

Addictive Use Due to Personality: Focused on Big Five Personality Traits and Game Addiction

Eui Jun Jeong, Hye Rim Lee

Abstract—This study examined whether big five personality traits affect game addiction with control of psychological, social, and demographic factors. Specifically, using data from a survey of 789 game users in Korea, we conducted a regression analysis to see the associations of psychological (loneliness/depression), social (activities with family/friends), self-efficacy (game/general), gaming (daily gaming time/perception), demographic (age/gender), and personality traits (extraversion, neuroticism conscientiousness, agreeableness, & openness) with the degree of game addiction. Results showed that neuroticism increase game addiction with no effect of extraversion on the addiction. General self-efficacy negatively affected game addiction, whereas game self-efficacy increased the degree of game addiction. Loneliness enhanced game addiction while depression showed a negative effect on the addiction. Results and implications are discussed.

Keywords—Game addiction, big five personality, social activities, self-efficacy, loneliness, depression.

I. INTRODUCTION

RECENTLY, games have become important contents in the cultural industry markets. Game industry has been leading the growth of cultural industry in Korea. Games are used by whole generations inclusive of young adolescents and silver groups without limit of time and space.

With the pervasion of gaming culture, however, some negative effects like game addiction have been focused on as a serious social problem [1], [2]. Game addiction is considered to be either a pathological disease or a disorder in users' self-regulation [1]. Although it is not yet fully included in the Diagnostic and Statistical Manual of Mental Disorders (5th ed., DSM-5) [3], many scholars have reported that it is likely to cause psychological and social problems with symptoms of self-control disorder [1], [2], [4].

Game addiction has been reported to be related to a user's psychological characteristics such as loneliness and depression [5]-[7]. Many studies have also shown that problems in social relationship are related to game addiction [5], [7]. In studies about individual features, a user's self-efficacy such as (online) game and (offline) general self-efficacy has been proved to have a strong relationship with game addiction [1], [6]. In addition, demographic variables such as gender and age, and gaming time have been reported to be associated with the degree of game addiction [1]-[8]. Furthermore, recent empirical

studies have verified the significant relationship of user personality traits with Internet use in various settings [9], [10]. The use of Internet services and has an association with user personality [9]. Likewise, Internet addiction was reported to be related to user personality traits such as neuroticism and extraversion [5], [10]. However, related to game addiction, relatively little research has emphasized on the role of user personality traits with considerations of control factors such as psychological, social, gaming, and demographic variables in game studies. This study, therefore, fills this gap by investigating the effects of personality traits on game addiction with control of related factors with data of 789 game users in South Korea. Specifically, the current study examines whether each of big five personality trait (i.e., extraversion, neuroticism, conscientiousness, agreeableness, and neuroticism) affects game addiction by controlling for psychological variables (loneliness, depression), social relationship (activities with family and friends), self-efficacy variables (general self-efficacy, game self-efficacy), demographic variables (age, gender), daily gaming time, and user perception toward gaming.

II. LITERATURE REVIEW

A. Internet and Game Addiction

Game addiction has been regarded as one of Internet addiction types including gambling, chatting, cyber-sex, and Internet game addiction [1], [8]. Thus, most of game addiction studies have focused on Internet (online) game addiction related to negative effects such as psychological problems and social isolation [1], [4], [6].

Internet addiction has been referred to as "Internet Addictive Disorder (IAD)" [11], "Generalized Problematic Internet Use (GPIU)" [12], or "Pathological Internet Use (PIU)" [1], [12]. Internet addiction means excessive use of Internet services as to lose controlling ability in social relationship and daily works. The addictive symptoms include withdrawal, tolerance, salience, and dependence [1], [8], which occurs in pathological addictions such as the alcoholic, gambling and material addicts as well. Game addiction, thus, generally implies the uncontrollable state of a user's daily life with serious psychological, social, and physical problems from playing games [1], [3], [4].

There are two perspectives in the approach to game addiction [13]. One approach is to view the game addiction as a pathological disease. In this viewpoint, game addiction symptoms are evidence of a disease which cannot be cured by the users themselves: Specialized treatments are required to handle the pathological symptoms (i.e., withdrawal, tolerance,

Eui Jun Jeong is currently an Assistant Professor in the Dept. of Digital Culture & Contents at Konkuk University (e-mail: jeong12@konkuk.ac.kr).

Hye Rim Lee and Ji Hye Yoo are with the Digital Culture & Contents Department, University of Konkuk, Seoul, South Korea (e-mail: nevercry21@naver.com, puresea@hanmail.net).

etc.) in this sense [4], [8]. The other approach is to regard the addictive use as a symptom of cognitive disorder. In this perspective, the symptoms are evidence of the lack of a user's cognitive self-regulation (i.e., deficient self-regulation) [5], [14]. Studies in this viewpoint assert that most addictive adolescents can back to their daily routines for themselves as they grow older without medical treatment.

So far, there is no winner in game studies between the two different perspectives. However, although the two perspectives have a crucial difference in the approach to the game addiction and its symptoms (disease vs. deficient self-regulation), they commonly say that there are antecedent factors to the degree of game addiction [13].

B. Antecedents of Game Addiction

In order to point out antecedents of game addiction, prior literature has paid considerable attention to such factors as psychological, social, gaming, and demographic variables [1], [2], [6], [8]. Regarding psychological variables, loneliness and depression have been focused on because of their strong associations with game addiction [15], [16]. The higher people feel loneliness, the deeper they become addicted to games. People who feel higher degree of loneliness may use online games more to satisfy their needs of relationships than those in lower degree. Likewise, people in depression are likely to degrade themselves and feel difficulty in making friends and keeping social relationships [17].

Social relationship is also one of important factors which affect game addiction [4], [6], [8]. Previous studies indicate that people in lack of social activities are more susceptible to game addiction [1], [18]. Related to psychological variables, people who have limited social relationships or activities are likely to be isolated and feel depressed. Thus, it is highly probable for them to be indulged in playing games to fill the deficiency in social relationship.

Self-efficacy has also been proved to be related to the degree of game addiction. Self-efficacy refers to conviction or belief to the ability to successfully perform any task [19]. Related to game addiction, (online) game self-efficacy was reported to have a positive relationship with game addiction while (offline) life self-efficacy is negatively related to the addiction. People who are in lack of social relationship offline may willingly make friends online to fulfill their social desires. Thus, children with higher degree of game addiction were reported to have close online friends than those with lower degree [20]. In line with that, people with higher degree of online game self-efficacy tend to be addicted to games than those with lower degree of game self-efficacy [1].

Gaming time also has been reported to have a close relation with game addiction. Young [4] indicated the importance of accessibility in relation with game addiction. Accessibility means the chance of using the Internet (or games) for users. Accessibility, thus, can be applied to the frequency or time-length of playing games: The more frequently a user plays games, the more the user may experience negative symptoms of game addiction [1], [8].

Based on the finding of previous literature, we test the

following hypotheses with control of other variables.

- *H1(a/b): (a) Loneliness and (b) depression will increase the degree of game addiction.*
- *H2(a/b): (a) Social activities with family and (b) social activities with friends will decrease the degree of game addiction.*
- *H3(a/b): (a) Self-efficacy in online gaming (game self-efficacy) will increase the degree of game addiction, while (b) self-efficacy in offline daily life (life self-efficacy) will decrease the degree of game addiction.*
- *H4: Controlling for other variables, daily gaming time will be positively related to the degree of game addiction.*

C. Personality Traits and Game Addiction

Personality is "the enduring emotional, personal, interpersonal, experiential, attitudinal and motivational style that explains individual's behavior in different situations" [21] (p. 105). Personality has been reported to affect Internet use and the degree of Internet addiction [9], [10]. For example, [9] showed the relationship between personality and Internet use. Likewise, deGraft-Johnson and his colleagues [10] exhibited a significant relationship between personality traits and video game preference.

Among personality traits, neuroticism and extraversion have been highlighted due to their strong relationships with Internet use [9], [22]. Extraversion has a positive association with leisure services for men, while neuroticism has a negative relationship with information services [22]. Regarding Internet addiction, the more addicted to the Internet, the higher did show users in neuroticism, but the lower in extraversion, agreeableness, and conscientiousness [10]. However, little has been conducted on the relationship in game settings. Recently, one study [23] tested whether there is any difference in user extraversion between addictive (problematic) users and non-addictive users. But, the result was not significant comparing to those in Internet user studies. This study, thus, examines the association of personality traits with game addiction by using Big Five Personality Traits, controlling for other variables.

Considering the previous papers, below hypotheses will be tested:

- *H5(a/b/c/d): Controlling for other variables, (a) extraversion, (b) conscientiousness, (c) agreeableness, and (d) openness will decrease the degree of game addiction.*
- *H5(e): Controlling for other variables, neuroticism will increase game addiction.*

III. METHOD

A total of 789 participants were surveyed for two weeks in South Korea. Participants ranged in age from 16 to 59. They are randomly selected in Seoul, the capital city. In gender, considering the ration of gender, men were 395 (50.1%) while women were 394 (49.9%). In age groups, likewise, considering the ratio of each age group, teens were 45 (5.7%), 20's were 160 (20.4%), 30's were 187 (23.7%), 40's were 203 (25.8%), and 50's were 194 (24.6%). All participants received 5,000

KRW (about 5 USD) for their involvement in the survey.

For assessing Game addiction, we revised Young's degree of Internet addiction scale to measure the individual a degree of game addiction by adding "gaming" to the questions (e.g., Do you try to hide how long you've been gaming?) [4], [7]. The scale consists of 20 items in the form of a 5-point Likert scale ($\alpha = .91$). For the measure of personality traits, Big Five Personality Scale was used. The scale consisted of summed scores based on individual items set on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree) [2] ($\alpha = .87$).

Depression was measured with the CESD (center for epidemiological studies depression). The CESD is a subset of the 11-item CESD scale and has been used extensively in general populations [24]. The scale items are about the user's degree of sadness, gloominess, well-sleeping, willingness to do something, etc ($\alpha = .74$). The variable of loneliness symptoms were measured with the UCLA Loneliness Scale [25]. The scale consists of 20-items designed to measure one's subjective feelings of loneliness as well as feelings of social isolation.

The measure of social relationship with friends (and with family) was measured by three items for each variable. The measure considered the frequency with their friends (family) in meeting, co-activities, and dialogue number (3 items respectively). This scale has been used in other game addiction studies [1] ($\alpha = .84$, with family; $\alpha = .80$, with friends).

Game self-efficacy (online game) was created by modifying the computer self-efficacy scales. The scale is about conviction or confidence toward a user's ability to control over the games ($\alpha = .87$). For general (life) self-efficacy, we created scales by modifying the General Self-Efficacy scales. The scale contains 12 items that are rated on a 5-point scale [1] ($\alpha = .85$).

As another control variable, we measured the participants' (user) perception toward gaming by asking them to answer the question "I think that game is a good." using 5-point scales ranging from 1 (strongly disagree) to 5 (strongly agree) with 3 items. ($\alpha = .83$). Daily gaming time was measured by asking users to check their average hours spent on games, from 1 (less than 30 minutes) to 8 (more than 6 hours per day).

Finally, Big Five Personality Traits were measured by the 44-item Big Five Inventory (BFI) scale developed by John and Srivastava [26]. The inventory includes 9 items for extraversion ($\alpha = .81$), 8 for neuroticism ($\alpha = .89$), 9 for conscientiousness ($\alpha = .80$), 9 for agreeableness ($\alpha = .82$), and 10 for openness ($\alpha = .82$) with 5-point scale.

IV. RESULTS

The average amount of time participants spent playing games each day was about 54 minutes ($M=1.79$, $SD=1.19$), with men playing for 59 minutes ($M=1.95$, $SD=1.30$) a day and women for 48 minutes ($M=1.61$, $SD=1.03$). The average game addiction score was 46.0 ($SD=15.9$). In correlation test, there was significant relationship between game addiction and extraversion ($r=-.13$, $p<0.01$), neuroticism ($r=.22$, $p<0.01$), general self-efficacy ($r=.18$, $p<0.01$), game self-efficacy ($r=.64$, $p<0.01$), user perception ($r=.36$, $p<0.01$), loneliness ($r=.28$, $p<0.01$), depression ($r=-.15$, $p<0.01$) and daily gaming time ($r=.31$, $p<0.01$). However, family relationship and friend

relationship were not significantly correlated with game addiction.

To test the hypotheses, we used a regression analysis. Fig. 1 shows the results of regression analysis. Regarding personality traits, the results showed that, controlling for other variable, neuroticism is an important antecedent to the degree of game addiction ($\beta=.228$, $p<.01$) even though the other personality traits were not. Psychological variables were also significantly predicted the degree of game addiction.

Loneliness had a significant positive effect ($\beta=.221$, $p<.01$) but, interestingly, depression did a significant negative effect on game addiction ($\beta=-.223$, $p<.01$). Both self-efficacy variables exhibited significant associations with game addiction: general self-efficacy showed a negative effect ($\beta=-.257$, $p<.05$) while game self-efficacy did a positive effect ($\beta=.602$, $p<.001$). However, no significant relationship was found between social relationship variables and game addiction. Likewise, demographic variables (gender and age), daily gaming time, and user perception did not show any significant effect on game addiction.

V. DISCUSSION

This study examined the effects of user personality traits on game addiction controlling for other variables such as psychological, social, and demographic variables. In the association between personality traits and game addiction, we found a strong effect of neuroticism on game addiction. This is in line with previous results in Internet studies [10], [22]. Neurotic people generally become easily anxious and furious about in hardships, thus they are likely to engage in virtual space to escape the hard situation. For this result, there could be another explanation from the cognitive perspective. People in higher neuroticism are easily aroused and are difficult to control their emotions in specific situations. Actually, gaming environments where various unpredicted things happen by intention in a quick tempo could enhance the strength of user excitation much greater than the real life environments. This could drive the neurotic game users to the state of deficient self-regulation followed by game addiction symptoms [13], [14]. Contrary to our expectations, however, the other personality traits such as extraversion, conscientiousness, agreeableness, and openness did not show any significant relationship with game addiction. Particularly, this result is different from that in Internet studies [10]. We reason that this could be partly because of the gaming environments – degree of user interactivity and involvement. Different from other Internet activities, game plays (e.g. MMORPGs) need more active engagements with the user's own role and specific missions. Game users, thus, sometimes need to be gentle, open-minded, organized to other users (or members in a game community) in order to achieve their own missions. These active involvements could decrease the discrepancy between active and passive users in their activities in games, which may cause difference in the effects of such personality traits between game users and Internet users. Future studies need to explore more about such influential factors and their relationships in personality effects.

With respect to psychological variable, both loneliness and depression showed significant relationships with game addiction. Loneliness showed a strong positive effect on game addiction as previous studies exhibited [15], [16]. Interestingly, depression showed a negative effect on game addiction. We reason that there could be any mediators (or moderators) between depression and game addiction. One general explanation for the association between loneliness and game addiction is that the more people feel loneliness the higher they are engaged in virtual space in order to fill the paucity of offline relationship. Generally, different from lonely people, depressed

one may have little willingness to do anything energetically. Even though one feels lack of social relationship, he/she may feel difficult to make any plan to solve the problem. Thus, there could be any moderators or mediators which activate between depression and game addiction. Some previous studies reported mixed results about the association between depression and game addiction. For example, [6] suggested that preference to virtual space could mediate in the relation. Future studies need to examine any mediators between psychological variables and game addiction.

	Beta ^a	t-value ^a	p ^a
(Constant) ^a		.994 ^a	.322 ^a
Depression ^a	-.223** ^a	-2.841 ^a	.005 ^a
Loneliness ^a	.221* ^a	2.439 ^a	.016 ^a
Family activities ^a	-.070 ^a	-1.115 ^a	.267 ^a
Friend activities ^a	-.042 ^a	-.576 ^a	.566 ^a
Game self-efficacy ^a	.602*** ^a	9.009 ^a	.000 ^a
General self-efficacy ^a	-.257* ^a	-2.517 ^a	.013 ^a
User perception ^a	-.067 ^a	-1.018 ^a	.311 ^a
Gender (Male = 1) ^a	.112 ^a	1.708 ^a	.090 ^a
Age ^a	.026 ^a	.353 ^a	.725 ^a
Daily gaming time ^a	.115 ^a	1.748 ^a	.083 ^a
Extroversion ^a	.058 ^a	.658 ^a	.512 ^a
Neuroticism ^a	.228** ^a	2.742 ^a	.007 ^a
Conscientiousness ^a	.044 ^a	.493 ^a	.623 ^a
Agreeableness ^a	.084 ^a	.976 ^a	.331 ^a
Openness ^a	-.009 ^a	-.094 ^a	.925 ^a
N ^a		789 ^a	

Fig. 1 The regression analysis results: R square = .581 (p<.001), *p<.05, **p<.01, ***p<.001

There was an opposite direction in the effects between general self-efficacy and game self-efficacy. The more people feel conviction in their life, the less they are addicted to games; but, the more they feel conviction in games, the more they are likely to be engaged in the games. However, there was no significant relationship between family relationship and game addiction. This seems partly because of a ceiling effect in collecting data. The average number of family activities was 5.34 (max=7), which implies that more than 60% of participants checked over 5 (dialogue with parents 1-2 times a month). Future studies need to use different scales for social

relationship measurement.

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