Interpersonal dependency and online gaming addiction

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Background and aims: The present study explores the relationship between social motivations and addiction to online gaming and if that possible connection can be explained by the personality traits responsible for social functioning. *Methods:* We employ Bernstein's concept of interpersonal dependency to distinguish healthy dependency, dysfunctional detachment, and destructive overdependence, and Charlton and Danforth's conceptualisation of online gaming addiction and high engagement. An online questionnaire was administered to a self-nominated sample of 4,074 online gamers. Two regression models were constructed to separately explain gaming addiction and high engagement using social motivations to play, while controlling for age, gender, and time spent online. *Results:* High scores on subscales measuring dysfunctional detachment and destructive overdependence were positively associated with online gaming addiction, while healthy dependency was negatively correlated with addiction scores. In contrast, the overall role of social motivation was negligible. *Discussion:* People with healthy relationship profiles are less likely to develop problematic patterns of online gaming. High in-game engagement, although sharing some factors with addiction, was only poorly explained by the study variables, suggesting the mutual exclusiveness of addiction and engagement.

Keywords: online gaming addiction, high engagement, interpersonal dependency, motivations to play

INTRODUCTION

During the last decade and a half, Massive Multiplayer Online Games (MMOGs) have become a significant entertainment medium to which millions of young people devote a large portion of their leisure time (Williams, Yee, & Caplan, 2008). Although mere entertainment and leisure activity for most gamers, a certain proportion report that online gaming took over their lives and caused serious problems in their social or occupational functioning (Haagsma, Pieterse, Peters, & King, 2013). Health-related negative consequences are also among the symptoms of excessive patterns of online gaming and include low quality and quantity of sleep, neglecting meals or poor and unhealthy diet, repetitive strain injuries, etc. (c.f. Kalmus, Siibak, & Blinka, 2014 for an overview). The most excessive players may spend 40 hours or more per week online, which equals or exceeds the amount of time spent in a regular full-time job (Dauriat et al., 2011). Online gaming has been shown to be the riskiest online activity in terms of the development of Internet addiction and related problems (Blinka et al., 2015).

The American Psychiatric Association included *Internet Gaming Disorder* in Section 3 of its revised diagnostic manual, DSM-5, as a potential future diagnosis that requires further investigation (American Psychiatric Association, 2013). However, whether problematic patterns of online gaming represent a distinct psychiatric condition that belongs among behavioural addictions is not yet a matter of consensus within the scientific community (Griffiths, King, & Demetrovics, 2014). Although Griffiths' criteria (2005) of behavioural addiction were generally accepted in the research of online gaming addiction, not all criteria were identified as similarly contributing to the increase of

pathology. Peripheral criteria (euphoria, cognitive salience, and tolerance), especially when dominantly present without core criteria (behavioural salience, withdrawal symptoms, relapse, and conflict), seem to be signs of non-pathological gaming (Charlton & Danforth, 2004). Such high engagement in online gaming, although extensive at first glance but non-problematic at the second, is not connected to those personality traits which are associated with pathological gaming (Charlton & Danforth, 2007, 2010). This suggests that high engagement and addiction, although overlapping in some symptoms, are rather distinct categories and thus point toward the usefulness of differentiating approaches in measuring Internet gaming addiction. The addictive potential of online games is usually associated with the reward aspects of gaming (King, Delfabbro, & Griffiths, 2011). However, MMOGs are inherently social environments and thus the social aspects of games, the social motivations of gamers, and their sociability may play an important role. As shown by Ng and Wiemer-Hastings (2005), MMOGs are played much more intensively compared to non-MMOGs. The difference is the community – while offline video games are solitary or a small-group activity; thousands of people are online in MMOGs at the same time. MMOGs represent a rich and valued source of social contacts for gamers through in-game interactions, discussion forums, and also communication beyond the gaming tasks (Cole & Griffiths, 2007; Yee, 2006). It has also been reported that collective gaming, necessary for reaching advanced in-game

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content, leads to more time spent online and may contribute to the development of patterns of compulsive gaming (Haagsma et al., 2013). According to the Social Compensation Hypothesis (Caplan, 2003; Davis, 2001), lonely individuals are especially prone to compulsive Internet use as they seek social support, which they lack in their natural offline environment. Such gamers may then be caught in a vicious circle – with increasing time spent online for in-game social interactions and in-game group commitments, there may follow a negative effect on daily functioning and face-to-face interactions, and the sense of loneliness may worsen (Davis, 2001; Shen & Williams, 2011). From this point of view, the social motivation for gaming (i.e. the seeking of in-game social support) can be expected to contribute to increased addictive gaming. Nevertheless, such a direct relationship has not yet been confirmed. Several studies indicate that this relationship is rather negligible (Blinka & Mikuška, 2014; Caplan, Williams, & Yee, 2009; Dauriat et al., 2011; Kardefelt-Winther, 2014; Király et al., 2015). According to Blinka and Mikuška (2014), a gamer's social skills and personality traits, such as lower interpersonal trust and lower social self-efficacy, contribute to the development of pathological gaming more than the actual social motivation for gaming. Gamers with schizoid personality traits and higher introversion are reported to be more at risk of problematic online gaming (Kuss & Griffiths, 2012). This finding indicates that the underlying psychological dispositions of individuals may be the key to the relationship between social motivations and online gaming addiction, and to the development of online gaming addiction.

Interpersonal dependency represents a useful concept to study the social traits of gamers in relation to potential pathological game play. The concept itself describes how people rely on others – how their cognition, motivation, affective responses, and actual behavioural patterns are affected by relationships to others (Bornstein, Porcerelli, Huprich, & Markova, 2009). The concept is, to some extent, similar to the concept of attachment; for instance, high levels of interpersonal dependency share some similarities with insecure attachment (Pincus & Wilson, 2001).

Bornstein et al. (2003) divided the idea of interpersonal dependency into a three-dimensional concept. The three dimensions of interpersonal dependency are *healthy dependency* (confidence and autonomy, desire for closeness, and situation-appropriate help seeking) representing healthy functioning; and two representing dysfunctional functioning – *destructive overdependence* (characterised by weak self, fear of negative evaluation, and reassurance seeking) and *dysfunctional detachment* (fear of being hurt, fear of being overwhelmed by others, and consequent need for control over social situations) (Bornstein et al., 2003). Individuals with unhealthy interpersonal dependency traits tend to be more sensitive to peer pressure, less stable in their attitudes and beliefs, and have a more pronounced need for acceptance by others (Bornstein, 2009). These characteristics may be associated with negative consequences and feelings in some social contexts and situations, but may be effective and useful in others.

Destructive overdependence and dysfunctional detachment may underlie the effect of dysregulation in individuals

that may, subsequently and reportedly, put individuals at risk of psychological and physiological disease (Fiori, Consedine, & Magai, 2008). Individuals scoring high in interpersonal dependence face more psychological impairment through decreased lower self-esteem and increased depression, loneliness, and overall emotional dysregulation (Overholser, 1992). When observed, the association between interpersonal dependency traits and substance use disorders (e.g. smoking and alcoholism) was generally linked to orally dependent personality features (Greenberg & Bornstein, 1988). The link between dependency traits and the tendency to addictive behavioural patterns might, therefore, lead to the compensation of unsatisfying or imperilling social contacts in real life. Thus, as online games are inherently social environments, we assume that interpersonal dependency and the conceptualizing social orientation of the individual might be a significant factor explaining why some gamers tend to pathological gaming while others do not.

RESEARCH FOCUS AND HYPOTHESES

In the present study we examine social motivations as conscious preferences and personal traits represented by the three dimensions of interpersonal dependency in relationship to highly engaged and addictive gaming.

Based on a literature review we expect the followings:

H1: Social motivations do not play an important role in online gaming addiction, and online gaming addiction is predicted by personality traits related to social functioning. Social situation was expected to contribute to problematic gaming by some researchers (Lemmens, Valkenburg, & Peter, 2011). However, the relationship between online gaming addiction and social motivations, which may be a conscious reflection of the lack of social contact, is not supported in literature.

H1a: Destructive overdependence is positively associated with online gaming addiction. We expect that personal traits associated with orientation towards social commitment and the need for positive feedback from the community may be an important factor that contributes to higher addictive potential in these gamers.

H1b: Dysfunctional detachment is positively associated with online gaming addiction. We expect that the MMOG environments, where it is easy to control social interactions and there is a lack of face-to-face interactions, attract gamers who score high in dysfunctional detachment.

H1c: Healthy dependency is negatively associated with online gaming addiction. We expect that the healthy dependency personality trait, usually associated with healthy social functioning, is negatively associated with online gaming addiction.

H2: High engagement in online gaming is not, in contrast to online gaming addiction, significantly associated with the social motives and psychological traits significant for social functioning. A large number of motives for online gaming has been identified (King et al., 2011; Koo, 2009; Yee, 2006). We assume that intensive yet non-pathological gamers enjoy the game for these various reasons and thus

they are not a group with any unified gaming pattern nor psychological trait or distress.

METHODS

Participants

The data come from the first wave of a three-wave longitudinal online survey of Internet gaming addiction. A total sample of 6,730 Czech and Slovak online gamers was recruited through advertisement in online gaming magazines, on gaming discussion forums, and on guild websites. The ads targeted the core of the Czech and Slovak gaming community, with heavy players expected to be the highest proportion. Incentives in the form of lottery prizes were used to solicit higher participation. The questionnaire was published in Czech on the Lime Survey platform in the spring of 2013. A subsample of 4,074 players (ages 10–68; M = 20.81, SD = 5.95; 93.50% male) of MMORPG and MOBA games was selected for the analysis, and measurement tools were developed specifically for these types of games. Participants spent between 2 and 92 hours per week playing online games (M = 32.85, SD = 16.72); League of Legends (MOBA, 35.22%) and World of Warcraft (MMORPG, 19.69%) were the most played games in the sample. Female players were significantly older compared to males (Females: M = 21.79, SD = 6.80; Males: M = 20.75, SD = 5.88; $p < 0.05$); and spent significantly less hours gaming per week (Females: M = 27.85, SD = 15.84; Males: M = 33.20, SD = 16.73; $p < 0.001$).

Measures

Online gaming addiction was measured using the Addiction-Engagement Questionnaire (AEQ), a 24-item tool with response options on a four-point scale (1 – strongly disagree; 4 – strongly agree). The tool distinguishes between online gaming addiction (12 items) and high engagement in online games (12 items). The addiction subscale focuses on core addiction criteria, such as conflict, behavioural salience, and withdrawal, while the engagement subscale measures peripheral addiction criteria, such as cognitive salience, euphoria, and tolerance (Charlton & Danforth, 2007, 2010). Since the scale was not validated for discriminatory purposes, it is used as a continuum. Both subscales had sufficient internal consistency (Cronbach's α = 0.79 for addiction and Cronbach's α = 0.72 for high engagement). We created two new combined variables for addiction and engagement as mean scores of the respective subscales ranging from 1 to 4 (M_{ADD} = 1.82, SD_{ADD} = 0.49; M_{ENG} = 2.50, SD_{ENG} = 0.26).

The frequency of online gaming, expressed in weekly playing hours, was constructed as a combined measure using two open-ended questions: "In the last 3 months, how much time (in hours) did you usually spend gaming on a normal working day?" and "In the last 3 months, how much time (in hours) do you usually spend gaming on a day off?" Respondents who did not play in the last three months (i.e. obtained zero in the combined frequency variable) were excluded from the analysis.

To obtain information about game genre, respondents were asked to name a game they played most often in the last three months. Only players of MMORPG and MOBA games were included in the analysis, as the AEQ scale contained some items relevant only to these types of games (i.e. questions on virtual character, levelling, collecting armour, etc.).

Interpersonal dependency was measured using 30 items of the Relationship Profile Test (RPT) (Bornstein, Geiselman, Eisenhart, & Languirand, 2002). The scale distinguishes between destructive overdependence (Cronbach's α = 0.81), healthy dependence (Cronbach's α = 0.63), and dysfunctional detachment (Cronbach's α = 0.67), with 10 items providing answer options ranging from "very true" to "not at all true" and representing each subscale. The three new variables, created as mean scores of each sub-scale, ranged between 1 and 5 (M_{DO} = 2.95, SD_{DO} = 0.75; M_{HD} = 3.63, SD_{HD} = 0.56; M_{DD} = 3.22, SD_{DD} = 0.60).

Social motivations for online gaming were measured using two subscales based on eight items selected from the pool of the most commonly used questionnaires on player's motivations (Hsu, Wen, & Wu, 2009; Koo, 2009; Yee, 2006). Examples of the items are: "I like talking to other players"; "I enjoy being part of the gaming community"; "I sometimes share worries with other players"; and "I appreciate when fellow players offer support in my real-life situations." The four-point response scale (strongly disagree – strongly agree) focused on respondents' attitudes rather than actual behaviour. The exploratory factor analysis showed two factors – team play (five items) and social support (three items). Both scales had sufficient internal consistency (Cronbach's α = 0.75 for team play and Cronbach's α = 0.70 for social support). The final variables were created as mean scores of the respective items and ranged between 1 and 4.

Data analysis

Pearson's correlation coefficients were calculated for addiction, engagement, and all predictors. Two separate regression models were constructed using a stepwise hierarchical linear regression to determine the association between online gaming addiction / engagement and social motivations / interpersonal dependency traits, while controlling for age, gender, frequency of online gaming, and game genre.

Ethics

According to rules of Masaryk University, the study did not require approval of ethical committee. In line with the university's ethical guidelines (CTT, 2015), details about the study aims, procedures, and the data collected were provided on the first page of the questionnaire. As the participation was solicited via online advertisement and parents of the underage children could not be addressed directly, minors were requested to confirm that they would participate in the survey with parental approval.

RESULTS

Pearson's correlation coefficients indicate a statistically significant relationship between addiction and all predictors; addiction is negatively correlated with the healthy-dependency-personality trait ($r = -0.18$, $p < 0.01$) and age ($r = -0.23$, $p < 0.01$). There is no relationship between the motivations for in-game social support and high engagement ($r = -0.03$, $p = 0.07$). Time spent online is associated to both addiction ($r = -0.34$, $p < 0.01$) and engagement ($r = -0.11$, $p < 0.01$), although the effect is stronger for addiction. The association with the negative aspects of interpersonal dependency – destructive overdependence and dysfunctional detachment – is stronger for addiction than for engagement in online gaming. The two negative aspects correlate positively, while there is a negative association with healthy dependency. Healthy dependency is negatively correlated with addiction and positively with both types of social motivations, while there is either no or negligible association between social motivations and negative dependency traits. Team play is negatively associated with both addiction and engagement. The correlation between social support and healthy dependency indicates that these two concepts may be related. The need for in-game social support also increases with age. Table 1 summarizes the results of the correlational analysis.

Table 2 shows three linear regression models explaining online gaming addiction by using the main interpersonal dependency subscales and social motivations. It confirms that the negative aspects of interpersonal dependency are positive predictors for online gaming addiction (hypotheses H1a and H1b), while there is a significant negative association with healthy dependency (hypothesis H1c). The main effect of social motivation is small and has only a limited impact on the relationship between addiction and interpersonal dependency. Adding interpersonal dependency variables into the model reduces the effect of social motivations; team play, particularly, becomes non-significant in the third regression step. Overall, the final model explains 25% of the variance of online gaming addiction. Thus, we consider the whole hypothesis H1 as confirmed.

Table 3 shows similar models for engagement to online games as a dependent variable; the effect of the predictors is less pronounced and the final model explains only 8% of the variance of online gaming engagement. Contrary to online gaming addiction, adding dependency traits into the model

slightly increased the effect of social motivations in the final model. The need for social support is a positive predictor for online gaming addiction patterns, but it is negatively associated with high engagement and this effect, although small, remains significant despite the interpersonal dependency traits in the final model. Thus, we cannot fully support hypothesis H2 – the associations are opposite in comparison to addiction; however, small but significant association with social motivation and interpersonal dependency traits still exist.

DISCUSSION

The present study confirmed that interpersonal dependency traits are crucial in developing addictive behaviours discounting from the social motivation factors. Both, dysfunctional detachment and destructive overdependence increase the online gaming addiction score, while healthy dependency is associated with lower addiction scores. The relationship between various addictions and overdependence has been reported in literature (Loas et al., 2005) and our study extends the evidence of its relationship to online gaming addiction. It must be noted that dysfunctional detachment and destructive overdependence are not mutually distinct categories. On the contrary, they are often found together (Bornstein et al., 2003, 2009) and they were also mildly correlated in our research. In the case of online gaming, that means that some of the pathological gamers may use MMOGs as an escape to a more secure and controlled social environment and, at the same time, seek the social support and recognition of fellow gamers. A concept very closely related to healthy dependency is connectedness (Bornstein, 2009). Decreased connectedness has been reported to be associated with increased general problematic Internet use (McIntyre, Wiener, & Saliba, 2015). Our final model explaining the 25% variance of online gaming addiction is completed with demographic- and gaming-style variables – gender does not play a role, while younger gamers (those preferring the MOBA genre to MMORPG and those spending more time in the game) seem to be more susceptible. While the facts that younger gamers are more at risk of gaming addiction and that the gender effect is rather negligible have been shown in literature (Caplan et al., 2009), the change in the effect of the game genre is new information. Traditionally, MMORPGs like World of

Table 1. Correlations of main study variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Addiction (1)	–	.25**	.29**	.22**	−.18**	.10**	.13**	−.23**	.34**
Engagement (2)		–	.12**	.15**	.07**	.12**	.03	−.19**	.11**
Destructive overdependence (3)			–	.28**	−.20**	.03	.07**	−.18**	.07**
Dysfunctional detachment (4)				–	−.18**	−.19**	−.08**	.02	−.01
Healthy dependency (5)					–	.27**	.19**	.00	−.03
Team play (6)						–	.49**	−.23**	.19**
Social support (7)							–	−.06**	.15**
Age (8)								–	.21**
Frequency of gaming (9)									–

Note: **$p < .01$

Table 2. Linear regression models for online gaming addiction (method: stepwise)

	Model 1			Model 2			Model 3		
	b	β	Sig.	b	β	Sig.	b	β	Sig.
Constant	1.81		<.01	1.81		<.01	1.14		<.01
Gender (Female = 1, Male = 2)	−0.04	−0.02	0.17	−0.03	−0.02	0.28	−0.01	0.00	0.79
Age	−0.01	−0.14	<.01	−0.01	−0.15	<.01	−0.01	−0.10	<.01
Frequency of gaming	0.01	0.30	<.01	0.01	0.29	<.01	0.01	0.27	<.01
Genre (MMORPG = 0, MOBA = 1)	0.08	0.08	<.01	0.08	0.08	<.01	0.08	0.09	<.01
Team play (TP)				−0.05	−0.06	<.01	0.02	0.02	0.26
Social support (SS)				0.06	0.10	<.01	0.06	0.09	<.01
Destructive overdependence (DO)							0.11	0.17	<.01
Dysfunctional detachment (DD)							0.14	0.17	<.01
Healthy dependence (HD)							−0.11	−0.13	<.01
F		146.75			104.12			131.50	
P		<.001			<.001			<.001	
R Square		0.14			0.15			0.25	

Table 3. Linear regression models for high engagement in online gaming (method: stepwise)

	Model 1			Model 2			Model 3		
	b	β	Sig.	b	β	Sig.	b	β	Sig.
Constant	2.59		<.01	2.50		<.01	2.01		<.01
Gender (Female = 1, Male = 2)	0.00	0.00	0.87	0.00	0.00	0.80	0.00	0.00	0.89
Age	−0.01	−0.16	<.01	−0.01	−0.14	<.01	−0.01	−0.13	<.01
Frequency of gaming	0.00	0.09	<.01	0.00	0.08	<.01	0.00	0.08	<.01
Genre (MMORPG = 0, MOBA = 1)	0.01	0.03	0.14	0.01	0.02	0.25	0.02	0.03	0.09
Team play (TP)				0.04	0.09	<.01	0.04	0.10	<.01
Social support (SS)				−0.01	−0.04	0.03	−0.02	−0.06	<.01
Destructive overdependence (DO)							0.02	0.07	<.01
Dysfunctional detachment (DD)							0.07	0.17	<.01
Healthy dependence (HD)							0.04	0.10	<.01
F		37.07			28.01			36.38	
P		<0.001			<0.001			<0.001	
R Square		0.04			0.04			0.08	

Warcraft were shown to be the environment which tended to attract or produce problematic gaming patterns. The fact that the newly emerging MOBA genre even surpasses the MMORPGs should be further investigated together with other possible emerging trends in the gaming industry.

High involvement in online gaming, on the other hand, is less connected to the psychological underpinning of impairments in interpersonal relationships and can be seen more as controlled, although time-consuming, behaviour. This suggests that highly engaged and addicted gamers are a qualitatively distinct category and that they differ not only in the mere quantity of the activity. Such a result is in line with the previous findings of Charlton and Danforth (2010) and gives support to the approach of measuring Internet gaming addiction that distinguishes types of involvement. Our model combines demographic variables, personality traits, and social motivation for gaming, and explained only 8% of the variance of engagement points to online gaming as an entertaining activity, which is not necessary to problematize. Similar results have been reported elsewhere, though different methods were used (e.g. Griffiths, 2010; Király et al., 2015).

Healthy dependency is positively associated with both types of social motivation, while there is a negligible relationship between social motives and destructive overdependence, and a negative relationship between social motives and dysfunctional detachment. Social motives, therefore, prevail in people who show a healthy need for social contact, and online games are efficient sources for social interaction. For some authors, motivations to play represent conscious choices that are key to understanding the etiology of excessive patterns of online gaming (Kardelfelt-Winther, 2014). In this view, the problematic patterns of online gaming are not understood as addiction but rather as maladaptive coping strategies. This approach, however, does not explain why only a few of those who report similar motivations to online gaming find themselves hooked on the game, and why some develop extreme symptoms of addiction that lead to neglecting basic drives. Our analysis indicates that this view may be correct in terms of high involvement in online gaming, but when it comes to loss of control, psychological factors play a role in the subsequent development of the pathology. Billieux et al. (2015) report similar results when demonstrating that social motivations are more typical for regulated role-play gamers

than for hard-core and unregulated players. Indeed, online gaming addiction has been repeatedly shown to be associated with motives for immersion and escapism and with achieving better in-game content and rewards (e.g. King et al., 2011; Király et al., 2015; Kirby, Jones, & Copello, 2014).

A stronger relationship also exists between the time spent playing and online gaming addiction than with time spent playing and high engagement. This finding suggests that highly engaged gamers may have a sense for balance and can effectively control the impact of gaming on their real-life affairs. Psychological dispositions, then, are the underlying cause for reduced self-control and, subsequently, of disproportionate time spent online. This would be in line with research showing that disinhibition may manifest itself only in certain contexts, while in other situations individuals may perform normally and show sufficient levels of self-control (Hofmann, Friese, & Strack, 2009). The lack of self-control in online gaming might piggyback on unrelated psychological discomfort, in this case as unsatisfying social contacts as a result of unhealthy interpersonal dependency traits.

The limitations of this study are associated with the fact that, unlike interpersonal dependency traits, motivations to play and the level of involvement in online gaming may vary over time. The cross-sectional nature of the present study, therefore, cannot capture the whole complexity of the relationships delineated earlier in this text. It should also be acknowledged that our data come from a non-representative, self-selected sample of Czech and Slovak online gamers. However, this fact should not compromise the correlational analysis (Gosling, Vazire, Srivastava, & John, 2004).

Online gaming addiction, distinguished here from high engagement in online gaming, is not a medical diagnosis and should be interpreted with regard to the respective measurement instrument. The addiction subscale of the AEQ stresses those symptoms of addictive behaviours that either represent various types of present conflict or factors that may directly lead to one (i.e. behavioural salience, relapse, and reinstatement) (Charlton & Danforth, 2007). We, therefore, cannot claim that negative interpersonal dependency traits are predictors of addiction, but they certainly are associated with such patterns of online gaming that put an individual at risk of adverse consequences in many areas of life. People with healthy relationship profiles are less likely to develop these problematic patterns of online gaming.

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