Cognitive and psychological predictors of the negative outcomes associated with playing MMOGs (massively multiplayer online games)

Ming Liu a, Wei Peng b, *

a Department of Telecommunication, Information Studies, and Media, Michigan State University, East Lansing, MI 48824, USA
b Department of Telecommunication, Information Studies, and Media, 409 College of Communication Arts and Sciences, Michigan State University, East Lansing, MI 48824, USA

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Abstract

This study integrates research on problematic Internet use to explore the cognitive and psychological predictors of negative consequences associated with playing massively multiplayer online games (MMOGs). Participants recruited from online discussion boards completed self-report measures on their online game-related cognitions and psychological condition, social skills, psychological well-being, and negative life outcomes associated with game playing. The results demonstrated the important roles that psychological dependency and deficient self-regulation play in negative consequences associated with online gaming. The results also indicated that psychological dependency on MMOGs was predicted by cognitive preference for a virtual life—a construct that is negatively related to social control skills.

1. Introduction

Playing massively multiplayer online games (MMOGs) has been linked to many negative life outcomes (Brian & Wiemer-Hastings, 2005; Chuang, 2006; Cole & Griffiths, 2007; Griffiths, Davies, & Chappell, 2003). Recent research has demonstrated that online gaming is one of the most likely reasons for problematic Internet use (Ducheneaut & Moore, 2004; Meerkerk, Van Den Eijnden, & Garretsen, 2006; Morahan-Martin & Schumacher, 2000). Among the medical community and the public, there is also a growing concern for online gamers especially children and adolescents who spend an excessive amount of time playing online games and consequently give up important real life activities. The American Medical Association (2007) recently called for more research on the impact of video games to decide whether “video game addiction” should be listed as a mental disorder in the 2012 edition of the American Diagnostic and Statistical Manual of Mental Disorders (DSM).

Research on addictive media use is still very limited (Caplan, 2005; Widyanto & Griffiths, 2006). Excessive time spent on media use definitely displaces other activities in life and results in negative consequences. However, besides the amount of time spent, psychological and cognitive variables also play an important role. As limited theory-guided research is available to explain the underlying mechanisms and predictors of negative consequences of excessive media use, the main purpose of this study is to identify those cognitive and psychological factors that are associated with the negative life consequences of MMOG playing.

2. Literature review

2.1. Negative life consequences

A great deal of research has been conducted to examine the negative life consequences associated with online gaming or other types of Internet use. In some studies, negative consequences are part of the operationalizations or diagnosis criteria of addictive or problematic use (Caplan, 2002; Charlton & Danforth, 2007; Young, 2004). In Ng and Wiemer-Hastings’ (2005) video game study, players of massively multiplayer online role-playing games were found to encounter more usage problems than offline video game players, including playing for more than 8 continuous hours, losing sleep, being told that they spend too much time playing, spending less time with offline friends, and valuing less offline social relationships.

In this study, negative life consequences associated with MMOG playing are classified into three general types based on prior literature—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), and professional/academic problems (i.e., missing work or school, deteriorated performance) (Charlton & Danforth, 2007; Chen, Weng, Su, Wu, & Yang, 2003; Suhail & Bargoes, 2006; Young, 2004).

2.2. Psychological dependency

Dependency was traditionally used to describe physical dependency, “the adaptations that result in withdrawal symptoms when
drugs, such as alcohol and heroin, are discontinued” (O’Brien, Volkow, & Li, 2006). Griffiths (2000) suggested that technological addictions were a subset of behavioral addictions which featured the core components of substance addiction. In recent Internet studies, several different terms have been suggested and used by scholars to describe the syndrome (e.g., pathological Internet use (PIU), problematic Internet use, excessive Internet use, compulsive Internet use, Internet dependency, etc.). The term “dependency” is presently used by American Psychiatric Association in DSM-IV for this type of issues. In the context of Internet use, it is also generally agreed by researchers that “Internet addiction” is “a psychological dependency on using the Internet regardless of the type of activity once logged on” (e.g., Caplan, 2002; Kandell, 1998; Kubey, 1996).

Therefore, we adopt the term “dependency” to describe the psychological state in the context of playing MMOGs. In the present study, psychological dependency is defined as a psychological condition that withdrawal symptoms will occur when MMOG playing is not available as expected. LaRose, Lin, and Eastin (2003) reviewed research on media addiction and summarized the general symptoms of Internet addiction, including preoccupation, tolerance, relapse, withdrawal, loss of control, life consequence, concealment, and escapism. In the context of playing MMOGs, Charlton and Danforth (2007) used factor analysis to distinguish addiction and high engagement. The results showed that conflict (with other activities), withdrawal, relapse and reinstatement, and behavioral salience were symptoms of addiction; cognitive salience, tolerance, and euphoria were indeed the indicators of high engagement of games. Among these constructs, withdrawal—the negative emotions or unpleasant feeling states that occur when game playing is discontinued or suddenly reduced (Griffiths, 2000), most closely reflects the psychological condition of people with MMOG dependency.

Negative consequences of media use have been studied extensively in the context of excessive Internet use (e.g., Kraut, Patterson, Lundmark, Kiesler, Mukopadhyay, & Scherlis, 1998; Kubey, Lavin, & Barrows, 2001; Punamäki, Wallenius, Nygård, Saarni, & Rimpelä, 2007; Suhail & Bargees, 2006). A number of researchers have demonstrated the significant associations between Internet users’ psychosocial state (e.g., preoccupation, excitement, withdrawal) and the negative outcomes of Internet use at home and work (for a review, see Widyanto & Griffiths, 2006). We propose that a similar relationship exists for MMOG playing—a specific Internet application.

H1: Psychological dependency on MMOG is positively related to (a) physical problems associated with MMOG playing, (b) personal life problems associated with MMOG playing, and (c) academic or professional problems associated with MMOG playing.

2.3. Preference for a virtual life

The present study, introduces the construct of preference for a virtual life (PVL) as a cognitive contributor of psychological dependency on MMOG playing. The PVL construct is based on two closely related constructs proposed in Davis’ (2001) and Caplan’s (2003, 2005) Internet studies: maladaptive cognitions (Davis, 2001) and preference for online social interaction (Caplan, 2003, 2005).

The construct of maladaptive cognitions was introduced by Davis (2001) in his PIU (pathological Internet use) model as a necessary and proximate cause of PIU symptoms. Maladaptive cognitions are cognitive distortions of some Internet users about the self and the world. Distorted thoughts regarding the self are characterized by extreme self-concepts favoring the online self, such as “I am worthless offline, but in the online game world I am someone.” Cognitive distortions about the world are thoughts that overgeneralize one’s environment and favor the online world based on one’s limited experience, such as “Nobody loves me offline,” and “The online game world is the only place that I am respected.” Using this cognitive-behavioral approach, Davis (2001) argued that it was the maladaptive cognitions characterized by this all-or-nothing thinking that directly led to and intensified an individual’s PIU. In addition, Davis (2001) stated that this model could be applied to not only the general Internet use but also various Internet applications such as online gaming.

Building on Davis’ work, Caplan (2003, 2005) proposed and examined preference for online social interaction (over offline social interaction), a construct focusing on the social use of the Internet and describing cognitive preference instead of cognitive distortions as described by Davis (2001). Preference for online social interaction refers to the beliefs that one will perform better and feel better about oneself in online social interactions and relationships than in similar offline activities. Caplan (2003) also discussed possible explanations for the preference by reviewing literature on the advantages of computer-mediated interpersonal communication over face-to-face communication, such as greater anonymity, the presence of hyperpersonal communication (Walther, 1996), decreased adherence to social norms, etc. His survey of undergraduate students demonstrated that participants’ degree of preference for online social interaction was a significant predictor of their problematic Internet use.

Based on these two constructs, this study introduces the PVL construct, which is defined as one’s cognitions or beliefs that one will perform better, feel better about oneself, and perceive to be better treated by others in the virtual online game world than in offline or real life. For example, by identifying with game characters who can achieve various unusual goals in MMOGs, gamers may regard themselves as more valuable and successful people in the game world than in the offline real world, and this may lead to unpleasant feelings or withdrawal symptoms when MMOG playing is suddenly unavailable. Online game players may also have a cognitive bias that they are better treated by others in the virtual game world due to the hyperpersonal effect (Walther, 1996) of computer-mediated communication. Therefore, we propose that:

H2: Preference for a virtual life will be positively related to psychological dependency on MMOG playing.

This present research also examines the contributors of PVL, including social control skills, loneliness, and depression. Prior research has suggested that social use of the Internet is especially “addictive” and can easily become excessive (Davis, 2001; Morahan-Martin & Schumacher, 2000; Young, 1998). Caplan (2005) proposed a social skill model of problematic Internet use which posited that preference for online social interaction was negatively predicted by one’s perceived level of social control skills. Social control skill is “an individual’s competence at self-presentation, role taking, and impression management in F2F interpersonal interactions” (p.724). For those who have low social control skills, online social interaction becomes the alternative channel to satisfy their social needs in offline situations. Results in Caplan’s (2005) study confirmed the negative association between one’s perceived social control skills and preference for online social interaction.

Davis’ (2001) cognitive-behavioral model of PIU suggests that psychosocial problems (e.g., loneliness, depression, social anxiety) are the distal and necessary cause of PIU. Davis (2001) argued that psychosocial problems predisposed individuals to be especially vulnerable to PIU; these problems must be present for PIU symptoms to take place, although the problems alone may not be sufficient to cause PIU symptoms. Caplan (2003) further explained the underlying
mechanism and argued that individuals suffering from psychosocial problems tend to have a stronger preference for online social interaction, which in turn led to compulsive Internet use. Results of his study indicated that both loneliness and depression were significant predictors of preference for online social interaction.

Playing MMOGs is essentially a social activity which encourages or even requires players to interact with each other (Brian & Weimer-Hastings, 2005; Cole & Griffiths, 2007; Ducheneaut & Moore, 2004). Social interactions in the virtual game world are a core component of the gaming experience for many MMOG players. The virtual life in the online game world involves unlimited opportunities of alternative social interactions and will be especially appealing to individuals who have relatively low social skills and experience loneliness and depression. Therefore, we hypothesize that:

- H3a: Social control skills will be negatively related to preference for a virtual life.
- H3b: Loneliness will be positively related to preference for a virtual life.
- H3c: Depression will be positively related to preference for a virtual life.

2.4. Deficient self-regulation

Another relevant cognitive variable that may contribute to the negative outcomes of online gaming is self-regulation, a construct imported from Social Cognitive Theory (Bandura, 1991). Self-regulation plays a critical role influencing human behaviors. Self-regulation is one’s ability to direct his or her own behavior instead of being passively affected by external influences. Three interactive stages are usually involved in the self-regulatory process: self-monitoring, self-judgment, and self-reaction. In the initial self-monitoring stage, people pay attention to or observe their own performances as well as the various effects caused by their conduct. In the next stage of self-judgment, people evaluate a given performance either using personal standards or comparing it with the performance of others. Self-reaction is the last stage which directly affects a person’s behavior change. Based on the outcome of self-judgment, people either reinforce the behavior that is positively evaluated or abstain from pursuing an action that results in negative self-judgment. Moreover, self-regulation is presumed to be context dependent in the social cognitive theoretical framework. That is, self-regulation of a person in one situation may be high but low in another different domain (Schunk, 2001). LaRose and colleagues (LaRose & Eastin, 2004; LaRose, Mastro, & Eastin, 2001; LaRose et al., 2003) explored the self-regulation mechanism in the context of Internet use and proposed to use the “deficient Internet self-regulation” construct to account for Internet usage and addition. They argued that the essential problem of Internet dependency was a deficit in self-regulation regarding Internet usage (LaRose et al., 2003).

In the present study, we propose that self-regulation in the context of playing MMOGs can play an important role in the development of negative life consequences associated with MMOG playing. This theory-based perspective allows researchers to investigate whether MMOG players are capable of avoiding negative consequences on their own through self-monitoring, self-judgment, and self-reaction. In fact, signs of deficient self-regulation are often observed in MMOG players. For instance, a player may fail to track how much time he or she has spent in one gaming session (lack of self-monitoring). A player may also have difficulty reducing play time although he or she has already realized that too much gaming caused negative impact on his or her offline activities (inadequate self-reaction). Therefore, we propose that:

H4: Deficient self-regulation of MMOG is positively related to (a) physical problems associated with MMOG playing, (b) personal life problems associated with MMOG playing, and (c) academic or professional problems associated with MMOG playing.

3. Methods

3.1. Participants and procedures

Invitation messages including the URL to an online questionnaire were posted on popular MMOG discussion boards on Facebook and Yahoo! Groups. The incentive used was a raffle drawing chance and the awards offered were Amazon electronic gift cards. A total of 288 active MMOG players participated in this study. One hundred and ninety-one (66.3%) were male, 87 (30.2%) were female, and the gender of 10 (3.5%) was undisclosed. The average age of the participants was 27 years old. On average, the participants had a 5-year history of playing MMOGs (SD = 3.42). Most of the participants played the popular MMOGs such as World of Warcraft, Final Fantasy, Runescape, etc. The participants spent, on average, 30 h per week playing MMOGs (SD = 21.24). Compared with Williams, Yee, and Caplan’s (2008) study of 7000 players of the MMOG EverQuest 2, the sample in the present study had more female respondents. Also, participants in this study were 4 years younger and spent 5 h more per week on playing MMOGs.

3.2. Variables and measures

3.2.1. Negative life consequences

Three types of negative life consequences associated with MMOG playing were measured using scales from Liu and Peng (2008) preliminary study that built upon previous research concerning problematic Internet use. An example item to measure physical problems is “I experience fatigue due to prolonged online gaming.” “Online gaming has reduced my offline contact with people” is an example item to measure personal life problems and “Because of playing online games I have missed my classes/work” is an example item to measure academic/professional problems. A 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree) was used. Physical problems (six items) yielded a Cronbach’s α estimate of .80. Personal life problems (five items) obtained a Cronbach’s α value of .81. The 3-item scale for academic/professional problems yielded a Cronbach’s α value of .75.

Psychological dependency on MMOG was measured with the adapted withdrawal subscale of the Generalized Problematic Internet Use Scale (Caplan, 2002). The withdrawal subscale asks respondents to rate their agreement with the following five statements: “I feel preoccupied with online gaming if I cannot connect for some time,” “I miss online gaming if I cannot go on it,” “When not playing my online game, I wonder what is happening there,” “I feel lost if I cannot play my online game,” and “It’s hard to stop thinking about what is waiting for me in my online game.” Another original statement was also included which was based on the definition of withdrawal: “I feel restless, moody, depressed, or irritable when attempting to cut down or stop online gaming.” Participants rated their agreement with each item on a 7-point Likert-type scale. Cronbach’s α was .85.

Preference for a virtual life was measured with seven items, including four items adapted from the examples that Davis (2001) used to elucidate maladaptive cognition, such as “I am a more valuable person in the online game world than in real life” and “I am more respected in the online game world than in real life.” The other three items were adapted from Caplan’s (2005) measure of preference for online social interaction. For instance,
3.2. Social control skills

Following Caplan (2005), the present study adopted the social control subscale of Riggio’s (1989) Social Skill Inventory to measure offline social control skill. Participants rated the 15 items regarding role playing and social self-representation in offline contexts using a 7-point Likert-type scale. Examples of items include “I can be comfortable with all types of people” and “I can easily adjust to being in just about any social situation.” Cronbach’s α was .80.

3.2.3. Loneliness and depression

Perceived loneliness was assessed with 10 items from the widely used UCLA Loneliness Scale (Russell, 1996), and Cronbach’s α was .91. Level of depression was measured using the 7-item short form of the Center for Epidemiological Studies Depression Scale (Mirowsky & Ross, 1992). Cronbach’s α was .88.

Deficient online gaming self-regulation was assessed by four items which were adapted from previous studies of Internet use (Caplan, 2002; LaRose et al., 2003; Suhail & Bargees, 2006): “I would go out of my way to satisfy my urges to play online games,” “I lose track of time when online gaming,” “It is difficult for me to keep myself away from playing online games,” and “I have repeatedly made unsuccessful efforts to control, cut back, or stop online gaming.” Participants rated their agreement with each item on a 7-point Likert-type scale. Cronbach’s α was .76.

3.3. Data analyses

Data were analyzed using SPSS, Windows Version 13.0. Hierarchical multiple regression models were run to test the hypotheses in this study controlling for relevant variables (i.e., sex, age, race, weekly time spent on MMOG playing).

4. Results

Descriptive statistics suggested that participants, on average, were experiencing low level of psychological dependency on MMOG playing (M = 3.04, SD = 1.24) and MMOG related negative life consequences including physical problems (M = 2.94, SD = 1.26), personal life problems (M = 2.85, SD = 1.31), and academic/professional problems (M = 2.70, SD = 1.44). Participants also reported a moderate level of deficient self-regulation of MMOG (M = 3.26, SD = 1.30) and relatively low preference for a virtual life to real life (M = 2.71, SD = 1.36). Their social control skills were moderately good (M = 4.64, SD = 1.05). In addition, the participants reported low levels of loneliness (M = 2.04, SD = .71) and depression (M = 1.70, SD = .68).

The first and fourth hypotheses predicted that psychological dependency on MMOG playing as well as deficient self-regulation of MMOG would be positively related to the negative life consequences of MMOG playing, including physical problems, personal life problems, and professional or academic problems. Both hypotheses were supported. Hierarchical regressions were estimated for each hypothesized relationship and the results were summarized in Table 1. The final models all accounted for a substantial amount of the variance in the dependent variable (36–55%). The results indicated that psychological dependency on MMOG playing (β = .40–.44, p < .001) and deficient self-regulation of MMOG (β = .27–.40, p < .001) were both strong predictors in each of the final models (see Table 1). In the final model of personal life problems, age (β = .10, p = .05), being Asian (β = .10, p = .05), and weekly play time (β = .13, p < .01) were found to be additional significant predictors.

The second hypothesis predicted that PVL would be positively related to psychological dependency and it was supported. The control variables of sex, age, and race were the first to enter the regression model. In the next step, weekly time spent on online gaming was added to the model. PVL was last entered into the analysis. The results showed that the demographic variables in step 1 barely explained any variance in MMOG dependency (1%). When adding weekly play time, the model was significantly improved (F = 27.33, p < .001) and the independent variables together explained 11.5% of the variance. Explained variance was further increased to 26.6% after PVL was entered, and the change was also significant (F = 46.57, p < .001). In the final model, both PVL (β = .41, p < .001) and weekly play time (β = .23, p < .001) emerged as significant predictors of psychological dependency on MMOG playing controlling the effects of the other variables.

A similar procedure was followed to test the third hypothesis predicting that a lack of social control skills, depression, and loneliness would be positively related to PVL. The demographic variables entered in step 1 only explained 1.1% of the variance in PVL. The second model involving weekly play time explained 7.3% of the variance, and the increase was significant (F = 15.39, p < .001). The final model which included social control skills, depression, and loneliness explained 22.8% of the variance in PVL, a significant increase over the second model (F = 15.39,
p < .001). In the final model, social control skills (β = −.34, p < .001), weekly play time (β = .21, p < .01), and being Asian (β = .13, p < .05) emerged as individually significant predictors of PVL.

5. Discussion

The goal of this research was to employ theory and research on Internet addiction to understand the cognitive and psychological factors that contribute to the negative consequences of playing MMOGs. Toward this end, the present study integrated Davis (2001) PII model, Caplan’s (2003, 2005) social skill model of problematic Internet use, and the self-regulation account of Internet use (Bandura, 1991; LaRose & Eastin, 2004; LaRose et al., 2001, 2003). In general, this study confirmed the important roles that psychological dependency (H1) and deficient self-regulation (H4) play in the negative consequences associated with MMOG playing. Moreover, the present study demonstrated that individuals who perceive the virtual game world as better and more attractive than real life would be especially likely to experience psychological dependency on MMOG playing (H2).

This study further examined the impact of offline social skill (H3a), loneliness (H3b), and depression (H3c) on PVL. The present data confirmed that offline social control skills was negatively associated with PVL (H3a), providing support for Caplan’s (2003, 2005) social skill account of problematic Internet use that individuals with deficient social control skills tend to perceive the Internet, a mediated communication environment, to be less threatening and thus prefer to have social interactions online instead of offline. In other words, online social interaction may become a solution or an alternative way to satisfy the social needs of people with incompetent social skills, and thus leads to beliefs favoring a virtual life in the online game world. The data however did not support the influence of loneliness (H3b) or depression (H3c) on PVL. In a recent study, Caplan (2007) suggested that the variable of social anxiety might work better than loneliness at predicting preference for online social interaction. Liu and Kuo (2007) found a positive correlation between social anxiety and Internet addiction. In addition, Liu and Peng (2008) conducted a preliminary study using data collected in China and examined the impact of shyness on dependent online gaming. Shyness was found to be a positive predictor of online gaming dependency (β = .34, p < .001). Therefore, to improve the present model, further research is needed to determine the most influential psychosocial or personality variables that may predict PVL.

5.1. Implications

The findings in the present study provided support for the self-regulation account (Bandura, 1991; LaRose et al., 2003) and the social skill model (Caplan, 2003, 2005) of problematic Internet use in the specific context of playing MMOGs. InSeay and Krat’s (2007) study, they found a longitudinally negative relationship between one’s general self-regulation and problematic online gaming. Similarly, a negative correlation between one’s self-control ability and online game addiction was shown in Kim, Namkoong, Ku, and Kim’s (2008) research. Social Cognitive Theory seems to be a very useful theoretical frame to further examine the mechanisms underlying MMOG dependency.

The present study confirmed the importance of examining certain psychological and cognitive antecedents beyond time spent on game playing when assessing problematic online gaming. Time spent on gaming is a straightforward but inadequate indicator of online game dependency. Results of the hierarchical multiple regression analyses showed that time spent on MMOG playing had limited and inconsistent impact on psychological dependency and associated variables. Similarly, Caplan and High (2006) suggested that problematic Internet use went beyond an excessive amount of time spent online, and there was a need to include cognitive variables in studies of problematic Internet use. In their study, they found that cognitive preoccupation moderated the association between the amount of Internet use and negative outcomes of Internet use. These findings indicate that simply reducing the amount of time spent on online gaming may not be an effective solution to prevent or recover from online game dependency if the cognitive and psychological problems remain. Parents and educators should be aware of that and pay enough attention to the psychological condition of young players of MMOGs. Additionally, revealing the underlying mechanisms associated with MMOG dependency will also inform intervention researchers the fundamental problems online gamers may have.

5.2. Limitations and future research

Several limitations of the present study need to be acknowledged. First, the generalizability of the results toward other MMOG players is unclear. In this study, respondents were recruited from the discussion boards of MMOG online groups. Compared to online gamers not participating in these groups, our participants may be relatively more interested in social networking or computer-mediated communication and value the social use of MMOGs more. Identifying methods to access and recruit a large representative sample of MMOG players would benefit future research.

Second, with a cross-sectional rather than a longitudinal design, it is impossible to determine causality in the present study (Caplan, 2005). Awareness of this issue is required when interpreting the findings. Researchers need to conduct longitudinal studies in the future to determine the causal relationships and also begin to explore the potential reciprocal relationships among the constructs. Finally, this study focused on the somewhat negative psychological constructs to explain MMOG dependency. Researchers can also begin to investigate the impact of some positive cognitions such as the positive outcome expectations of MMOG playing from a social cognitive perspective (Grusser, Thalemann, & Griffiths, 2006; Lin, Ko, & Wu, 2008).

References


