as personal computers (PCs), video game consoles, handheld game consoles, tablets or smartphones — all of which can be played via access to the Internet. In this chapter, these games are referred simply as online games, although several different names (e.g., online video games, Internet video games) can be found in the literature. Another important point to be made is that online gaming differs from online gambling, because there is no money staked during these games in an attempt to win further money.

Video games can be divided into two main groups — online and offline video games — a distinction that can significantly influence player behavior. Offline games are usually (but not always) played alone, have a well defined start and finish point and the goals of the game can usually be achieved by the players themselves without external help from any other player. However, online games are typically played simultaneously by players who can communicate with one another in real time, cooperating or competing at will. Because of their inherent structural characteristics, these games do not usually have a predetermined end point. Furthermore, new tasks and quests are frequently added by the game developers and/or game operators. Subsequently, there is no real loss, and tasks can be repeated several times. Some goals can be achieved alone or together with other players, while others can be completed only by players working together in highly cooperative groups. Competing with fellow players is also possible and leads to immediate social comparison (M. D. Griffiths, 2010; Kim & Kim, 2010; Williams et al., 2006). Consequently, online games are distinguished from offline games mostly by their social nature (J. P. Charlton & I. D. Danforth, 2007; Choi & Kim, 2004; Ducheneaut & Moore, 2005; Kim & Kim, 2010; Williams et al., 2006). Although in some games the aforementioned characteristics blend, most of them can clearly be specified as offline or online games. Due to these characteristics, the popularity of these game types can differ greatly. de Prato, Feijóo, Nepelski, Bogdanowicz, and Simon (2010) indicate that 70% of gamers prefer online as opposed to offline games.

Online gamers spend more time gaming than those who play offline games, mostly because of the social nature of these games. They find online games more pleasant and satisfying than offline games and sometimes prefer playing games to real-life activities (Brian D Ng & Peter Wiemer-Hastings, 2005). These motives may also account for the findings showing that online games trigger the appearance of problematic use more often than offline games do (Mark D Griffiths, Davies, & Chappell, 2004; M. D. Griffiths & A. Meredith, 2009; Rehbein, Psych, Kleimann, Mediasci, & Mößle, 2010). These findings confirm the importance of this research area.

1.2 The online game types and their research background

According to some ideas the online games are not differing essentially from the offline games, therefore they use these types together in their researches (Gentile, 2009; Lemmens, Valkenburg, &

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1 This chapter is the extracted version of the Nagygyörgy, K., Pápay, O., Urbán, R., Farkas, J., Kun, B., Griffiths, M. D., & Demetrovics, Z. (2013). Problémás onlinejáték-használat. PSYCHIATRIA HUNGARICA, 122-144. paper.
Peter, 2011; Porter, Starcevic, Berle, & Fenech, 2010). However others consider the Internet use as a crucial part of the game play therefore they refer to online games as one type of Internet use (Han, Hwang, & Renshaw, 2010; Antonius J Van Rooij, Tim M Schoenmakers, Ad A Vermulst, Regina JJM Van Den Eijnden, & Dike Van De Mheen, 2011). Another group of researchers are only focusing on MMORPGs, as those are considered the most complex games (J. P. Charlton & I. D. Danforth, 2007; Cole & Griffiths, 2007; Mark D Griffiths et al., 2004; Hussain & Griffiths, 2009; Nick Yee, 2006a). Although there is no research which analysis the online games in one unit by taking into account of both aspects. Besides the common features online games share, they could be divided into three big and an other category (Ghuman & Griffiths, 2012).

1) **Massively multiplayer online role-playing games (MMORPGs) and their variations:** As in traditional role playing games, players control an avatar that becomes their virtual game self. Players choose a profession that determines their role and abilities. Through fulfilling different tasks or missions in the game, the avatars develop (a vertical development called “leveling up”) and acquire precious objects that lead to the differentiation in status between avatars. (Cole & Griffiths, 2007).

2) **Massively multiplayer online first person shooters (MMOFPSs) and their variations:** These are skill-demanding action games, in which the player controls a single avatar from a first-person perspective. They mostly rely on reaction time and attention abilities and offer several ways of cooperation and competition—on an individual or group level—between the players.

3) **Massively multiplayer online real-time strategy (MMORTSs) games and their variations:** As opposed to the first two game types, here the players typically oversee large troops and/or territories in a virtual world, engage in battles, or conclude alliances with other players. Through successful management, players establish status in the game world and gain esteem from other players.

4) **Other online games:** This category includes all the other online games, such as sport and racing games, music/rhythm games, multiplayer online social games, or turn-based strategy games. Because this is a mixed category, all the specific and idiosyncratic characteristics cannot be outlined. Compared to the other three game types, these games attract fewer players, but at the same time the proportion of female players is much higher

### 1.3 The role of structural characteristics in problematic online gaming

The online games are the result of a conscious planning and designing process (Dickey, 2007). The game designers goal is to keep a continuous interest in the heterogenic group of gamers therefore they try to satisfy all the possible needs that games could address (D. Kuss & M. Griffiths, 2012; D. J. Kuss & M. D. Griffiths, 2012). In the gambling literature, a number of authors have examined the role of structural characteristics of different gambling activities (i.e., slot machines) because they appear to be important in the acquisition, development, and maintenance of problem gambling behavior (M. Griffiths, 1999b; M. Griffiths, 1999; Parke & Griffiths, 2007). A similar exploration regarding the structural characteristics of online games has also been suggested (D. King & Delfabbro, 2009; D. L. King, Delfabbro, & Griffiths, 2011).
D. L. King et al. (2011) created a theoretical model based on the gambling literature contained five main groups:

1. **Social features**: socializing aspects, cooperation, competitive behavior
2. **Manipulation and control features**: interact and control game properties
3. **Narrative and identity feature**: role-playing, identity immersion
4. **Reward and punishment feature**: different types of reinforcement
5. **Presentation feature**: aesthetic qualities and voice effect

In a follow-up empirical study, reward and punishment features, such as earning points, finding rare game items, and fast-loading times, were rated by players among the most enjoyable and important aspects of video game playing. Problem video game players reported significantly higher enjoyment of features such as managing in-game resources, earning points, getting 100% in the game, and mastering the game than nonproblem players, which are features that typically take up more playing time than other features. (D. L. King et al., 2011).

### 1.4 The motivation background of online games

The motivation research of online games could be divided into two separate groups, one is dealing with gamer profiles and the other is using already existing motivational models and applying it to the field of gaming.

Those methods which are measuring the gamer profiles could identify the gamers actual behavior and in-game preferences (Bartle, 1996; Z. Demetrovics et al., 2011; K Nagygyörgy, Mihalik, & Demetrovics, 2012; Sherry, Lucas, Greenberg, & Lachlan, 2006; N. Yee, 2006; Yee, Ducheneaut, & Nelson, 2012). This aspect provides more objective results about the gamers’ behavior compared to a self-report method. It provides a construct possible to replicate for comparing results among different motivational studies. Z. Demetrovics et al. (2011) developed an empirically based motivational measure called the Motives for Online Gaming Questionnaire (MOGQ) comprising of seven factors (i.e., social, escapism, coping, fantasy, skill development, recreation, and competition) and making the comparison between online gamers possible. Altogether the goal of the motivational models this category contains are to make it understandable why people wanted to play with an exact game. The results will show the behavior pattern and the preferred in-game motivations (Bartle, 1996; Z. Demetrovics et al., 2011; Sherry et al., 2006; N. Yee, 2006; Yee et al., 2012).

The effect of continuous gaming has been examined by more basic motivational models. Lafrenière, Verner-Filion, and Vallerand (2012) developed and validated a questionnaire that could measure the underlying motivation of online gamers. They used the Def-Determination Theory to design the Gaming Motivational Scale (GAMS). It measures six different 6 factors (Intrinsic motivation, Integrated regulation, Identified regulation, Introjected regulation, External regulation and Amotivation) with 3 items on each. They confirmed the internal consistency and reliability of the factors. Rigby and Ryan (2007) developed the Player Experience of Need Satisfaction questionnaire (PENS). It helps in exploring what basic needs (autonomy, competence, and relatedness) may be satisfied in the individual by playing video games and what type of psychological outcomes players get from playing video games. It also focuses on motivational factors involved in players’ willingness to continue playing. Published data was not found about the validity and internal consistency of the questionnaire. It measures the motivation with 10 items (autonomy: 3 items, competence:4 items, relatedness:3 items). The definitions of the factors are the same as in the original theory only they applied it to the field of gaming.
1.5 Problematic online game use

By the huge growth of the online game industry it has become a central issue to come up with an agreement in the definition of problematic game play (Blaszczynski, 2008; Byun et al., 2009; M. Griffiths & A. Meredith, 2009; Wood, 2008). Despite the increasing amount of empirical research into problematic online gaming, the phenomenon sadly lacks a consensual definition. One group of researchers consider video games as the starting point for examining the characteristics of this specific pathology (J. P. Charlton & I. D. W. Danforth, 2007; Charlton & Danforth, 2010; M. Griffiths, 2005; M. Griffiths, 2010a, 2010b; M. Griffiths & A. Meredith, 2009; Peters & Malesky, 2008), whereas others consider the Internet as the main platform that unites different addictive Internet activities, including online games (A. J. Van Rooij, T. M. Schoenmakers, A. A. Vermulst, R. J. Van den Eijnden, & D. Van de Mheen, 2011; Young, 2009). Recent studies make an effort to integrate both approaches (Zsolt Demetrovics et al., 2012; Kim & Kim, 2010).

Examining the empirical evidence, one can argue that online game addiction can be defined as one type of behavioral addiction (Zsolt Demetrovics & Griffiths, 2012; Zsolt Demetrovics & Kun, 2007, 2010; Zsolt Demetrovics et al., 2012; Grant, Potenza, Weinstein, & Gorelick, 2010; Mark D. Griffiths & Hunt, 1995; D. Kuss & M. Griffiths, 2012). Besides different existing names, in the thesis I used the problematic online gaming as a term as it describes the quintessence of the phenomenon and also avoiding the notion of dependency or disorder.

In 2013 this phenomenon was included in Section III (an appendix of disorders for further study) of the DSM-5 under the name of Internet Gaming Disorder (APA, 2013) which means the problem was acknowledged as an important topic to direct attention on and resources into this research field.

2 Aims of the dissertation

When we analyzed the literature of online games it becomes evident that M/MORPG is the most studied game type (Cole & Griffiths, 2007; M. D. Griffiths, M. N. O. Davies, & D. Chappell, 2003; Grusser, Thalemann, Albrecht, & Thalemann, 2005; Grusser, Thalemann, & Griffiths, 2007; Hussain & Griffiths, 2009; B. D. Ng & P. Wiemer-Hastings, 2005; Nick Yee, 2006a) and just a few studies focus on the M/MOFPS and M/MORTS games (Ghuman & Griffiths, 2012; Jansz & Tanis, 2007). M. Griffiths (1993a) pointed out many years ago when developing taxonomy of different gaming genres, different types of games are likely to be played by different people for different reasons.

1.1. Therefore, the aim of the first study was to compare gamers playing different types of online games among a large sample of gamers in relation to their socio-demographic characteristics and gaming characteristics.

1.2. There was an additional aim to explore a typology of online gamers. The major aim in terms of contribution to the psychological literature is to provide of a benchmark for the demographic profile of players from three previously unresearched genres of games.

The result of the first study was the principle of the second study as it validated the existence of the different gamer types (Katalin Nagygyörgy et al., 2013) as we also know that different game types are differ in their structural characteristics (King et al., 2010c; Westwood & Griffiths, 2010; Nagygyörgy et al., 2013), the question might emerge that weather their motivational characteristics also differ from each other.

2.1. Therefore the goal of the second study is to identify the motivation pattern of the four main online game types with a questionnaire that could be applied to all of the online game genres.
The information was highlighted in the introduction chapter that motivation plays an important role in the development and sustainment of problematic online gaming (Z. Demetrovics et al., 2011; D. J. Kuss & M. D. Griffiths, 2012). As motivations differ by game types (Ghuman & Griffiths 2012) it is also possible that those have a different effect on problematic gaming either.

2.2. The second goal is to explore the connection between the game types and problematic game use and compare the results of the different types.

Some researches already showed connections between the motivation and problematic online gaming (Hellström, Nilsson, Leppert, & Åslund, 2012; Kwon, Chung, & Lee, 2011; Li, Liau, & Khoo, 2011; K Nagygyörgy et al., 2012; N. Yee, 2006; Zanetta Dauriat et al., 2011). Although it’s important to highlight that the listed researches mainly focused on special online game types (usually MMORPGs) therefore they are not suitable for online game type comparison.

2.3. The third goal of this study is to explore the connection between the game types and problematic online game use.

Different studies analyzing the underlying motivation of autonomy, competency and relatedness in online games suggest that there is a connection between the satisfaction of game play and the desire to play again (Przybylski, Weinstein, Ryan, & Rigby, 2009; Ryan, Rigby, & Przybylski, 2006). However Lafrenière et al. (2012) raises a point that it would be interesting to compare the different motivation measurements with each other. It could help us to get a broader picture about the phenomenon.

3.1. Therefore the third study’s goal is to compare motivational questionnaires with different theoretical background.

Beside the motivation, we know that general psychiatric distress also shows connection with problematic online gaming (Brunborg, Mentzoni, & Froyland, 2014; D. A. Gentile et al., 2011; Hyun et al., 2015; Peng & Liu, 2010; Stepanikova, Nie, & He, 2010; Stetina, Kothgassner, Lehenbauer, & Kryspin-Exner, 2011). Such findings have been reported in the alcohol and gambling literature (Cooper, Fron, Russell, & Mudar, 1995; Cox & Klinger, 1988; Kaysen et al., 2007; Kuntsche et al., 2015; Stewart, Zvolensky, & Eifert, 2001; Urbán, Kökönyei, & Demetrovics, 2008). Those studies have also indentified that there is a direct connection between the symptoms and the problematic use and there is an indirect route mediated by the motives. Király et al. (2015) pointed out that it’s the same, also in the case of problematic online gaming.

3.2. The second goal of the study is to examine the mediating role of the different online gaming motives between psychiatric symptoms and problematic use of online games.

Research has consistently shown that there are gender differences in online game play (Tekofsky, Miller, Spronck & Slavin, 2016), therefore we need to consider it as an important aspect of the problematic game play also (Chou & Tsai, 2007; Douglas A Gentile et al., 2011; Mark D Griffiths, 1997; Mark D. Griffiths & Hunt, 1995; Jeong & Kim, 2011; Lemmens et al., 2011; Williams, Yee, & Caplan, 2008).

3.3. The third aim was to test the moderator effect of gender and game type preference in the mediation models.
As the second study showed special connections between the game types, problematic game use and motivation and the third study proved the mediating effect of different motives between the psychiatric distress and the problematic online gaming,

4.1. the question emerged to test how the mediation models change by game types.

These researches also conducted values to examine an area which was highlighted in DSM-5 that it is evident that online games have different game types although it’s unclear yet how behaviors and consequences depends on it.

3 Empirical studies

3.1 Typology and socio-demographic characteristics of massively/multiplayer online game players

Methods

The summarized goal of the study to identify the online gamers socio-demographic characteristics and gaming characteristics. Therefore an online research looked like a right environment to collect data. All Hungarian websites that offer the playing of online games were identified (N=18). All 18 sites were contacted and asked for information about the number of visitors and whether they were willing to participate in the study. Based on the information received from all 18 sites, the number of (ever) registered users was estimated to be approximately 30,000. All sites agreed to help in the recruitment of online gamers either on their website or in the form of a newsletter sent directly to the player base. In the call for participation, online gamers were asked to visit the research team’s survey website. A total of 4,390 completed questionnaires were received. However, 16 questionnaires were excluded from the analysis, as they did not contain any data on the characteristics of gaming activity. Because of this, the analysis was carried out on the remaining sample of 4,374 online gamers (8.8% female, mean age 20).

Major socio-demographic characteristics of online gamers were collected (i.e., gender age, educational qualifications, marital status, schooling, occupation, etc.). Gaming habits of online gamers were explored in detail. All participants were asked to shortlist online games that they usually played and to classify these games into four possible categories. Online gamers were also asked to indicate how many hours they played weekly, how much money they spent on gaming, and whether they played at an amateur or professional level.

Main results and discussion

The main aim of the present study was to provide robust benchmark data using a large sample on different types of MMOG players and their description in terms of socio-demographic and gaming characteristics. The latent profile analysis (N=4374) (Collins & Lanza, 2010), differentiated 8 gamer types. The results showed that a majority of MMOG players (79%) had a clear gaming preference: M/MORPG (N=2013), M/MOFPS (N=1193), M/MORTS (N=164), other online games (N=85).

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2 This chapter is the extracted version of Nagygyörgy, K., Urbán, R., Farkas, J., Griffiths, M. D., Zilahy, D., Kökönyei, G., ... & Harmath, E. (2013). Typology and socio-demographic characteristics of massively multiplayer online game players. International journal of human-computer interaction, 29(3), 192-200.
Beside these groups we identified four mixed game types: M/MORPG+M/MORTS gamers (N=171), M/MORPG+M/MOFPS gamers (N=458), M/MORTS+M/MOFPS gamers (N=124), not differentiated game characteristics: (N=166). In relation to this, one could speculate perhaps that specific games fulfill specific psychological needs and that gaming preferences are being formed in accordance with these needs.

1. Figure Latent profile analysis of MMOG players according to the time spent with different types of games.

The survey also provided an opportunity to describe and compare different types of online gamers. MMOFPS players were almost exclusively male, younger, had less education, and came from a lower socioeconomic status. Nearly two thirds did not spend any money on gaming. However, a high proportion of online gamers in this group (4.1%) spent more than $50 USD. These gamers were predominantly students, and although they spent relatively less time with online games, especially when compared to MMORPG players, they might be considered a vulnerable group if not for other reasons than their age. MMORPG gamers spent more time playing than other gamers. This suggests that role-playing games may be more reinforcing than other types of game due to the structural characteristics of the game, and/or role-playing gamers may have particular demographic and/or inherent psychological characteristics that facilitate and enhance prolonged play (D. King et al., 2011). Approximately 13% of them played more than 6 hrs per day and an additional one fourth (25.1%) spent 4 to 6 hrs playing these games. Therefore, this phenomenon undoubtedly requires further attention, particularly in relation to possible problematic and/or addictive play (Demetrovics és Griffiths, 2012; Demetrovics és mtsai, 2012; Kuss és Griffiths, 2012a, 2012b). A significant number of gamers, especially those playing MMORPGs and MMOFPSs, are constant members of amateur, semiprofessional, or professional groups.
3.2 The interrelation of online game types with motivation and problematic gaming

Methods

Study 2 used the same dataset as Study 1 except we eliminated the 79% of gamers who have a „clean” game preference. Altogether the sample comprised 3455 gamers: M/MOFPS (N=1193), M/MORPG (N=2013), M/MORTS (N=164) and other online game (N=85) user.

Major socio-demographic characteristics (gender, age.) and gaming habits (game type, time) were collected. Problematic online gaming was assessed using the Problematic Online Gaming Questionnaire (POGQ) (Demetrovics et al., 2012), while online gaming motives were assessed using the Motives for Online Gaming Questionnaire (MOGQ) (Demetrovics et al., 2011). Both questionnaires were validated in a Hungarian sample.

Main results and discussion

The clear online game types LPA classes were examined from the perspective of motivation and problematic online game play, and compared their factor results. For these comparisons, Wald χ² test of mean equality for latent class predictors in mixture modeling was used.

Altogether, M/MORPG players have high escapism, coping, fantasy and recreation points from which escapism, coping, fantasy have a high internal correlation (Z. Demetrovics et al., 2011). The M/MOFPS players have high coping, skill development and competition. The M/MORTS players have high skill development and recreation points and the other category shows lower escapism, coping and competition factors. Therefore, we can say that the perceived gaming motives differ by game types.

2. Figure Results of the motivation factors by game types

The second goal was to examine the relationship between the game types and problematic online game play. Preoccupation was the highest at M/MORPG players which means they are more prone to obsessive thinking and daydreaming on the online game. The M/MOFPS and M/MORPG players showed higher numbers in overuse than the others. Immersion was the highest at M/MORPG users. It means that they are dealing excessively with online games and losing track of time more than the
others. These two categories, M/MOFPS and M/MORPG, showed the highest game times compared to the others. The social isolation was the lowest at the other online game category which shows that these gamers neglect the least the social event in their real life. The M/MOFPS and M/MORPG players showed the highest numbers in interpersonal conflicts compared to other online game users. The main reason could be that M/MOFPS players are younger than all the other game type users therefore they may play under parental control which could easily produce problems (Ghuman & Griffiths, 2012; Katalin Naggyörgy et al., 2013). The M/MOFPS and M/MORPG players showed the highest numbers again, in withdrawal. This means they feel more restlessness and tension when they cannot play. Interestingly the M/MORTS category is not showed any remarkable differences.

3. Figure Result of problematic game use by game types

In the third study setting we compared the four main game types and checked how they behave in the same regression model. In this model we tested which motivation predicts problematic game play.

Based on the regression analysis connection was identified between the M/MOFPS players problematic usage ($R^2=0.315$, $F(1193)=108.579$, $p<.001$) and escapism ($b=1.33$, $t(1193)=9.604$, $p<.001$), competition ($b=0.76$, $t(1193)=7.521$, $p<.01$), fantasy ($b=0.48$, $t(1193)=3.283$, $p<.001$) and social ($b=0.35$, $t(1193)=2.789$, $p<.01$) factors. The result shows that the problematic use of M/MORPG players ($R^2=0.325$, $F(2013)=249.843$, $p<.001$) connected to escapism ($b=7.20$, $t(2013)=14.296$, $p<.001$), coping ($b=1.39$, $t(2013)=1.972$, $p<.05$) and competition ($b=-0.14$, $t(2013)=11.935$, $p<.001$) factors. M/MORTS players problematic use ($R^2=0.392$, $F(164)=39.285$, $p<.001$) was predicted by coping ($b=1.02$, $t(164)=4.999$, $p<.001$) and competition ($b=0.82$, $t(164)=3.417$, $p<.01$). Problematic players who only choose to play other games ($R^2=0.432$, $F(85)=49.628$, $p<.001$) were related to fantasy ($b=1.87$, $t(85)=7.045$, $p<.001$). The factors were listed in descending order. The results support our hypothesis that types are differing in the interrelation of motivation and problematic use. We can see, that games with the largest player base, M/MOFPS and M/MORPG, were related to escapism and competition which were identified in previous studies. The M/MORTS players were more prone to cope with stress via online games, what might be the result of the fact that this is the oldest gamer group compared to the others. Results also pointed out the game type related problematic elements are not equal with the favored motives. Therefore problematic and non-problematic gamers play the same game for different reasons.
In the following section we will check how motivations related to problematic use could be connected to underlying psychological mechanisms.

The escapism could be defined, as an escape from real life, or when someone avoids real life problems. These problems usually come together with the feeling of tension and anxiety (N. Yee, 2006). This process could work as lower level of coping mechanism, which focuses on avoiding problems. It emerged between M/MOFPS and M/MORPG users.

Although coping has a smaller effect size, it still worth to mention as it refers to a mechanism which could reduce the tension, stress and aggression in-game (Z. Demetrovics et al., 2011). Although it looks like that this mechanism is still not as effective to pick up a fight with the full psychological background mechanism. The question then arises; do games have an effect on coping, and if yes, how could it change over time. This element emerged by M/MORTS and M/MORPG users.

Based on the structure of the motivational questionnaire escapism, coping and fantasy highly correlate with each other, the appearance of fantasy in the regression model is not a big surprise. Online games offer a lot of new possibilities, that couldn’t be tried in real life (Sherry et al., 2006). Therefore gamers can try out new identities with functions and action they can’t afford or do in real life. Based on the research data, all the gamers show empathy towards their avatars (Frostling-Henningsson, 2009), although problematic and nonproblematic gamers differ in how they interpret their characters. Those who see a game role in their avatar which is a tool to visualize them in games are less prone to behave addictively than those who think about their characters as an extension of themselves. The latter usually wanted to be like their characters. This behavior is more typical in younger age (Smahe, Blinka, & Ledabyl, 2008). M/MOFPS and other online game types showed this item in the regression model.

Competition is a comprehensive part of online games and it has a direct and indirect form. The rules and norms of games support and reward this behavior, like obtaining valuable items, or learning special skills. These valuable in-game symbols will be immediately visible for all the other gamers which provides status, rank or title to the gamer (N. Yee, 2006). If the game is the only place where they can experience these reinforcements, it’s possible that they choose gaming over real life activities (Przybylski et al., 2009). This item emerged in the model of M/MOFPS, M/MORTS and M/MORPG players.

The reason of the social factor’s appearance in the model of M/MOFPS players could be connected to the main game mechanism as all players need to work and cooperate in a group to achieve the essential goals of the game. In this game players can only play with real people. This factor is highly connected to the competition factor of the game. The question could emerge from the problematic online game use perspective, if tension and anxiety are linked to social anxiety or not and how the social motivation of online games reacted on that. If a player can satisfy his social needs in a game it could emphasize the value of the game.
### 3.3 Comparing the motivational models of online game use

#### Methods

Data collection took place online in cooperation with a Hungarian gamer magazine, GameStar. Calls for participation were spread through Facebook with the cooperation of a gamer magazine between August and September 2014. The sample comprises 5294 online gamers.

Data related to major socio-demographics were collected including age, gender, marital status, and education. Additionally, data were collected regarding weekly game time and preferred game type. The intensity of psychiatric distress was assessed using the Global Severity Index (GSI), an index calculated from the BSI (Derogatis, 1975; Urbán et al., 2014). Problematic online gaming was analysed using the Problematic Online Gaming Questionnaire (POGQ) (Demetrovics et al., 2012). Online gaming motives were assessed using three different questionnaires. The Motives for Online Gaming Questionnaire (MOGQ) measured the motivation based on the game characteristics (Z. Demetrovics et al., 2011), while the other two measured the underlying motivation of the gamers. GAMS (Gaming Motivation Scale) (Lafrenière et al., 2012) was developed based on the Self-Determination Theory and PENS (Player Experience of Need Satisfaction) measures the basic needs of players (Rigby & Ryan, 2007).

#### Main results and discussion

It was hypothesized that general psychiatric distress has both a direct and indirect effect on problematic online gaming via motivations. In two cases (MOGQ, GAMS) the models were proved (PENS doesn’t show connection with problematic gaming behavior). Therefore psychiatric symptoms had a significant direct and indirect effect on problematic online gaming. The model via MOGQ explained 39% of the total variance of problematic online gaming. This result is close to the result of a previous study by Király et al. (2015) which received 44%. Results are in line with previous results, escapism ($\beta=.09; p<.001$) appeared with the highest effect size (Hellström et al., 2012; Király et al., 2015; Kwon et al., 2011; Li et al., 2011; K Nagygyörgy et al., 2012; N. Yee, 2006; Zanetta Dauriat et al., 2011), than fantasy ($\beta=.03; p<.001$) (Hsu, Wen, & Wu, 2009). Beside this competition ($\beta =.01; p<.001$) (Király et al., 2015; K Nagygyörgy et al., 2012; N. Yee, 2006; Zanetta Dauriat et al., 2011) and coping ($\beta=.02; p<.001$) emerged in the model. Hagström and Kaldo (2014) pointed out that escapism shows the strongest effect with psychological distress.

Only four of the previously emerged motivations got place in the mediation model. In the background of the missing social factor we could see that it’s only a special characteristic of M/MOFPS games related to competition. It might be also possible that it shows relation to problematic behavior although it hasn’t got a role in the mediation model. Our next study could partly answer this question, as we can see the main mediator is escapism. It also important to highlight that coping emerged again, which assumes a better coping mechanism, although it still has a small effect size. It would be nice to see how it changes over time. The competition also emerged as in the other research (Király és mtsi. 2015). The genders show differences as competition isn’t mediated in the model of female gamers (only escapism, coping and fantasy emerged). This result is in line with previous findings, as male players preferred more the competitive aspect of games than females (Sanger, Wilson, Davies, & Whittaker, 1997; Wood, Griffiths, Chappell, & Davies, 2004; Nick Yee, 2006a, 2006b). It may also mean that fantasy plays a bigger role in the problematic behavior of females.
The model via GAMS showed significant direct ($\beta=.25; p<.001$) and indirect ($\beta=.26; p<.001$) paths between psychiatric distress and problematic online gaming. In relation to the indirect effect between psychiatric symptoms and problematic gaming the mediator paths are the following: introjected regulation ($\beta=.15; p<.001$); amotivation ($\beta=.06; p<.001$); integrated regulation ($\beta=.03; p<.001$); intrinsic ($\beta=.01; p<.001$); external regulations ($\beta=.01; p<.001$). The strongest effect was showed by the introjected regulation. This could be the desire for reward or the fear of punishment therefore these players feel higher anxiety which is connected to lower coping mechanism (Deci & Ryan, 2011).
This could be like the escapism mechanism which emerged in the first model. The second strong element was amotivation which is similar to helplessness and refers to the relative absence of intrinsic and extrinsic motivation. It usually emerges due to the feeling of failure and cause a reaction barrier (Deci & Ryan, 2011). The integrated regulation also emerged which goes with more effective coping mechanism (Deci & Ryan, 2011). Female players only showed strong connection with introjected regulation.

Considering the results of the mediation models, a way of a distress reduction can be observed. Khantzian (1985) self medication theory states that substance use is a coping strategy through which users try to compensate their psychiatric distress and attain emotional stability. This compensatory behavior then contributes to the development and maintenance of the problem behavior. The goal is a mood modification (M. Griffiths, 2005).

5. Figure The mediation model of GSI-GAMS-POGQ (N=5279) and standardized path coefficients. Results of multigroup analysis and path coefficients across both genders and the explained variance of the endogenous variables
3.4 The interrelation of motivation models and problematic game play with gamer types

Methods

Study 4 used the same dataset as Study 3. Data collection took place online in cooperation with a Hungarian gamer magazine, GameStar. Calls for participation were spread through Facebook with the cooperation of a gamer magazine between August and September 2014. The sample comprises 5294 online gamers.

Data related to major socio-demographics were collected including age, gender, marital status, and education. Additionally, data were collected regarding weekly game time and preferred game type. The intensity of psychiatric distress was assessed using the Global Severity Index (GSI), an index calculated from the BSI (Derogatis, 1975; Urbán et al., 2014). Problematic online gaming was assessed using the Problematic Online Gaming Questionnaire (POGQ) (Demetrovics et al., 2012). Online gaming motives were assessed using three different questionnaires. The Motives for Online Gaming Questionnaire (MOGQ) measured the motivation based on the game characteristics (Z. Demetrovics et al., 2011). The other two measures the underlying motivation of the gamers. GAMS (Gaming Motivation Scale) (Lafrenière et al., 2012) was developed based on the Self-Determination Theory and PENS (Player Experience of Need Satisfaction) measures the basic needs of players (Rigby & Ryan, 2007).

Main results and discussion

It was hypothesized that general psychiatric distress has both a direct and indirect effect (via the mediating effect of MOGQ and GAMS gaming motives factors) on problematic online gaming by game types. M/MORPG players showed the highest full effect size via MOGQ with 42%. The strongest elements were the escapism and competition and coping also emerged. Escapism, fantasy and coping emerged in the model of M/MOFPS players as mediator motivations. It looks like that the social and competition elements correlate with the problematic behavior although they have no role in the mediation model. Because of the lower significance level in the model of M/MORTS and other game types players we need to handle these results carefully. Both models show similarity to the M/MOFP players model with the emerging escapism and fantasy elements. We could imagine more reasons in the background of lower significance. First of all a new game type emerged at that time when we conducted the research, the Multiplayer Online Battle Arena (MOBA). This type mixes the characteristics of M/MORTS and M/MORPG games (Johnson, Nacke, & Wyeth, 2015). Users may choose to add these games under other groups which may change the original motivational patterns. It could be also important that M/MORTS gamers showed lower connection to problematic play in the second study also.

The weaker routs disappeared in the mediation models via GAMS related to the original model in the third study. Introjected regulation had the strongest effect size in all the game types than amotivation beside that all the other elements had negligible effect size or lower significance level. The broadest pattern was showed by M/MOFPS players which may be related to their younger age. In this case they can try out themselves in different ways in the game (Jansz, 2005). The mediating effect of psychiatric distress via SDT motivation is proved by the models and M/MORPGs showed the biggest effect sizes. It may possible that this game type offers the broadest online environment and possibilities to players.
### Table 1: The summary table of the mediation model result by game types with the standardized effect size of the mediation pathways, the direct and indirect pathways and the total variance

<table>
<thead>
<tr>
<th></th>
<th>M/MORPG (N=874)</th>
<th>M/MOFPS (N=760)</th>
<th>M/MORTS (N=430)</th>
<th>Other online games (N=629)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOGQ: Social</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>MOGQ: Escapism</td>
<td>0.11***</td>
<td>0.07***</td>
<td>0.06*</td>
<td>0.06*</td>
</tr>
<tr>
<td>MOGQ: Competition</td>
<td>0.02***</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>MOGQ: Coping</td>
<td>0.03***</td>
<td>0.01***</td>
<td>0.03*</td>
<td>-</td>
</tr>
<tr>
<td>MOGQ: Skill development</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>MOGQ: Fantasy</td>
<td>-</td>
<td>0.05***</td>
<td>0.03*</td>
<td>0.03*</td>
</tr>
<tr>
<td>MOGQ: Recreation</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Direct effect</td>
<td>0.39***</td>
<td>0.33***</td>
<td>0.39***</td>
<td>0.38***</td>
</tr>
<tr>
<td>Indirect effect</td>
<td>0.17***</td>
<td>0.13***</td>
<td>0.13***</td>
<td>0.12***</td>
</tr>
<tr>
<td>Total R²</td>
<td>0.42***</td>
<td>0.33***</td>
<td>0.41***</td>
<td>0.35***</td>
</tr>
<tr>
<td>GAMS: Intrinsic mot.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>GAMS: Integrated reg.</td>
<td>0.04**</td>
<td>0.04**</td>
<td>-</td>
<td>0.04**</td>
</tr>
<tr>
<td>GAMS: Identified reg.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>GAMS: Introjected reg.</td>
<td>0.17***</td>
<td>0.16***</td>
<td>0.16***</td>
<td>0.12***</td>
</tr>
<tr>
<td>GAMS: External reg.</td>
<td>-</td>
<td>0.02**</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>GAMS: Amotivation</td>
<td>0.07***</td>
<td>0.06***</td>
<td>0.05***</td>
<td>0.06***</td>
</tr>
<tr>
<td>Direct effect</td>
<td>0.29***</td>
<td>0.20***</td>
<td>0.29***</td>
<td>0.26***</td>
</tr>
<tr>
<td>Indirect effect</td>
<td>0.27***</td>
<td>0.27***</td>
<td>0.21***</td>
<td>0.24***</td>
</tr>
<tr>
<td>Total R²</td>
<td>0.57***</td>
<td>0.47***</td>
<td>0.51***</td>
<td>0.51***</td>
</tr>
</tbody>
</table>

*Sig. *p < .05. ** p < .01. *** p < .001*
4 Summary

The study of online gaming in Hungary is an important field of research due to the wide usage of this recreational activity impairing problematic user behaviors as it was found in a number of different countries. It is important to note that our research based on the Hungarian population is providing unmet data by analyzing the online gamers as a whole, and this way allowing to compare the different user subgroups.

User trends and socio-demographic characteristics of game types

We were able to identify four online game categories based on the literature including: M/MORPGs, M/MOFPSs M/MORTSs and other online games (Ghuman & Griffiths, 2012). Most studies focus on the M/MORPG-k (Cole & Griffiths, 2007; M. D. Griffiths et al., 2003; Grusser et al., 2005; Grusser et al., 2007; Hussain & Griffiths, 2009; B. D. Ng & P. Wiemer-Hastings, 2005; Nick Yee, 2006a) while we know a little about the game characteristics of the other game types (Ghuman & Griffiths, 2012; Jansz & Tanis, 2007). Because of this as a first step we decided to analyze whether these gamers have a certain preference regarding game type. Due to the fact that 79% of online gamers were possible to be categorized into a clear game type it is supporting the hypothesis that there is a certain psychological need behind these behaviors (Nagygyörgy és mtsi., 2013). This might provide an answer why some people tend to play too much and why small gamer communities have an increased risk to evolve unfavorable gaming behaviors (D. J. Kuss & M. D. Griffiths, 2012), however the complete clarification requires future research. We can conclude that the choice of gamers depends on their socio-demographic characteristics. Because of this, it might be beneficial to treat the different groups based on these factors. The games might change by time, however it is important to note that these findings help us to understand the psychological need of different groups and consequently to act more efficiently in treating and preventing this behavior.

Comparison of game types based on motivational and problematic factors

As a conclusion we can say that our results shed light on the motivational differences and due to this the problematic factors of different gamer types. The group of M/MORPG gamers was found to be the most vulnerable as they scored the highest in the scale of problematic factors compared to other game types. It is an interesting fact that the most frequent motivations of this group, except one, could be related to problematic user behaviors. This provides an answer why this is the most well studied group of online gamers (J. P. Charlton & I. D. Danforth, 2007; Cole & Griffiths, 2007; M. D. Griffiths, M. N. Davies, & D. Chappell, 2003; Mark D Griffiths et al., 2004; Hussain & Griffiths, 2009; Nick Yee, 2006a). However, it doesn’t mean that we don’t have to study the other game types, instead because of the strong M/MORPG focus of previous studies, we have to highlight that there are different motivations related to problematic factors in different groups. These results could provide an answer for the psychological background of game type selection.

The analysis of these relations might be useful in gamification also. Understanding the psychology of online gaming is not only useful in gaming community but also to understand everyday fields where the game elements can be used for different purposes.
Gaming motivation and the fulfilling of needs

Gamers fulfill their competency needs mostly through the motivation of competing and self improvement. Due to this it is not a surprise that M/MOFPS gamers reported the highest competency experience. The research of Ryan et al. (2006) proved that this factor predicts most likely if a person would return to a game. Gamers experienced higher autonomy and attachment in the M/MORPG. This finding is not a surprise as it has been reported before (Deci & Ryan, 2011), that the feeling of autonomy depends on the amount of choices and the freedom provided by the game design. These factors were highly represented in M/MORPGs, like virtual worlds where gamers can go wherever they want and face a number of different challenges (Cole & Griffiths, 2007). Relatedness, as we have seen before, can be related to social factors which are higher in M/MORPG games as gamers can interact with each other in a more complex way (Ryan et al., 2006). The complexity of interaction is also higher compared to other online game types.

Mediation models

It has been proved by mediation models that psychiatric distress not only affects problematic gaming in a direct way but also through motivations. The game structure based measuring system revealed great differences between different types, however, the results based on the STD hypothesis showed very similar controlling mechanisms between these gaming types. We can suppose that by analyzing the controlling mechanisms we can gain more general tools to filter out problematic behaviors, while the motivations of game structure can help us to specify personal motivations and needs. As this is a complex process, identification of problematic gamers could be the first step followed by therapeutic treatment as it has been seen before in the case of other behavioral addictions, where the identification of general symptoms requires a parallel analysis of personal factors.

Gaming is not always problematic

It is important to note that problematic factors are not related to recreational activity in any of these models. Based on the literature we can say that online gaming can be a healthy hobby (Király et al., 2015). It is important to highlight these facts because online gaming is often demonized by the media while it is becoming an increasingly popular recreational activity. Online games can be a place where children can gain experiences and interact with each other and if they are forbidden they might feel that they are out of a community experience. Online games provide a complex social and cultural field, which can be used in different ways by gamers (Kallio, Mayra, & Kaipainen, 2010).

Limitations

Video games constantly change and improve. It is possible that new game types appear in the near future, however our study sheds light on the different psychological needs fulfilled by different game types. Because of this the analysis of psychological background should be an important part video game research. As a further limitation of the present study we have to mention that the data was gained online and the questionnaires were filled self voluntarily based on personal experiences. It is also important to note that the trends were based on the answers of the Hungarian online gamers. Because of this there are issues regarding the generalizability of the data. Despite of the limitations the present study can be considered as a first step towards gaining robust data and a benchmark knowledge of the main types of MMOG player. To date, this is the largest study to compare gamers with different game preferences and to identify their dominant characteristics.
Future plans

The study also raised further meaningful questions that are worth studying. In the future, it would be interesting to investigate the stability of gaming preference over time. Moreover, in case of the mixed preference group, which makes up nearly one fifth of the gamer population, it would be interesting to assess whether a primary preference develops over time or, on the contrary, whether the mixed preference is due to the loss of a former preference. Future studies could also examine personality or motivational characteristics (Demetrovic és mtsai, 2011), associated with the preference for specific types of gaming and the extent to which problem gaming is linked to these preferences. An optimal supplementary of the present research would be a longitudinal study analyzing the evolution of online gaming. This research could provide answers to the ratio of leaving online games and that what psychologic and socio-demographic factors affect the gamers for remaining online game users. It could be a interesting point to study the reasons behind online gaming as it can provide answer to the question why some gamers lose control over the hours spent by game while in other cases they decide to leave the online gamer culture.
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