

Characteristics of Internet Use in Relation to Game Genre in Korean Adolescents

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ABSTRACT

As the number of internet users increases, a new game genre using the internet as a networking tool is emerging. Some game genres are regarded as having greater addiction potentials than others. Games and the internet are closely related. We investigated games frequently used by adolescents and classified each of them with the help of game professionals. We also examined internet use patterns to identify relationships between game genre and internet use patterns. 627 middle school and high school students (male 488, female 139) completed questionnaires concerning computer and game use patterns and Korean internet addiction scales. Game genres were divided into eight criteria (simulation, role playing game, web board, community, action, adventure, shooting, and sports). Using Korean internet addiction scales, 627 participants were divided into a normal group (474), a potential risk group (128), and a high-risk group (25). Each group showed significant differences in total internet addiction scores. We classified players into specific game users based upon the game types they most prefer. Role playing game users showed significantly higher internet addiction scores than web board and sports game users. Game and internet addictions are also connected with interpersonal relationship patterns. We suggest that users of some game genre have unique psychological addiction potentials that are different from others and that this influences both game selection and internet use.

INTRODUCTION

INTERNET USE IN KOREA has increased dramatically and has become a major part of daily life¹. Adolescents are major users of the internet. Negative personal effect of internet use is getting greater attention. The internet has been blamed for decreased shared family time, strains upon personal relationships, decreased productivity in employment settings, perpetuation of false information, and the development or exacerbation of psychological problems². Excessive online game use, especially, has emerged as a major social concern due to the social and family

conflicts. In clinical practice, problems originating from excessive internet and game use are frequently seen, although they do not always occur at a level leading to a diagnosis.

Problematic internet use can be found within any age group, social, educational, or economic range. In the past, those who were internet addicted have been stereotyped as predominantly young, introverted, and computer-oriented males. But the availability of computers and easy access to the internet is quickly changing this notion.² Thus, an investigation of internet use patterns according to different social and cultural situations is needed.

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Electronic game and internet use are closely inter-related. Games are frequently run on a computer. At the same time, internet is mainly accessed by computer until now. For example, with the availability of three-dimensional (3D) graphics, it is now possible to build 3D visual representations in the virtual world. Users can see and interact with others in these worlds. These massively multi-player, online role-playing games (MMORPGs) are run continuously in real time on the internet. They feature strong social and competitive aspects, making devotion to the game mandatory³.

Many studies have focused on the relationship between the internet and online games that are directly related to internet use.^{3,4} There are also many genres of electronic games, including online games. There has not been much consensus concerning game genres. But it's possible to use some popular classifications for defining them. Frequently, games are divided according to their contents. Games can be divided into simulation games, role playing games (RPG) includes the previously mentioned MMORPG, web boards, community, action, adventure, shooting and sports games.

The types of games continue to diversify. Research on actual game use patterns cannot always reflect the rapid changes and developments in the gaming industry. Since the genres of games are rapidly changing and developing, we need to consider the properties of these games and their psychological effects. As the internet becomes more popular, newer games are emerging. These games are based on networks, and require considerable intellectual ability. The characteristics of online computer game players and their associations with internet use with respect to addiction have been previously reported.^{3,4} However, simple arcade games are still one of the most actively played and developing genres. This suggests that there might be differences in internet and game use patterns, including addiction tendencies, based upon preferred game genres. We attempted to determine the actual prevalence of internet addictions in Korea and investigated the game use patterns, and compared the characteristics of the game users based on these patterns.

METHODS

Subjects and procedures

We recruited adolescent participants from one high school ($n = 322$) and two middle schools ($n = 308$). The schools were located in the southeast area of Seoul, South Korea. Each adolescent participated after obtaining permission. Data was collected with the cooperation of the teacher in charge in each class.

MEASURES

For research, basic questionnaires inquiring about computer and internet use patterns, and Korean internet addiction tests were used.

Basic questionnaires requiring computer and internet using patterns. "Usual" computer use and game playing patterns were examined. The most preferred game was requested and the genre of that game was determined by agreement of two experts in the game field. The games were divided into eight criteria (simulation, role playing, web board, community, action, adventure, shooting, and sports). These criteria were also used in another paper published in Korea.⁵

The Korean internet addiction test.^{6,7} This internet addiction-proneness test was developed with the cooperation of the Ministry of Information and Communication and the Korea Agency for Digital Opportunity and Promotion. This scale can be used to screen for people who are prone to internet addiction. The scale has 40 items, which is scored from 1 to 4. Based on this test, the respondent can be classified as a high risk user, potential risk user or a normal user by using t -scores derived from total scores. Kim reported the reliability to be 0.96.⁷

Statistical analysis

Basic epidemiological data, including gender and age, were collected from all of the participants. Gender, amount of actual use time, place, and types of use were analyzed. Analysis was done using SPSS and the proportions of participants according to variables were compared using a chi-square test. A value of $p < 0.05$ was considered statistically significant. We compared the genres of the most preferred game according to the risk of internet addiction as evaluated by the Korean internet addiction test.

RESULTS

A total of 627 responses were analyzed after excluding three response papers which had missing values in essential parts of the questionnaire, such as internet addiction scales. There were some missing responses to questions in each response paper. The number of boys was 488 (77.8%) and girls 139 (22.2%) in a total of 627 respondents. There were 320 high school and 307 middle school students. The mean age was 15.91 ± 0.94 years. The mean age of boys was 15.84 ± 0.95 and that of girls was 16.18 ± 0.85 . There was no significant difference between

TABLE 1. COMPARISON OF SEX DISTRIBUTION WITHIN EACH INTERNET USER GROUP

	Boys	Girls	Total	χ^2	<i>p-value</i>
High-risk internet user	23 (4.7%)	2 (1.4%)	25 (4.0%)	3.593	0.166
Potential risk internet user	102 (20.9%)	26 (18.7%)	128 (20.4%)		
Normal user	363 (74.4%)	111 (79.9%)	474 (75.6%)		
Total	488 (100.0%)	139 (100.0%)	627 (100.0%)		

boys and girls in the distribution of each internet addiction risk group as measured by the Korean internet addiction test (Table 1).

The internet use time was compared using results from the Korean internet addiction test. Each user group showed significantly different internet and game use times. High-risk users used the internet ≥ 5 h during weekends. Risky internet users

also showed significantly longer game playing time. In the case of high-risk internet users, game playing time was longer than potential risk internet users during weekdays (high-risk internet users 3.02 ± 2.86 h, potential risk internet users 1.95 ± 2.12 h, $F = 17.24$, $p < 0.01$; Table 2).

Almost half of the adolescents (42.5%) played games in a place open to other people. However,

TABLE 2. COMPARISONS OF INTERNET USE TIME AND GAME PLAYING TIME BETWEEN THREE INTERNET USER GROUPS

		Number	Mean \pm standard deviation (hours)	F	<i>p-value</i>	Post-hoc tukey analysis
Daily internet use time (weekday)	High-risk internet user ^a	25	2.64 \pm 4.89	8.356	0.001	a:c /b:c
	Potential risk internet user ^b	127	2.03 \pm 1.60			
	Normal user ^c	465	1.50 \pm 1.47			
	Total	617	1.66 \pm 1.80			
Daily internet use time (weekend)	High-risk internet user ^a	24	5.06 \pm 9.73	12.061	0.001	a:c/b:c
	Potential risk internet user ^b	114	3.46 \pm 2.97			
	Normal user ^c	429	2.39 \pm 2.39			
	Total	567	2.72 \pm 3.22			
Daily game playing time (weekday)	High-risk internet user ^a	22	3.02 \pm 2.86	17.244	0.001	a:b/a:c/b:c
	Potential risk internet user ^b	115	1.95 \pm 2.12			
	Normal user ^c	430	1.26 \pm 1.45			
	Total	567	1.47 \pm 1.73			
Daily game playing time (weekend)	High-risk internet user ^a	22	4.55 \pm 4.22	13.259	0.001	a:c/b:c
	Potential risk internet user ^b	115	3.43 \pm 4.06			
	Normal user ^c	416	2.21 \pm 2.42			
	Total	553	2.56 \pm 2.98			

^aHigh-risk internet user; ^bPotential risk internet user; ^cNormal user.

The numbers differ because not all participants responded to every item on each questionnaire.

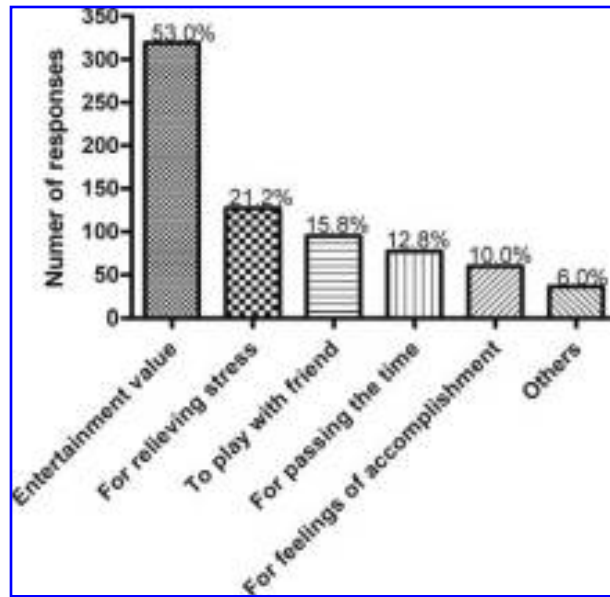


FIG. 1. Reasons for game play.

39.1% of respondents also stated they use games in their own private room. The rate of responses designate as others is high due to the development of mobile games. The primary reason for game playing was for fun (53.0%). The second most common responses were for relieving stress (21.1%). Other

responses included statements such as: “I want to show defiance to my parents,” and “I want to earn pocket money” (Fig. 1).

To determine internet dependence risk, three groups were compared using self-measured appropriateness of time spent for games in Table 3. Although the high-risk user group spent much time for internet and game play, their self-measuring rate of being appropriate (28.0%) was the highest among the responses. Most members of the potential risk user group (67.2%) self-measured as being excessive or feeling the need for time reduction. Even 34.3% of normal users responded that they needed to reduce the time spent for games.

The most preferred game genre was determined by selecting only one game genre. Simulation games were by far the most preferred (36.4%). Second was RPG (17.0%). The order of preference was simulation, RPG-action, web board, sports, shooting, community, and adventure (Fig. 2).

Each internet user group was compared according to the preferred game genre (Table 4). The most preferred game genre in all three groups was simulation. When selecting the most preferred three genres, the high-risk and normal internet user groups both showed the following preference order: simulation, RPG, and shooting games. The potential risk user group showed a similar preference order: simulation, RPG, and action. But in the

TABLE 3. SELF-MEASURES OF GAME TIME AND ACADEMIC ACHIEVEMENT IN EACH INTERNET USER GROUP

		<i>Classification of internet dependence risk</i>				χ^2	<i>p-value</i>
		<i>High risk user group</i>	<i>Potential risk user group</i>	<i>Normal user group</i>	<i>Total Number (%)</i>		
Self-measured appropriateness of time spent playing games	Appropriate	7 (28.0)	23 (18.4)	212 (45.7)	242 (39.4)	75.509	0.001
	Although not excessive, I feel a need for reducing time spent	6 (24.0)	41 (32.8)	159 (34.3)	206 (33.6)		
	Excessive	6 (24.0)	43 (34.4)	83 (17.9)	132 (21.5)		
	Although excessive, I can't seem to control the time	6 (24.0)	18 (14.4)	10 (2.2)	34 (5.5)		
	Total	25 (100.0)	125 (100.0)	464 (100.0)	614 (100.0)		

The numbers differ because not all participants responded to every item on each questionnaire.

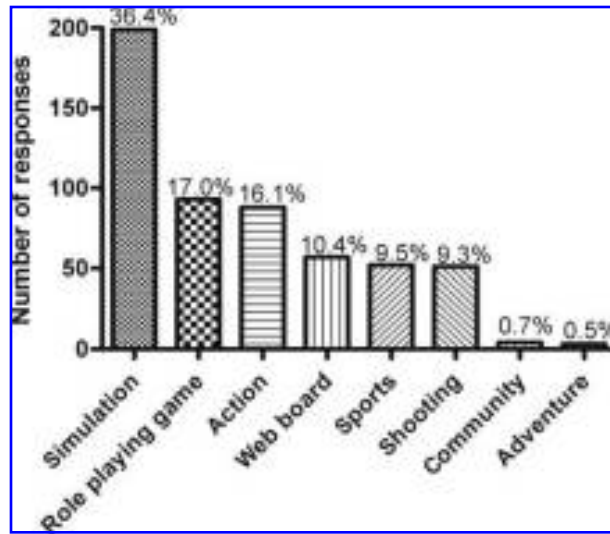


FIG. 2. Preferred game genres.

high-risk internet addiction group, the degree of preference differences between the first (simulation) and the second (RPG) was relatively small. RPG was relatively more preferred in this group, compared to the other two groups.

The gaming pattern was compared based on the most preferred game genre. Since the numbers of community and adventure game users were relatively small, they were excluded from the analysis. Web board game users liked playing with others less than other game users. The rate in web board game users was 44.6% but, in shooting game users, it was 88.0% and in RPG game users it was 77.5%.

Mean internet addiction scale scores of game users by genre were compared using the analysis of variance (ANOVA) test. The frequencies of game users were under 1.0% in community and adventure game, so they were excluded from the analysis. The results are presented in Table 5. There were

TABLE 4. MOST PREFERRED GAME GENRE AND PLAY PATTERN FOR EACH INTERNET USER GROUP

		<i>Classification of internet dependence risk</i>					
		<i>High-risk user (%)</i>	<i>Potential risk user (%)</i>	<i>Normal user (%)</i>			
Most preferred game genre	Simulation	6 (28.6)	49 (41.9)	144 (35.2)		199 (36.4)	
	Role playing game	5 (23.8)	24 (20.5)	64 (15.6)		93 (17.0)	
	Web board	2 (9.5)	10 (8.5)	45 (11.0)		57 (10.4)	
	Community			4 (1.0)		4 (0.7)	
	Action	3 (14.3)	19 (16.2)	66 (16.1)		88 (16.1)	
	Adventure	1 (4.8)		2 (0.5)		3 (0.5)	
	Shooting	4 (19.0)	9 (7.7)	38 (9.3)		51 (9.3)	
	Sports		6 (5.1)	46 (11.2)		52 (9.5)	
	Total	21 (100.0)	117 (100.0)	409 (100.0)		547 (100.0)	
		<i>Classification of internet dependence risk</i>					
		<i>High-risk user (%)</i>	<i>Potential risk user (%)</i>	<i>Normal user (%)</i>	<i>Total (%)</i>	χ^2	<i>p-value</i>
Preferred playing pattern	Prefer play by oneself	5 (20.0)	17 (14.4)	99 (22.2)	121 (20.5)	17.762	0.001
	Prefer play with others	18 (72.0)	95 (80.5)	273 (61.2)	386 (65.5)		
	No preference	2 (8.0)	6 (5.1)	74 (16.6)	82 (13.9)		
	Total	25 (100.0)	118 (100.0)	446 (100.0)	589 (100.0)		

The numbers differ because not all participants responded to every item on each questionnaire.

TABLE 5. GAMING PATTERN AND SELF-MEASURED LEVEL OF GAMING SKILLS FOR EACH GAME GENRE

Classification according to preferred game playing pattern	Most preferred game genre							χ ²	p-value
	Simulation ^a	Role playing game ^b	Web board ^c	Action ^d	Shooting ^e	Sports ^f	Total		
Prefer play by oneself	30 (15.4)	16 (18.0)	14 (25.0)	23 (26.7)	4 (8.0)	22 (44.0)	109 (20.7)	67.80	0.001
Prefer play with others	149 (76.4)	69 (77.5)	25 (44.6)	58 (67.4)	44 (88.0)	25 (50.0)	370 (70.3)		
No preference	16 (8.2)	4 (4.5)	17 (30.4)	5 (5.8)	2 (4.0)	3 (6.0)	47 (8.9)		
Total	195 (100.0)	89 (100.0)	56 (100.0)	86 (100.0)	50 (100.0)	50 (100.0)	526 (100.0)		
Total internet addiction scale score	70.16 ± 18.76	75.78 ± 19.25	66.25 ± 21.28	71.82 ± 18.86	74.61 ± 23.07	65.52 ± 15.50	F	3.14	Post-hoc Tukey analysis value b:c/b:f 0.008

^aSimulation; ^bRole playing game; ^cWeb board; ^dAction; ^eShooting; ^fSports. The numbers differ because not all participants responded to every item on each questionnaire.

significant differences in the means of the total internet score. Post hoc analysis showed that RPG game users had a significantly higher mean total internet addiction score than web board or sports gamers.

DISCUSSION

The distribution of adolescents in each internet addiction risk group is as follows: high-risk group, 4%; potential risk group, 20.4%; and, normal user group, 75.6%. These findings are similar to previous reports.^{6,7}

In our comparisons of internet use time and game playing time among the three groups, the problematic internet user group showed both longer internet use time and longer game playing time. As previously mentioned, game addiction and internet addiction can both be called technological addictions, a subset of behavioral addictions. Thus, these two types of addiction seem to have many characteristics in common.

Daily internet use time was increased during the weekend compared to weekdays, and this was also true of daily game playing time. This demonstrates that adolescents in Korea may use the internet or play games as a leisure activity. We need to understand that there is strong competition for higher academic achievement in middle school and high school-aged adolescents in Korea, and that Korean adolescents are lacking in leisure activities; thus, they find easy substitutes by using computers which can be easily enjoyed. This is also demonstrated in the answers given for the main reasons for game playing; 12.8% of responses indicated that game playing is used to alleviate tedium. It is not clear that if they had other options for leisure activities, there would be a similar prominent increase in internet use and game playing during weekends. Further studies on adolescents' perceptions about the internet and comparison of these perceptions with other adolescents who have different cultural and environmental backgrounds may be needed to confirm this finding.

Although they spent the most time for internet and game playing, the rate of self-measurement as being appropriate was 28.0% in the high-risk user group. This rate was higher than potential risk user group. This suggests that they have higher tendency not to recognize the degree of severity of this kind of addiction, when compared with potential risk user group; 24% of the high-risk group also reported that they have difficulty in controlling the amount of game use. This response rate was also higher than that of the other two groups. In a previ-

ous report, it was noted that the higher the tendency of one being addicted to the internet, the less faith that person has in his or her control over their own life.⁸ High-risk internet users seem to have difficulty with control of their own behavior, and this could be related to low self-confidence and emotional problems.⁸

When the most preferred game genre was investigated based on the results from the internet addiction scale, the order of the most preferred game genres was similar in the three groups. But the gap between the most preferred game genre, simulation games, and the second one, RPG, was relatively small in the high-risk internet user. With the potential risk and normal internet users, the rate of simulation game use was more than twice that of RPG use. However, the difference in the high-risk internet user group was only 4.8%. This suggests that RPG games are more preferred by high-risk internet users and that RPG have more possibilities for being addictive.

The most preferred game playing pattern was that of playing with others. This was prominent among all of the three internet user groups. Adolescents in Korea use games for playing with others, and games are commonly used as leisure activities that can be enjoyed with others. Games are also frequently a common subject in conversation, especially in the case of male students.^{4,9} This might be due to two reasons. The first might be the lack in Korea of other enjoyable leisure activities with others, and the second one could be the characteristics of the game itself. For success in the more complex games (especially RPG, including MMORPG), social interaction is highly essential and players must collaborate with others in the game. Games are also used for social connections.^{10,11}

When we divide game users according to their most preferred game genre, and try to find out their distribution according to game play patterns, there were significant play pattern differences in each type of game genre. Simulation, RPG, and shooting game users showed a preference for playing with others. In the case of web board games and sports games, the preference for playing with others was lower than among other genre users. This could be partially explained by the characteristics of games. For mastering game skills, many efforts are needed in the case of simulation, RPG, and shooting games. But web board games and sports games are easily played the first time, although repetition is required to achieve higher scores or levels in these genres. These game characteristics are also shown in the internet addiction scale scores of game users in each genre. RPG users

scored the highest mean total internet addiction scale scores. On the other hand, web board and sports game users showed lower internet addiction scale scores than players in other genres.

We suggest that users of some game genres might have their own psychological potentials related with addictions that differentiate them from users of other genre, and that this also may have an influence on game selection but also on general internet use. In our study, RPG games have been shown to have a greater possibility of leading to technological addictions to game and the internet, when compared to web board and sports games.

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