PRECURSORS OF THE INTERNET ADDICTION AMONG ADULTS? THE IMPACT OF SELF-CONCEPT, STRESS AND INTERNET USAGE CONTROL ON THE INTERNET

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ABSTRACT

This research identifies what are the socio-psychological variables influencing adults' Internet usage which has negative social and psychological impacts on them. That is, self concept(self-esteem, self-control, and self-efficacy in cyberspace), stress levels, and the Internet usage control have direct and moderate impacts on the Internet addiction.
This research shows that the lower one's self-esteem and self control are, the more likely he/she is addicted to the Internet. Among Internet addicts, the chance of finding people with higher self-efficacy in cyberspace, under higher level of stress, or under higher level the Internet usage control increases than non-addicts. We also analyze the moderating effect of the Internet usage control by identifying what differences may arise when self-concept and stress influences the Internet addiction, depending upon the degree of the Internet usage control in each high or low Internet usage control group. The moderating effect of Internet usage control between self-concept, stress level and Internet addition is significant.

KEYWORDS: Self-Esteem, Self-Control, Self-Efficacy in Cyberspace, Stress, Internet Usage control, Internet Addiction

INTRODUCTION

The Internet provides many positive aspects to users as it allows them to obtain new information, knowledge, and even entertainment. However, the Internet brings many problems. The increasing number of cases of people being overly engrossed in the Internet, becoming addicted, and harm themselves and their families, has become cause for social attention.

The conducted survey on Internet use and addiction identifies what influences various socio-psychological variable factors related with adults' Internet use, namely, variables such as self-concept (self-esteem, self-control and self-efficacy in the cyberspace), stress, and Internet usage control, have on Internet addiction. It shows that Internet usage control that individuals actually feel plays crucial roles in the relationship between the self-concept and Internet addiction, and practically determines moderating roles of Internet usage control in order to present information and materials that help understand the public in cyberspace, to enable people around addicts and government systems to set up basic directions, and to offer basic materials needed to organize programs to prevent addictive use of the Internet.

This paper's major objectives are not only to identify direct effects of variables that determine Internet addiction such as self-concept, stress, and Internet usage control but also to address the nature of impact (the moderating effect) of Internet usage control which exists between self-concept and Internet addiction.

THEORETICAL BACKGROUNDS

Internet Addiction

Shaffer (1999) presents three characteristics to determine an Internet addict:
- Behavior motivated by feelings accompanying mild to overwhelming cravings for compulsion. A compulsive behavior is a behavioral pattern with strong repetition;
- Strong involvement in drug activity or behaviors despite negative social, psychological, and biological outcomes;
- Subjective sense that one can no longer control his behavior.

In general, addiction is viewed in association with substances like drug and alcohol. However, this study aims to address Internet addiction in terms of behavioral aspects other than those related to substances. Materials or technologies related with addiction can affect the occurrence of addiction, but they don't lead to addiction in their own right. That is, addiction diagnosis depends not on the use of objects that may cause addiction, but on negative behavioral outcomes such as tolerance or withdrawal syndromes that can be found in some users. Thus, to understand the phenomenon of addiction, it is necessary to identify the characteristics of objects that could cause addiction and to analyze the propensities of those who show negative outcomes in using the Internet.

Goldberg and other researchers define the Internet addiction as follows.

According to Goldberg, he put forward the term of Internet addiction disorder characterized by 'tolerance' of the satisfaction one feels from constant use of the Internet, 'withdrawal' when one experiences psychomotor anxiety and impatience, or the compulsive drive or illusion (daydreaming) on the Internet when one stops or decreases Internet use, and damage to major social ·occupational activities due to Internet overuse. Griffiths (1995) defined Internet addiction as a non-chemical addiction originating from interactions between human and machines, and added that technological addiction is either passive (e.g. television) or active (e.g. computer games), prompting and reinforcing the characteristics facilitating addictive tendencies. Young (1996a) also defined Internet addiction as an impulse control disorder that does not entail an intoxicant. Lastly, by the term pathological Internet use, Davis referred to psychopathic disorders including pathological behaviors and maladaptive cognition. Internet addiction applies not only to cases of using the Internet excessively.

There are positive aspects of Internet use such as being engaged in Internet-related work or using the Internet for long periods of time for the purpose of doing research. Thus, there can be problems with the categorization of regarding all cases of computer or Internet overuse as Internet addiction (Young, 1996a, 1999). In this sense, Internet addiction refers to the state where an individual loses control and suffers serious negative effects such as tolerance and withdrawal symptoms in real life.

This article adopts Young's criteria. The *diagnostic and Statistical Manual of Mental Disorders (*DSM) is an internationally utilized standardized reference manual which includes the American Psychiatric Association's designated criteria for the identification, classification, and treatment protocol for mental illness. Kimberley S. Young, who has done full-scale studies on Internet addiction, modified standards for pathological gambling in DSM-IV in 1996, and conducted a telephone survey for the sake of studies on pathological Internet use. According to Young's criteria, scores of 50 points or less are considered light addiction cases, and those scoring 80 or more points are considered serious cases. Most previous studies have found that the rate of serious addiction reaching a critically pathological level is very small. Indeed, most cases are found to be light addictions, at the engrossment level.

Self-Concept in Cyberspace

It is necessary to identify whether Internet addiction is a psychological pathology or if it is associated with confusion in self-integration or ego-identity.

As far as drug addiction, which has the most similar diagnosis standards with Internet addiction, the addiction has a much deeper relationship with self-integration factors than with pathological factors (Lettieri, 1975), and psychological characteristics which drug abusers show such as depression, anxiety, lack of control, and lack of self-esteem are considered consequences of identity confusion at the stage of 'pursuing self.' Along with this view, the reasons why Internet addiction is explained with 'self' factors instead of pathological factors are as follows: First, many people use the Internet, but not everyone becomes addicted to it (Gye-Won Lee, 2000). Second, Internet addiction is problematic not because of the negative implications of its stimuli, but because of the difficulties in controlling the impetus (Young, 1999). Third, by becoming skilled at the Internet including games, users become engrossed until they reach self-efficacy (Won-Young Lee, 1999). Fourth, users try to appear better than they actually do both to others and themselves through the Internet (Gye-Won Lee, 2000). Fifth, considering Suler's study (1996) in relations with Maslow's desire structure, users may or may not become addicted, rather going though the inner control process of the concept of self.

This article concentrated on 'self-concept,' as an individual factor that determines Internet addiction by exploring three aspects of self-concept: self-esteem, self control, and self-efficacy in cyberspace by Gye-Won Lee (2000).

Self-Esteem. Self-esteem is a feeling in that an individual thinks of himself as competent, important, successful, and valuable (Coopersmith, 1981). In other words, high self-esteem, as a subjective evaluation, means that a person with high self-esteem accepts, respects, and likes himself, and feels his person valuable (Rosenberg, 1985). Self-esteem is a value one confers upon oneself and is related with the level of success one can expect from his own behavior. People with high self-esteem are able to withstand negative evaluations from others and make independent evaluations of themselves (Watson, 1979). They can also cope with comeuppances appropriately and effectively, think of them as valuable and important, and are able to perform their roles actively, aggressively, and creatively with confidence (Coopersmiths, 1981). On the other hand, those with low self-esteem have negative points of view, are not confident about their own thoughts, and have low expectations of positive results in the future (Brown, 1987).

Self-Control. Self-control means that one can control their awareness, emotions, and behaviors as they want, but the definitions vary according to scholars. Logue (1995) defined self-control as a situation of choice, which refers to 'choosing a much bigger outcome, though delayed longer than the smaller outcomes without delays,' and presented an opposing concept of impulse, where one would choose smaller outcomes not delayed rather than bigger outcomes delayed. Failure in self-control brings about several negative outcomes; specifically it is likely to be in the form of impulse control disorder or addiction.

Self-Efficacy in Cyberspace. Self-efficacy is the judgment of an individual's ability to organize and perform behaviors necessary to achieve certain outcomes (Bandura, 1986). Self-efficacy of computer use was primarily low because computers made people feel uncomfortable in the early age of computers. Nowadays, however, Internet use has increased tremendously as society encourages Internet use and computers can be found in almost every household. Won-Young Song (1998), who has studied addictive Internet use and interpersonal self-efficacy, found that the lower interpersonal self-efficacy is in reality, the greater the tendency of addictive Internet use individuals have, by analyzing that those lacking efficacy in direct face-to-face relationships resort to cyberspace as an outlet to forget about their insufficient interpersonal relationships in reality.

Stress

Lazarus and Folkman (1984) define stress as a specific relationship between an individual and environment in which his security is threatened beyond their limit. Holahan, et al. (1984) revealed that daily stress has greater explanatory power in predicting an individual's adjustment, such as starting to recognize minor problems perceived in daily life as stress. Daily stress may not be serious in itself, but it is noteworthy that accumulation of stress causes significant maladjustment and works as a threatening factor (Kanner, Coyne, Schaefer & Lazarus, 1981). Seung-Yeon Seo's study (2001) indicated that in cases where online games are mainly used, daily stress is a major variable affecting addictive Internet use, and that groups with high stress levels easily become engrossed in addictive Internet use when lacking functional support.

Internet Usage Control

Young-Soon Park (2002) also suggested that student groups with time restrictions on their Internet use spend less time on the Internet than those without, which indicated

that parents' control is related with students' time spent on the Internet. The Commission on Youth Protection (2003) reported that the more time management parents do for their children, the lower the possibility their children will become addicted. Given that parents' control is an important factor in lessening the likelihood of their children's Internet addiction, it can be said that control of those people around an addict including parents, spouse, teachers, colleagues, friends, or supervisors at work can serve as a major factor in reducing Internet addiction. Furthermore, it is also possible that Internet usage control (Wang-Bae. K. and Kyung-Yong. L.) in major arenas like workplace, home, and school (monitoring by CCTV, monitoring of e-mail, monitoring of Internet use, installation of Internet monitoring software and its active use, and establishment of regulations and systems on software available) can work to decrease Internet addiction. However, few studies have addressed the relationship between Internet addiction and Internet usage control by the potential addict's peers or by systems or rules in real life.

RESEARCH MODEL

<u>Direct Effect Study Model</u>

To identify the direct effects of each independent variable (Internet usage control, self-esteem, self-control, self-efficacy in cyberspace, and stress) on each one's respective subordinate variable (Internet addiction), the model in Figure 1 is tested.
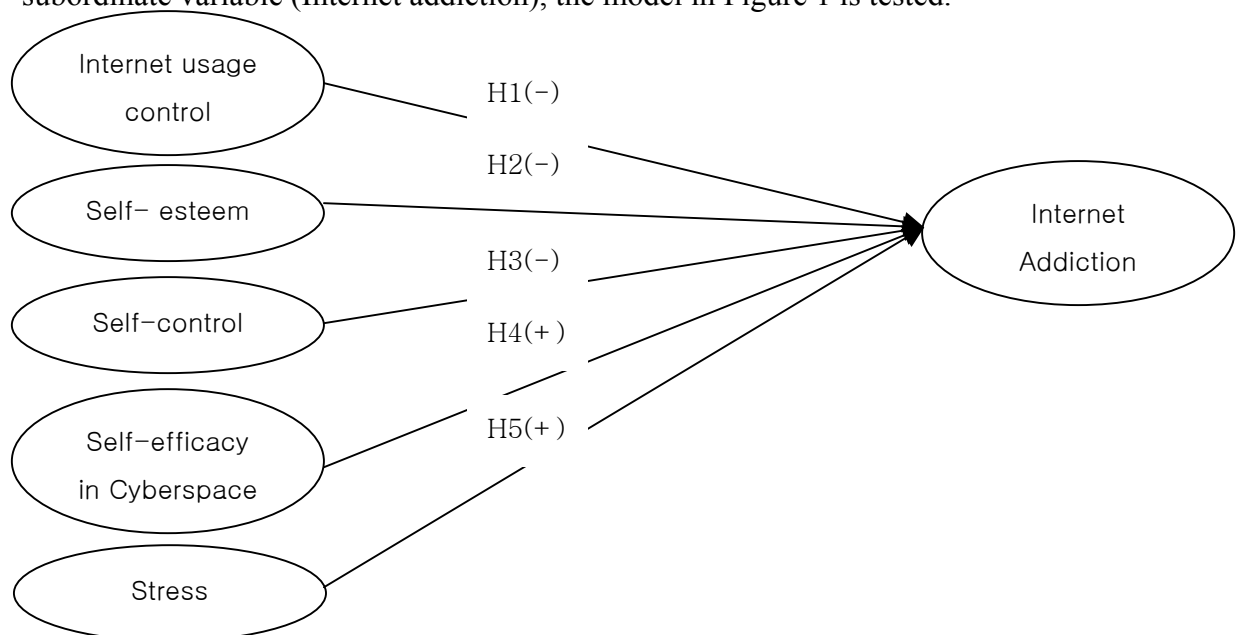

Figure 1. Direct Effect Research Model of Variables

Hypothesis 1. Those with high Internet usage control are less likely to become addicted to being in cyberspace than those with low control.

This article adopts the term, Internet usage control, as a control or set of restrictions enforced by the Internet user's peers to prevent him from using the Internet, and supposes that those in groups with strict Internet usage control are less likely to find themselves engrossed in cyberspace than those in groups with low control.

Hypothesis 2. Those with high self-esteem are less likely to become addicted to the Internet than those with low self-esteem.

This article adopts the concept of self-esteem as satisfaction with oneself, and presumes that those with high self-esteem are less engrossed in cyberspace than those with low self-esteem.

Hypothesis 3. Those with high self-control are less likely to get engrossed in cyberspace than those with low self-control.

This article adopts the concept of self-control as being able to control one's own awareness, emotions, and behaviors, and predicts that people with high levels of self-control are less engrossed in cyberspace than those with low self-control.

Hypothesis 4. Those with high self-efficacy in cyberspace are more apt to be addicted to being online than those with low self-efficacy.

This article supposes an activity in cyberspace as a human behavior, and recognizes as self-efficacy participation and engrossment in such an activity, namely, a judgment of how valued one is in cyberspace and the belief that use of cyberspace will offer enough positive reinforcement, with the prediction that, the higher one's self-efficacy in cyberspace is, the more they will become engrossed in cyberspace.

Hypothesis 5. Those under a lot of stress are more likely to become obsessed with the Internet to avoid or release stress.

This article regards common tension or minor troubles experienced in daily life as daily stress, and predict that for those under such stress, attempts to avoid or release stress are major factors leading them to Internet.

Moderating Effect

To identify moderating effects attempts to find out if self-esteem, self-control, self-

efficacy in cyberspace, and stress control the extent of falling into addiction according to high or low Internet usage control, the model in figure 2 is tested.
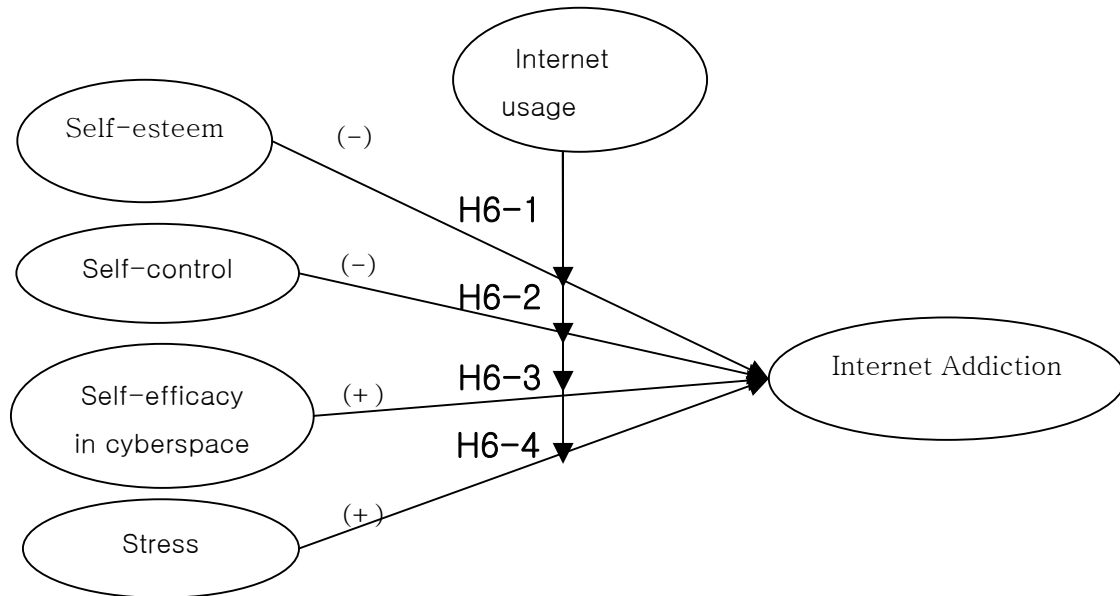

Figure 2. Moderating effect Research Model of Variables

Hypothesis 6. Internet usage control serves as a moderator between self-concept and Internet addiction

    6-1. Internet usage control serves as a moderator between self-esteem and Internet addiction.

    6-2. Internet usage control serves as a moderator between self-control and Internet addiction.

    6-3. Internet usage control serves as a moderator between self-efficacy in cyberspace and Internet addiction.

    6-4. Internet usage control serves as a moderator between stress and Internet addiction.

This article adopts the term, Internet usage control, as a control or set of restrictions enforced by the Internet user's peers to prevent him from using the Internet, and it presumes that Internet usage control serves as a moderator moderating the extent of Internet addiction. As it were, this article predicts that the assumption that there is a difference in the extent of the effects of self, stress, and Internet addiction between groups with strict Internet usage control and those with little control when using the effect of Internet control as a moderator.

RESEARCH DESIGN

Before the survey was conducted, IT experts were invited to examine and modify the questionnaire items to secure appropriateness, and a pilot study was conducted among 50 members of the general public. This survey was given in the form of an online survey among general adult Internet users who subscribed to an online research firm named Pollever[1]. Samples were taken from 555,379 adult subscribers of Pollever, and the survey was conducted for a week from November 10, 2003 to November 17, 2003. As a result of the survey using the above questions, a total of 800 replies were returned. Omitting those with too many blank answers, 760 were found to be valid and accordingly processed to retrieve data.

The measurements which are used in this article are as follows.

Internet Addiction. To measure one's Internet addiction, the Internet Addiction Test based on five-point criteria developed by Young's Center for Online Addiction was adopted. These criteria were composed of 20 question items, and the total score determined one's state of addiction. Cases with a total score equal to or less than 50 points represent light addiction, while those totaling more than 80 points are considered critical addiction cases. The Reliability Coefficient of these criteria measured in Gye-Won Lee's (2001) study is Cronbach's alpha = 0.91, while that used in this study is Cronbach's alpha = 0.93.

Self-Esteem. To measure self-esteem, this study adopts Rosenberg's Self-Esteem Scale, which consists of 10 questions with five-point criteria and measures general self-esteem. The Reliability Coefficient of these criteria measured in Gye-Won Lee's (2001) study is Cronbach's alpha = 0.75, while that in this study is Cronbach's alpha = 0.72.

Self-Control. This study adopts the modified criteria reorganized by Hyun-Mi Nam (1999) to suit the general public with reference to self-control criteria used by Gottfredson and Hirschi (1990), and self-control composure criteria by Hyun-Sook Kim (1998). They are composed of a total of 20 question items and their scale measuring self-control consists of five-point scales. The Reliability Coefficient of this criterion measured in Gye-Won Lee's Study (2001) is Cronbach alpha = 0.74, while that in this study is Cronbach alpha = 0.74.

Self-Efficacy in Cyberspace. This study modifies and utilizes the tool to suit adult online users that Won-Young Song presented by translating and modifying Paulhus and Delroy's criteria (1983). It is composed of 9 question items with five-point scale

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[1] http://pollever.com

answers. The Reliability Coefficient of this criterion measured in Gye-Won Lee's Study (2001) is Cronbach alpha = 0.82, while that in this study is Cronbach alpha = 0.79.

Stress. To measure daily stress, this study also adopts the criteria which DeLongis, Folkman, and Mazarus (1998) used and Jeong-Hee Kim (1995) translated. They are composed of a total of 23 questions items using five-point scale based answers, signifying that the higher the score, the higher the stress level. Respondents were advised to reply to each item according to the extent of their worries they had had during the most recent week. The Cronbach alpha of the translated criteria is 0.92, while the one calculated in this study is 0.87.

Internet Usage Control. To measure Internet usage control, this study developed its own measurement tool including Internet usage control and restrictions set by the user's peers by referring to the criteria which the Commission on Youth Protection (2000) and Young-Soon Park (2000) used to identify parental control. A higher score indicates more strict control of Internet use. It is composed of a total of 19 question items, measuring Internet usage control and restrictions imposed upon the user by his peers. Each item utilizes a five-point scale, and a higher score means a higher level of Internet usage control. The Cronbach's alpha this study calculated is 0.84.

FINDINGS

Direct Effect

In the regression equation derived from Table 1, subordinate variables are Internet addiction while independent variables are self-esteem, self-control, self-efficacy, stress, and Internet usage control. The objects of verification are Hypothesis1 through 5. As a result, the effect of independent variables over subordinate variables is found to be significant with $p < 0.001$ and an explanation power of 42.3%. Hypotheses 1 & 2 are adopted because self-esteem and self-control are interpreted as variables that have a negative effect on Internet addiction. On the other hand, Hypothesis 3, 4, and 5 are adopted because self-efficacy in cyberspace, stress, and Internet usage control are interpreted as variables that have a positive effect on Internet addiction. However, although Hypothesis 5, which states that subjects with higher Internet usage control are less likely to become addicted to the Internet than those with low control, is negative, the actual research findings show positive relationships. The existing studies show that Internet usage control has a negative influence on Internet addiction. However, although most of the existing studies deal with parental control of children's Internet use,

possibly causing the children to resist their parents, the extent of their Internet use is controlled by their parents and they tend to obey their parents; In case of general adult users of the Internet, as they are controlled by their peers, the control is not so powerful and, thus, is left in the hands of the users themselves. Namely, the stronger the Internet control, the more resistance users will express thus raising the potential of becoming addicted to the Internet due to a stronger will to defy the control.

Table 1. Result of Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Adjusted R Square	VIF
	B	Std.Error	Beta				
(Constant)	1.928	.245		7.879	.000		
Self-esteem	-.226	.043	-.169	-5.262	.000		1.361
Self-control	-.301	.056	-.174	-5.378	.000	.423	1.373
Self-efficacy	.349	.035	.300	9.922	.000		1.199
Stress	.315	.042	.231	7.530	.000		1.241
Internet usage cont	.189	.033	.180	5.782	.000		1.278

Dependent Variable: Internet Addiction

Moderating effect

Hypothesis 6-1 assumes that Internet usage control affects the extent of the relationship between self-esteem and Internet addiction as a moderator.
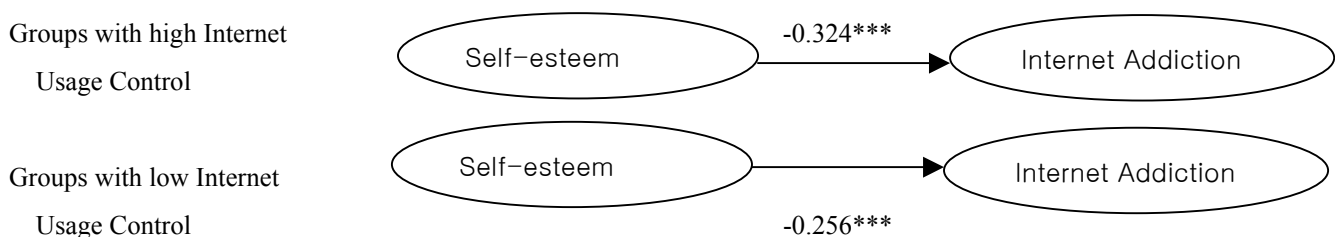

Figure 3. Comparison of Internet usage control by Group

To verify the moderating effect on the relationship between self-esteem and Internet addiction, a regression analysis was conducted primarily with Internet addiction as a subordinate variable, and self-esteem, self-control, self-efficacy in cyberspace, stress, and Internet use moderator as independent variables, which produced the result of $R^2 =$

0.427. Next, to verify the moderating effect, R^2 and a volume change of R^2 in the result of regression analysis with addiction of interaction term composed of multiplication of self-esteem and Internet usage control (self-esteem * Internet usage control) equal 0.433 and 0.006, respectively. The volume change of increased explanation power is found to be significant at $p < 0.01$. Therefore, it is proved that there is mutual interaction effect (moderating effect) between self-esteem and Internet usage control. In addition, as shown in Beta value of interaction variables (-0.608) and Figure 3, groups with high Internet usage control show greater additional influence of self-esteem on Internet addiction than the groups with low control. Therefore, it can be said that Hypothesis 6-1 is well proved.

Hypothesis 6-2 assumes that Internet usage control affects the extent of the relationship between self-control and Internet addiction as a moderator.
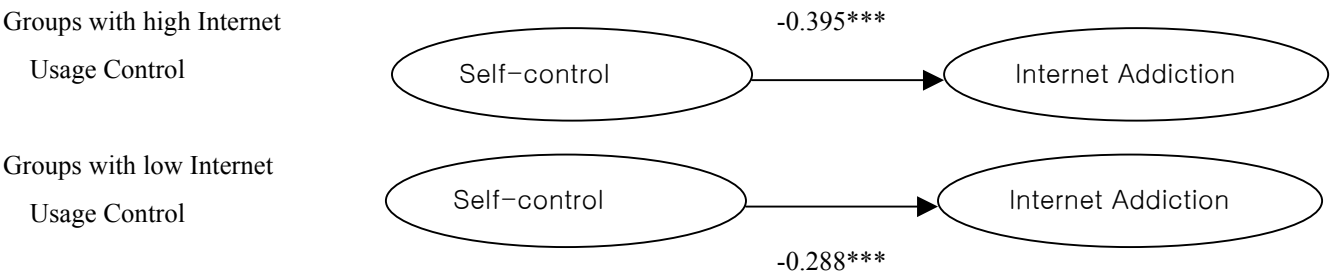
Groups with high Internet Usage Control

Self-control   -0.395***   Internet Addiction

Groups with low Internet Usage Control

Self-control   Internet Addiction
-0.288***

Figure 4. Comparison of Internet Usage Control by Group

R^2 and volume change of R^2 in the result of the regression analysis with addiction of interaction term found by the multiplication of self-control and Internet usage control (self-control * Internet usage control) are 0.432 and 0.005, respectively. The volume change of increased explanation power is found to be significant at $p < 0.01$. Therefore, it is proved that there is mutual interaction effect (moderating effect) between self-control and Internet usage control. In addition, as shown in Beta value of interaction variables (-0.640 with significance level of 0.001) and Figure 4, groups with high Internet usage control show greater additional influence of self-control on Internet addiction than the groups with low control. Therefore, it can be said that Hypothesis 6-2 is well proved.

Hypothesis 6-3 assumes that Internet usage control affects the extent of the relationship between self-efficacy in cyberspace and Internet addiction as a moderator. The regression analysis with addiction of interaction term found by multiplying self-efficacy

in cyberspace and Internet usage control (self-efficacy in cyberspace * Internet usage control) is found to be not significant. Therefore, it can be said that Internet usage control does not work as a moderator when self-efficacy in cyberspace affects Internet addiction.

Hypothesis 6-4 assumes that Internet usage control affects the extent of the relationship between stress and Internet addiction as a moderator.
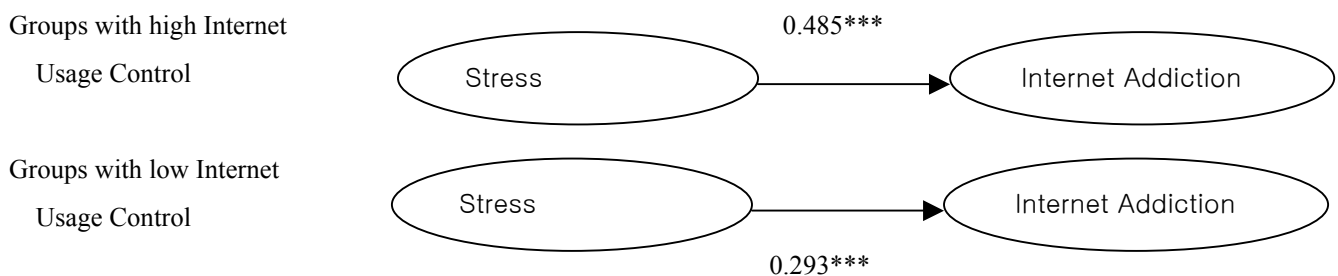
Groups with high Internet
Usage Control

Stress → Internet Addiction   0.485***

Groups with low Internet
Usage Control

Stress → Internet Addiction   0.293***

Figure 5. Comparison of Internet usage control by Group

R^2 and volume change of R^2 in the result of the regression analysis with addiction of interaction term found by multiplying stress and Internet usage control (stress * Internet usage control) are 0.432 and 0.005, respectively. The volume change of increased explanation power is found to be significant at $p < 0.05$. Therefore, it is proved that there is mutual interaction effect (moderating effect) between stress and Internet usage control. In addition, as shown in Beta value of interaction variables (-0.396 with significance level of 0.05) and Figure 5, groups with high Internet usage control show greater additional influence of stress on Internet addiction than the groups with low control. Therefore, it can be said that Hypothesis 6-4 is well proved.

CONCLUSION

We found that self-esteem, self-control, self-efficacy in cyberspace, stress, and Internet usage control have direct effects that determine Internet addiction. It was found that all of these produced valid significant results.

First, survey results on self-esteem suggested that those with high self-esteem have low potential of Internet addiction. The results also indicate that those who place positive values on themselves in reality are less likely to become engrossed in cyberspace. The relationship between Internet addiction and self-control showed a negative correlation,

thus the higher the point of self-control, the lower Internet addiction level is. This means that groups pursuing instant satisfaction and lacking concentration easily become addicted to the Internet. Self-efficacy in cyberspace has a positive correlation with Internet addiction. Adults belonging to addict groups have higher self-efficacy than those belonging to non-addict groups. That people with high self-efficacy in cyberspace spend more time on the Internet accords with Bandura's view (1976) that one's belief in their own ability to do something and the expected outcome allow the activity to continue. That is to say, if one thinks they are competent and can meet satisfactory results in cyberspace, they tend to use the Internet more. Stress also has a positive correlation with Internet addiction. Thus, adult addicts have higher stress than non-addicts, which indicates that they avoid real conflicts and problems instead of solving them. They may be able to escape from stress and real problems temporarily, but as actual problems reappear, they suffer much more. Again they engage themselves in the Internet to escape reality, which eventually creates a vicious cycle. Therefore, it can be said that stress and conflicts in reality play an important role in causing Internet users to fail to face real problems, escape from them in long term, and eventually lead them to Internet addiction. We can find a positive correlation between Internet usage control and Internet addiction. Adults belonging to addict groups have higher Internet usage control than those in non-addict groups. It can be presumed that conflicts arise between adult online users' desire to freely use the Internet and the attempts of their peers to control or restrict their Internet which only succeeds in creating resistance and eventual excessive use of the Internet.

The last research topic is to find out the moderating effects of Internet usage control between self-esteem, self-control, self-efficacy in cyberspace, stress, and Internet addiction. There are significant results from the moderating effect of Internet usage control and the influence of self-esteem, self-control, and stress on Internet addiction, but the moderating effects of Internet usage control are found not to be significant between self-efficacy in cyberspace and Internet addiction.

It is an important implication that moderating self-esteem, self-control, and stress, while reflecting on the optimal level of Internet usage control, is the most effective way to lessen Internet addiction, instead of maintaining general characteristics of promoting self-esteem and self-control and decreasing stress.

LIMITATIONS AND FUTURE RESEARCHES

This study has several limitations. The data were collected from an online research firm named Pollever to which general adult Internet users subscribed. Reliance on single online research firm is a limitation. Furthermore, since this study was conducted only among adult online users, adults who do not use online were excluded. Thus, it is possible that another study using a range of both users and non-users might have different findings. It would be advisable that future studies overcome the limit of samples this study. The next limit is the inherent limitation of time. The Internet is constantly changing and the number of Internet users is increasing rapidly. Since there is a possibility that different online populations would show different aspects of Internet use, vertical studies on this research are recommended.

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