Internet Over-Users' Psychological Profiles: A Behavior Sampling Analysis on Internet Addiction

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ABSTRACT

What kinds of psychological features do people have when they are overly involved in usage of the internet? Internet users in Korea were investigated in terms of internet over-use and related psychological profiles by the level of internet use. We used a modified Young's Internet Addiction Scale, and 13,588 users (7,878 males, 5,710 females), out of 20 million from a major portal site in Korea, participated in this study. Among the sample, 3.5% had been diagnosed as internet addicts (IA), while 18.4% of them were classified as possible internet addicts (PA). The Internet Addiction Scale showed a strong relationship with dysfunctional social behaviors. More IA tried to escape from reality than PA and Non-addicts (NA). When they got stressed out by work or were just depressed, IA showed a high tendency to access the internet. The IA group also reported the highest degree of loneliness, depressed mood, and compulsivity compared to the other groups. The IA group seemed to be more vulnerable to interpersonal dangers than others, showing an unusually close feeling for strangers. Further study is needed to investigate the direct relationship between psychological well-being and internet dependency.

INTRODUCTION

INTERNET USE in Korea has increased dramatically and has become a major part of daily life. According to recent statistics, 61% of men and 49.1% of women are using the internet, out of 47 million in the general population. More than 30% of households are registered for super high-speed internet services (ADSL), and internet access time is much longer for each household than in the United States or other Western countries. This rate of internet access is about two times greater than that in Canada and four times greater than that in Japan (Korea National Statistics, 2002).

However, the Korean public is apprehensive about pathological use of the internet, which results in negative life consequences such as job loss, marriage breakdown, financial debt, and academic failure. Excessive online game usage, especially, has emerged as a major social concern, because of the social and family conflicts related to game activities. About 70% of internet users in Korea are reported to play online games. Use is higher among adolescents, with 69% percent of teenagers playing computer games *more than 2 h every day* and about 18% of teenagers who play computer games being diagnosed as game addicts.[11]

The definition of and diagnostic criteria for internet addiction are of recent interest to many psychologists, especially in order to identify pathological internet use and its consequences. Efforts to explain why and how people are deeply involved in the internet become urgent research issues. Young has developed an eight-item scale to diagnose internet addiction, which is adapted from the diagnostic criteria of pathological gambling in the

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DSM-IV.[16,17] Different from other bona fide addictions (e.g., alcohol, heroin addiction), internet addiction can be defined as an impulse-control disorder with no involvement of an intoxicant; therefore, it is akin to pathological gambling. In addition, Young also created a 20-item questionnaire based on the criteria for both compulsive gambling and alcoholics.

Although Young's scale is a stepping-stone for identifying problematic behaviors related to Internet use, her study did not address psychological profiles of internet over-users and their behavioral consequences. Her study could not provide a general picture of internet addiction because of the shortcomings of the research samples. Using a convenient sampling method, she recruited participants from college students and internet addiction support groups. As those participants seemed to be aware of internet addiction, it was not surprising that 396 participants were identified as internet dependent (and 100 participants were identified as nondependents) out of the total 596 participants.[17] The degree of addiction was estimated, including the internet addicts (IA), the possible addicts (PA), and the non-addicts (NA). Young and other researchers, based on her initial study, estimate that 5–10% of the total population, as many as 10 million people, may be regarded as internet addicts in the United States.[17,18]

In spite of increased attention to internet addiction, no comprehensive research focusing on internet over-users and their psychological consequences has been conducted in Korea. A linear relationship between Internet usage and people's psychological well-being has been repeatedly proposed.[9,10,12,13] Young also consistently argued a significant positive relationship between depression and internet dependence.[18] In the present study, we have attempted to examine Internet-using behaviors and their psychological implications, particularly among Koreans.

MATERIALS AND METHODS

Participants

This research was conducted by an online survey over one of the most popular portal sites in Korea, called "Daum.net." The registered members of the site number more than 26 million, and visitors to the site number more than 28 million daily. Not only because of the size but also because of the nature of the site, the visitors of this site are a representative population of the Korean internet users.

The participants were recruited by a banner advertisement, which was posted for about 4 days. Participants in the research had clicked on the banner and then consented to join the research. The responses of each participant were collected through the linked survey site, and responses were automatically recorded.

The total number of participants was 14,111, composed of 8,171 males (57.9%) and 5,937 females (42.1%). However, those who failed to complete the questionnaire were excluded from the analyses, so that the final number was 7,878 males (58%) and 5,710 females (42%). The mean age was 26.74 (SD = 7.27) years. Most of the participants fell in the 20–40 age range (79.7%). There were 14.6% teens, 4.7% in their forties, and 1.0% in their fifties. Occupations were as follows: 46% students, 40.8% full-time employees, 6.6% housewives, and 6.6% non-employees. No other demographic variables such as ethnicity, socioeconomic class, or residence were considered in this study.

Procedure

An advertisement for research participation was posted to the Daum site (www.daum.net) for 1 week. As a reward, the participant was eligible for a prize when he or she completed the survey. As the survey was conducted at one of the most popular and largest internet portal sites, the participants could be regarded as a representative sample of internet users in Korea. After 1 week, we disconnected the link. We then examined group differences in internet use behaviors (e.g., hours spent, services most used on the internet), and measures of psychological well-being (e.g., loneliness, depressive moods, and compulsiveness).

Instruments

We used the "Survey on Internet Use," which was composed of four sections: demographic information, the pattern of internet use, the degree of internet dependence, and psychological well-being.[10] The demographic information collected was age, sex, educational level, occupation, income, and residential province.

Internet use. The section of the survey on patterns of Internet use asked about (1) the overall amount of time spent on the Internet per day, (2) the three most used services and time spent on each service, (3) the frequency of checking e-mails per day, (4) the number of online communities that participants may be actively involved in, (5) the place

where participants generally connect to the Internet, (6) the content and disruptive consequences due to Internet use, and (7) the negative feedback from significant others. These questions explored typical internet activities and their duration.

Internet dependency. In order to measure the degree of internet dependency, we asked how users manage their daily life and express it. Six different situations were employed to evaluate internet dependency in everyday life, including the situation of getting (1) home, (2) bored, (3) stressed by work, (4) stressed by significant others, (5) lonely, and (6) depressed. The Internet Addiction Scale was modified from Young's study.[16] However, we had to recalibrate the original five-point scale into a four-point scale, anchored by "1 = Strongly disagree" and "4 = Strongly agree," in order to avoid the neutral response tendency among Koreans. The total score was in the range of 20–80 (M = 40.7, SD = 11.7). A higher score implies a tendency toward addictive usage. The internal consistency of our modified Korean version of Young's scale was 0.90 (Cronbach's alpha).

Psychological well-being. Addictive behavior has been explored in relationship with psychological problems. In this study, we investigated a possible link between internet addiction and the psychological well-being of internet users. Our psychological well-being scale was adapted from "*The Diagnostic Scale of Excessive Internet Use*" administered in the Korean Youth Counseling Institute (www.kyci.or.kr). The scale was developed and validated as a part of an on-line psychological test for Korean youth in 2001. The original scale consisted of 142 items, but the 44 items measuring a person's psychological well-being as correlated with internet use were selected for the present study. These items were rated on a four-point Likert scale anchored by "1 = strongly disagree" and "4 = strongly agree." The 44 items were reduced by the principal component analysis of the items. Three factors were selected, based on moderate correlation cutoff ($r = 0.30$).[13a] Fourteen items were correlated with factor 1, nine items were correlated with factor 2, and 10 items were correlated with factor 3, which were labeled as loneliness, depressive mood, and compulsiveness, respectively. The number of items per factor was dependent on obtaining adequate internal item consistency, as calculated by coefficient alpha (Loneliness, alpha = 0.85; Depressive mood, alpha = 0.70; compulsiveness, 0.80). The internal consistency (Cronbach's alpha) was 0.92.

RESULTS

Diagnostic criteria and ratio of addicted people

Three types of internet user groups were identified, in accordance with Young's original scheme: Internet Addicts (IA), Possibly Internet Addicts (PA), and Non-Addicts (NA). In this study, the IA group was defined as those who had a score higher than 60; they agreed to all 20 questions, responding 3 or 4 on the four-point scale. In a similar manner, those who scored between 50 and 60, were classified as PA; on a four-point scale, a rating of 2 indicates mild disagreement with the question, while a rating of 3 indicates mild agreement with the question. Thus, a mid-point from the neutral to positive extreme was counted as 2.5, so that the PA group was classified as 50–60 points. The cutoff for the NA group was below 40; those in the NA group disagreed with most criteria propositions. People in the NA group would not show any disturbances in their daily lives due to internet use.
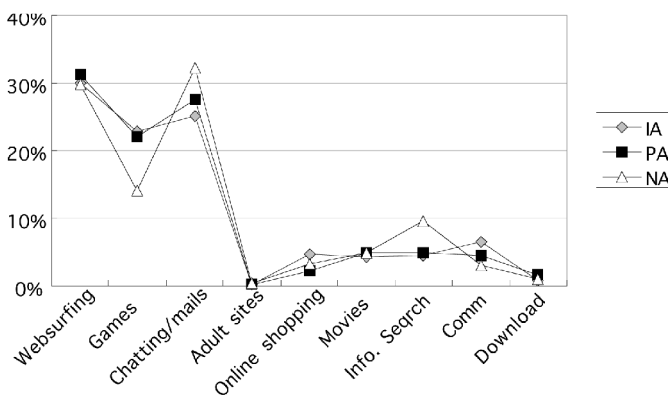

FIG. 1. Most frequently using Internet services among three groups: IA: Internet addicts; PA: Possible Internet addicts; NA: Non-addicts.

The proportion of three groups was identified as following; the addicted group (IA) was 3.47% (male, 57.96%; female, 41.04%; mean, 63.51; SD, 3.84), the possible addicts (PA) were 21.67% (males, 56.06%; females, 43.94%; mean, 47.35; SD, 1.69). The proportion of non-addicts (NA) was 43.11% (males, 58.41%; females, 41.59%; mean, 33.43; SD, 4.98) of the present sample. The respondents with scores between 40 and 49 were excluded (31.8%) from this analysis because they did not fall into the three defined groups. These results were consistent with Young's estimate of 5–10% internet addiction in the United States, which implies an addiction rate in Korea quite similar to that found by previous researches.

Internet usage patterns

Internet services were not the same for all internet users. The three groups showed distinctive usage patterns. For those who were classified as IA, online games, online shopping, or online community activities were much higher than those of the other two groups. By contrast, NA reported a higher rate of using e-mail or chatting, and doing information searches than did IA and PA (Fig. 1). These results were congruent with Young's findings that Internet addicts tended to engage in interactive services, in order to compensate for their lack of interpersonal interaction in reality.[19]

Internet dependency

The degree of dependence on the internet was analyzed based on the participant's daily activities in six different life situations (e.g., getting home, bored, stressed by work, stressed by people, getting depressed, and sad). In each possible life situation, people had to choose the most probable behavior they would engage in.

Stressed. Both IA and PA (more than NA) reported internet use when they were stressed by people (IA, 21.2%; PA, 14.3%; NA, 8.6%). Internet use by the IA group was above two times greater than that of the NA group. On the contrary, more NA reported that they met people than did IA and PA (NA, 6.2%; PA, 5.2%; IA, 2.8%; Fig. 2).

When they get stressed by work, the IA group showed greatest internet use among the three groups. The rate of internet use for the IA group was about four times greater than for the NA group (IA, 20.4%; PA, 16.6%; NA, 5.0%). An interesting fact was that NA reported higher rates of drinking than did the other groups in the same situation (NA, 18.8%; PA, 16%; IA, 14.2%; Fig. 3). In sum, it might be safe to assume that people used different behavior repertoires in stressful situations depending on their levels of internet addiction.

Sadness. Consistent with previous findings, internet use was the most common behavior when participants were sad, with no group differences. Again, more IA reported a higher rate of internet use than PA and about four times greater than that of NA (IA, 23.4%; PA, 18.7%; NA, 5.6%). Though the portion was small, interestingly, the rate of meeting other people among NA was about double that of IA (NA, 9.4%; PA, 5.5%; IA, 4.2%; Fig. 4).

Depressed. In analyses of typical activities used when people get down or depressed, IA reported the highest rate of internet use among the three groups, and it was more than double that of NA (NA, 52%; PA, 40.7%; IA, 20.4%). By contrast, NA reported a higher rate of watching TV or videos than PA and IA (NA, 11.3%; PA, 9.2%; IA, 6.6%). These results support the assumption that IA would feel more comfortable with the computer and the internet than the other groups (Fig. 5).
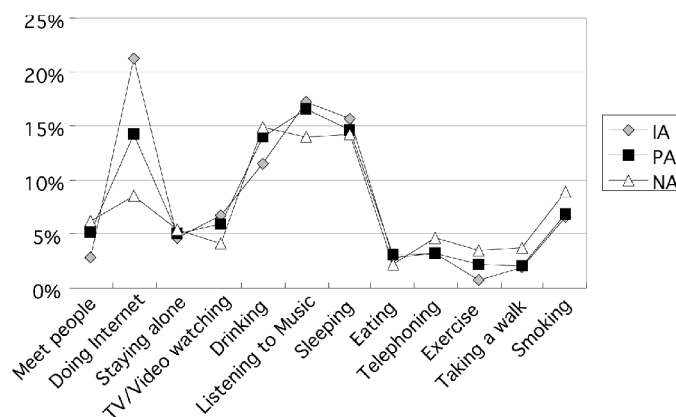

FIG. 2. In stressed situation, the probable behavior repertoires by the Internet addicts (IA); Possible Internet addicts (PA) and Non-addicts (NA)
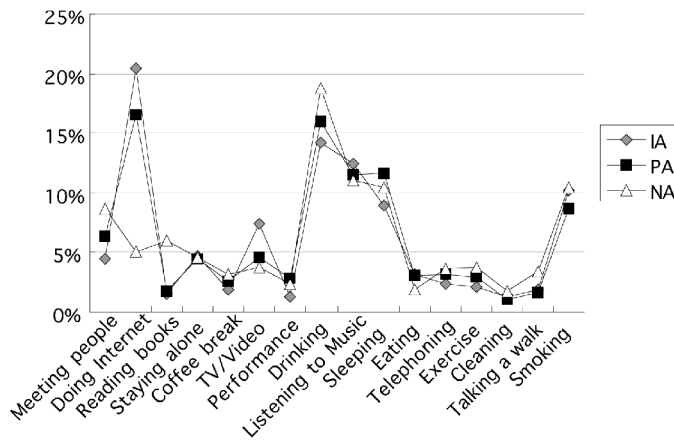
FIG. 3. In a work related stress situation, the probable behavior repertoires by the Internet addicts (IA); Possible Internet addicts (PA) and Non-addicts (NA)
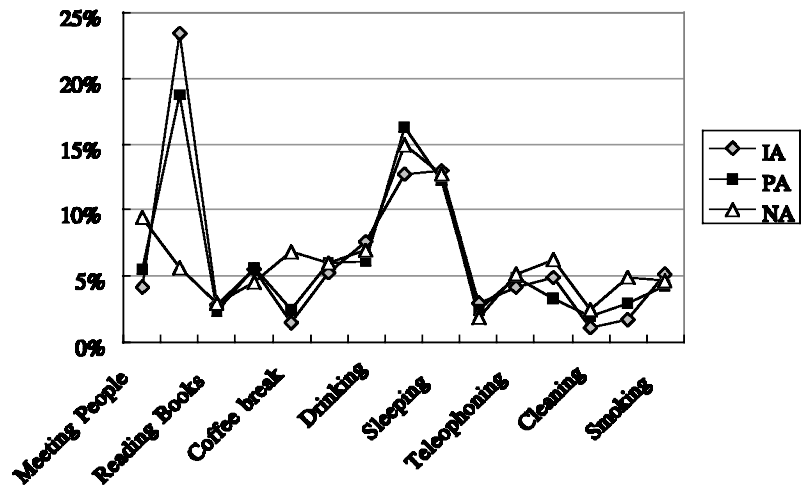

FIG. 4. In a sad situation, the probable behavior repertoires by the Internet addicts (IA); Possible Internet addicts (PA) and Non-addicts (NA).
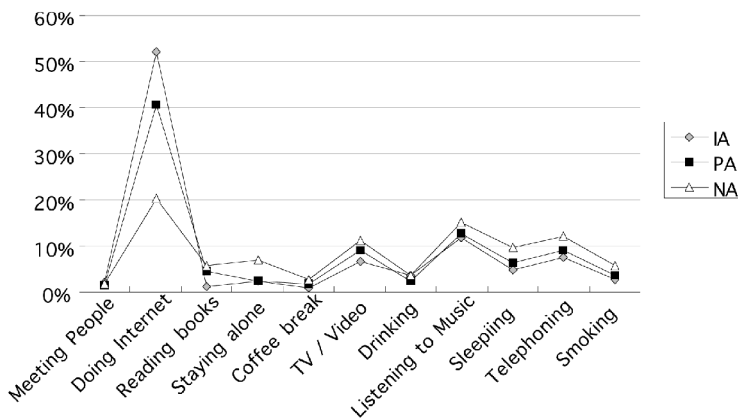

FIG. 5. In a depressed situation, the probable behavior repertoires by the Internet addicts (IA); Possible Internet addicts (PA) and Non-addicts (NA).

First act. In the analysis of a person's first act upon returning home, a significant difference was found between IA and NA. IA reported the highest rate of turning on the computer, which was about 15% higher than PA and about three times higher than NA (IA, 76.9%; PA, 59.2%; NA, 26%). The NA, by contrast, reported a higher rate of watching and turning on the TV or stereo than PA and IA (Fig. 4). In sum, NA appeared to depend more on the TV than on the computer in comparison with IA and PA, while IA seemed to depend more on the computer than any other resources in comparison with PA and NA (Fig. 6).

Psychological well-being

Indices of psychological well-being were measured by three factors: loneliness (14 items),
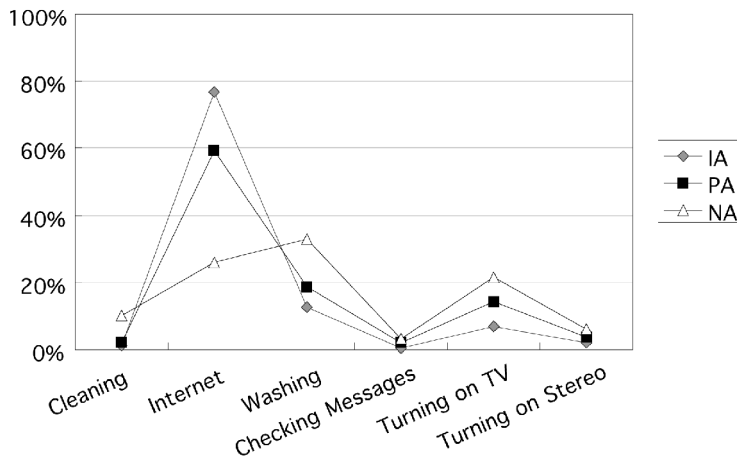
FIG. 6. The most probable behavior repertoires when they got home by the Internet addicts (IA); Possible Internet addicts (PA) and Non-addicts (NA).

depressive moods (nine items), and compulsiveness (10 items) (Fig. 7).

Loneliness. One-way ANOVA revealed a significant group difference in the loneliness score ($F_{2,8253} = 1304.17$, $p < 0.001$). Post-hoc analyses revealed significant group differences among these three groups. Not surprisingly, IA reported the highest degree of loneliness, followed by PA and NA.

Depressive moods. Similar to the analyses above, one-way ANOVA revealed a significant group difference in depressive moods ($F_{2,8253} = 1183.32$, $p < 0.001$). Also, the post-hoc analyses revealed significant group differences among these three groups. Again, IA reported the highest degree of depressive moods, followed by NA and PA. Surprisingly, NA reported a higher degree of depressive moods than PA.

Compulsiveness. One-way ANOVA revealed a significant group difference in the compulsiveness

score ($F_{2,8253} = 785.00$, $p < 0.001$). Also, in the post-hoc analyses of compulsiveness, IA reported the highest score among these three groups. And NA, again, reported a higher degree of compulsiveness than PA.

Overall, results have supported previous findings of a high relationship between the level of internet addiction and psychological states such as loneliness, depressive mood, and compulsiveness. The IA group has shown high levels of loneliness, depression, and compulsiveness, while the NA group showed relatively low levels of loneliness, depression, and compulsiveness, meaning that they are in better condition in terms of psychological well-being.

DISCUSSION

In this study, we have examined internet use patterns and internet addiction–related psychological profiles among Koreans. The level of internet ad-
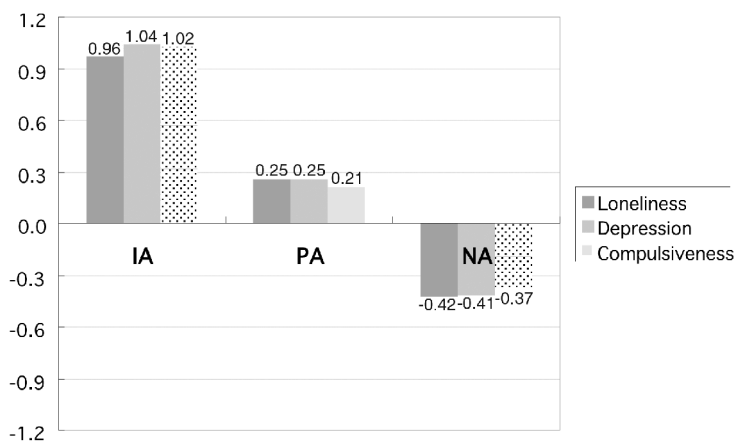

FIG. 7. The standardized score of psychological well-being among three groups: IA: Internet addicts; PA: Possible Internet addicts; NA: Non-addicts.

diction in Korea was not different from that found in previous research, which was conducted using Young's diagnostic criteria for internet addiction. Compared to a marginal proportion of internet addicts (i.e., 3.47% of the participants), we could identify a relatively high proportion of PA (possible addicts), 21.67% of the sample. The PA group has shown a pattern of internet usage quite similar to that of the IA group. In addition, the internet dependency of the PA group was well expressed in life-related situations such as stressed, sadness, depressed, and first act. To set up a procedure for identification and intervention for this new type of maladaptive behavior, the exploration of the PA group could provide great insight into the process of developing an internet addiction.

High dependency on the internet of the IA group was associated with interpersonal difficulties and stress in reality. As for the reason they played on-line games, more IA than PA and NA responded that they hoped to avoid reality. The IA group seemed to have created new social relationships, which was expressed in a high proportion of online chatting to make new friends. They also showed a strong tendency to reveal personal concerns or to meet on-line acquaintances offline. These behavior patterns were quite similar to those of lonely people in real life—that is, those who feel close to and spend more time in shallow relationships with strangers than with family and friends.[8] As a consequence of such dysfunctional social behaviors, lonely people would feel lonelier, because their need to belong is insufficiently met.[2]

Though the present study did not imply directionality, a reciprocal relationship of internet use and negative psychological well-being is proposed. IA would feel interpersonal relationships in reality are stressful, so that they try to shun others and engage in internet use as an alternative. It is also reasonable to assume that they spend more time on the Internet, and they would have less chance to interact with other individuals in person and, consequently, experience an increased sense of loneliness and depressive moods.

It is still controversial, however, to propose this relationship between psychological well-being and internet dependency. According to Kraut et al.,[9] using the internet leads to significant increases in loneliness and depression. On the contrary, McKenna and Bargh found that the average reported level of depression for participants after 2 years of using on the internet was less than it had been before using the internet.[12] They also found the same pattern in the level of loneliness. Therefore, further study is needed to investigate the di-

rect relationship between psychological well-being and Internet dependency.

One limitation of the present study was the representation of the population. As the data was collected by online survey, the participants of the study had easy access to the internet or were engaged in internet-related work. Therefore, caution should be taken when applying these results to a different population.

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