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MMPI-A Profiles of Adolescents at High-risk of Internet Addiction

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Internet addiction is a widespread problem in Korean society that has not been extensively studied using psychological assessment tools. In this investigation, the psychological functioning of adolescents at high-risk of internet addiction was examined through the use of the Minnesota Multiphasic Personality Inventory-Adolescents(MMPI-A). Two hundred thirty-six adolescents(106 boys and 130 girls) were evaluated on the level of internet addiction using Young's Internet Addiction Inventory. Based on the IAI total score, 98 adolescents(53 boys and 45 girls) with IAI total score of 50 or greater were classified as high-risk group and 88 adolescents(36 boys and 52 girls) with the IAI total score less than 50 were classified as low-risk group. Both boys and girls at high-risk produced significant elevations on the Infrequency(F, F1, F2), Hs, D, Pt, Sc, and Si, with additional elevations on the Hy, Pd, and Pa scales for high-risk girls. MMPI-A content and supplementary scales revealed elevations on numerous scales including A-anx, A-obs, A-dep, A-hea, A-cyn, A-aln, A-lse, A-las, A-sod, A-fam, A-sch, A-trt, A, and IMM for high-risk groups. High-risk boys obtained significantly elevated A-lse scores than high-risk girls, indicating more self-esteem problems. High-risk girls may have more depressed mood as indicated by significantly lower scores on Ma with elevated D scores. The MMPI-A substance abuse scales such as MAC-R, ACK, and PRO did not differ significantly between high-risk and low-risk groups, suggesting that further research should empirically evaluate their effectiveness in assessing internet addiction and, if needed, develop a new subscale to measure internet addiction.

Key Words : internet addiction, MMPI-A

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Many clinicians and researchers have believed that the term addiction should only be applied to cases involving the ingestion of physical substances (e.g., Walker, 1989; Rachlin, 1990). However, similar criteria have been applied to a number of problem behaviors that do not involve an intoxicant such as pathological gambling(Griffiths, 1990), overeating(Lesuire & Bloome, 1975), exercise (Morgan, 1979), video game playing(Morgan, 1979), and computer addiction(Shotton, 1991). While substance dependence dose not offer a direct benefit for its routine usage, the internet, unlike chemical dependency, offers several direct benefits as a revolutionary technology(Levy, 1996). For example, through the internet, it is possible to perform business transactions, to communicate with others from a distance, to do a shopping, or to access vast amounts of information across a breadth of topics. While the hallmark consequence of substance dependence is the medical implication involved such as cirrhosis of the liver due to alcoholism, the physical risk factors involved with internet addiction are comparatively minimal yet notable. Although time is not a direct function in defining internet addiction, addicted users are likely to spend enormous amount of time using the internet. Prolonged internet use may result in various physical side-effects such as sleep deprivation, excessive fatigue, and back-or eye-strain. While the physical side effects of internet use are mild compared to substance dependence, addictive use of the internet would result in similar familial, academic, and occupational impairment(Brenner, 1996; Egger, 1996; Griffiths, 1997; Morahan-Martin, 1997; Young, 1996).

Proper diagnosis of internet addiction is often complicated by the fact that there's currently no accepted set of criteria for internet addiction. By using the criteria of pathological gambling listed in the Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition(DSM-IV; American Psychological Association, 1995) as a model, Young (1996) defined pathological internet use as an impulse-control disorder, which does not involve an intoxicant. Young developed a brief eight-item questionnaire which modified criteria for pathological gambling: (1) preoccupation with the internet, (2) the need to use the internet with increasing amount of time to achieve satisfaction, (3) repeated but unsuccessful efforts to control, cut back, or stop internet use, (4) feeling restless, moody, depressed, or irritable when attempting to cut down or stop internet use, (5) staying on-line longer than originally intended, (6) the loss of significant relationship, job, educational or career opportunity because of the internet use, (7) lying to family members or others to conceal the extent of involvement with the internet, and (8) using the internet as a way of escaping from problems or of relieving a dysphoric mood. Respondents were considered "addicted" when answering yes to five or more of the questions and when their behavior could not be better accounted for by a Manic Episode. Young(1996) noted that while this scale provides a workable measure of internet addiction, further study is needed to determine its construct validity and clinical utility.

Goldberg(1996) also suggested the seven

criteria for assessing internet addiction: (1) tolerance due to inappropriate internet use, (2) withdrawal, (3) using the internet longer than originally intended, (4) failure to stop internet use, (5) spending a great deal of time in the internet-related activities, (6) significant social, occupational, or recreational impairment, (7) continued internet use despite the awareness of having a persistent or recurrent physical, social, occupational, and psychological problems due to internet use. A diagnosis of internet addiction is based on the presence of 3 or more of these symptoms occurring at any time in the same 12-month period.

Studies on internet addiction which used on-line survey methods showed that self proclaimed addicted users often looked forward their next internet use, felt nervous when off-line, lied about their internet use, easily lost track of time, and felt the internet caused problems in their jobs, finances, and social relationships(e.g., Brenner, 1996; Egger, 1996). Studies conducted on college campuses reported that students suffered significant academic and relationships impairment due to excessive and uncontrolled internet use(Morahan-Martin, 1997; Scherer, 1997).

Despite the increased concern about internet addiction, the characteristics linked to "at risk" populations causing such a dependence on the internet are only slowly beginning to be studied. Loytsker and Aiello(1997) reported that high levels of boredom proneness, loneliness, social anxiety, and private self-consciousness all predicted internet addiction. Young(1998) conducted a research to assess personality traits associated with internet addiction by utilizing the Sixteen Personality Factor Inventory(16PF). Addictive internet users ranked high in terms of self-reliance, emotional sensitivity and reactivity, vigilance, low self-disclosure, and non-conformist characteristics.

Internet addiction and related conduct problems have recently become one of the most serious adolescent issues in Korea(Lee, 2001). Recent surveys reveal that 49%(675 cases) of the cyber crimes were committed by teenagers(Chungang Ilbo, 2001), and such cyber crimes are related to internet addiction including addiction to cyber pornography, violent games, and chatting for cybersex(Cho, 2000). Although internet addiction is not limited to a group of adolescents and almost 37% of adolescents attending middle and high schools in Seoul show symptoms related to internet addiction(Kim, 2001), little has been researched on this issue and gender difference has rarely been examined. Chung & Han(2000) reported that adolescents addicted to the internet showed higher levels of sensation seeking tendency, particularly boredom proneness, than those not addicted to the internet. Research by Lee and his colleagues (2001) showed that adolescents at high risk of internet addiction had low self-esteem, poor self-control, and communication problems with their parents, and felt lonely and stressful. Lee(2002) reported that adolescents addicted to the internet games showed significantly higher levels of impulsivity, aggressiveness, conformity, and modeling than those without internet use problems. Lee(2002) also found that compared to non internet addicts, adolescents with internet addiction tended to be less satisfied with their schools and less

attached to their parents, and had less social support from their friends, family, and school teachers.

Although the Minnesota Multiphasic Personality Inventory(MMPI) is the most frequently used objective test of personality and psychopathology for both adults and adolescents(Archer, Maruish, Imhof, & Piotrowski, 1991; Watkins, Campbell, Nieberding, & Hallmark, 1995), no studies utilizing the MMPI have been conducted to assess psychological characteristics of internet dependents. Thus, studies with this widely used personality inventory would be needed to yield a further understanding of the personality traits associated with the development of internet addiction.

Many researchers and clinicians pointed out that the MMPI did not account for distinctive adolescent response patterns on the MMPI since the MMPI was originally developed for use with adults(Archer, 1987; Colligan & Offord, 1989). In response to these issues, the Minnesota Multiphasic Personality InventoryAdolescents (MMPI-A; Butcher et al., 1992), a revised form of the MMPI developed specifically for the assessment of adolescent psychopathology and normed on a contemporary sample of adolescents, was released in 1992. Similar to the objectives in developing the MMPI-2, every effort was made to retain the most useful and productive aspects of the original test instrument while improving several less desirable features of the MMPI. The MMPI-A contains 478 items, reflecting a shortening of the original test instrument by 88 items. Seventy items were revised or modified to simplify wording or to improve the relevance of item content to adolescent life experiences. For example, the item, "I was fond of excitement when I was young(or in childhood)" was modified for the MMPI-A to, "I like excitement." and "During one period when I was a youngster I engaged in petty thievery" was modified to "I have sometimes stolen things." In addition, a variety of new items not in the original MMPI item pool were included into the MMPI-A to provide coverage of adolescent specific topics. For example, the item, "Sometimes I use laxatives so I won't gain weight," was added to the MMPI-A. The MMPI-A maintained the original MMPI Validity and Clinical scales because of the scales' demonstrated ability to predict adolescents' problems and behaviors(Archer, Gordon, Giannetti, & Singles, 1988). It also included 15 new Content scales that were specifically created to assess adjustment concerns common to most adolescents. Although 11 of the 15 MMPI-A content scales overlap with the MMPI-2 content scales, adolescent issues have been addressed in the development of four new content scales, including Low Aspirations(A-las), Conduct Problems(A-con), Alienation(A-aln), and School Problems(A-sch) (Williams, Butcher, Ben-Porath, & Graham, 1992).

The Korean version of the MMPI-A was developed by Lim and Han(1999). They first adapted the items of the Korean MMPI-2(Han, 1996) that are common to the MMPI-2 and MMPI-A, and then independently translated into Korean the items that are unique to the MMPI-A. Discrepancies between the two independent translations were solved by mutual consensus. These items were then submitted to a bilingual student for back- translation into English. The

original English MMPI-A items and the back-translated English items were then examined for discrepancies by an American psychologist who was one of the members of the MMPI Restandardization Committee and who is an expert in MMPI cross-cultural work. This led to a review and retranslation of several items.

Recent study by Lim and Han(2000) provided initial information about cross-cultural performance on this new translation of the MMPI-A, including differences between Korean and American adolescents on MMPI-A scales, differences on MMPI-A items, and cross-cultural similarities in gender differences. Mean Korean adolescent T-scores on the MMPI-A validity, clinical, and content scales all fell within one SD of the U.S. adolescent means, indicating that mean profiles of Korean adolescents are very similar to those of American counterparts. Item endorsement differences between Korean adolescents and American adolescents were modest, and gender-related item differences for Koreans were strikingly consistent with those for Americans.

Building on the work of Lim and Han's preliminary investigation on the Korean version of the MMPI-A, this study was conducted (a) to assess the personality traits of adolescents at high-risk of internet addiction utilizing the Korean MMPI-A, (b) to explore differences on the MMPI-A profiles between boys and girls with internet addiction, and (c) to evaluate the effectiveness of the MMPI-A substance abuse scales such as MAC- R, ACK, and PRO in assessing internet addiction.

METHOD

Participants

Participants in this study were 236 adolescents attending middle and high schools in Seoul and Kyungki-do. Participating schools were recruited through personal contact. After receiving informed consent from the students and their parents, the Korean MMPI-A and the Korean translation of Young's Internet Addiction Inventory(IAI; Young, 1998) were administered by a school teacher or counselor in a classroom. Data from 9 participants were eliminated from the study for either 30 or more "Cannot Say" responses, a raw score of 25 or greater on the F scale, or participant age less than 14 or greater than 18(Butcher et al., 1992). The final sample consisted of 227 students(100 boys and 127 girls), with a mean age of 15.8 years for boys and 15.9 for girls.

Instrument and Procedure

Internet Addiction Inventory

The Internet Addiction Inventory(IAI; Young, 1998) is a 20-item scale that assesses the possibility of internet addiction. Participants rate along a 6-point Likert type scale ranging from 0(never) to 5(always) indicating how often they experience the described feelings and behaviors related to the internet use. Total score ranges from 0 to 100. Young suggested that a total score of 50 or greater indicate high risk of internet addiction, with a total score of 80 or greater indicating severe internet addiction. Lee et al. (2001) translated the

IAI into Korean and revised some items to improve the relevance of item content to adolescent life experiences. The IAI has yielded Cronbach's alpha of .91 and two-week interval test-retest reliability of .87.

MMPI-A

The Korean version of the MMPI-A (Lim & Han, 1999) was administered with the IAI.

Data Analyses

Considering Young's(1998) classification rule of internet addiction based on the IAI total score, participants with a total score of 50 or greater were classified as a high-risk group of internet addiction. Participants with the IAI total score less than 50 were used as a comparison group, indicating a low-risk group of internet addiction. The high-risk group consisted of 53 boys and 45 girls. The low-risk group consisted of 36 boys and 52 girls. Then, the mean profile configuration of adolescents at high-risk of internet addiction was compared to the mean profiles of adolescents at low-risk of internet addiction. Next, Multivariate analysis of variance(MANOVA) was conducted to test the overall significance of the hypothesis that there are no differences between mean profiles for the high-risk and low-risk groups. When the multivariate results were significant, further univariate analyses were performed to determine which scales contribute to the overall differences between the two groups. Each analysis was conducted separately by gender. Finally, the same analyses were performed between high-risk boys and high-risk girls to examine gender effect on internet addiction.

RESULTS

Figure 1 displays the mean profiles of the boys at low-risk and high-risk of internet addiction on the MMPI-A validity and clinical scales. Adolescents at high-risk of internet addiction obtained T-score of 65 or greater(clinical cut-off) on scales 2(Depression [D]), 7(Psychasthenia [Pt]), and 0(Social Introversion [Si]). Both boys and girls at high-risk of internet addiction produced elevated scores(i.e., at least 5 T-score points higher than their counterparts at low-risk) on the Infrequency(F, F1, F2), Hs, D, Pd, Pa, Pt, Sc, and Si scales, with lower scores on the Defensiveness(K) scale. Girls at high-risk produced an additional elevation on Hy.

A multivariate analysis of variance(MANOVA) was performed comparing high-risk groups to low-risk groups on the validity and clinical scales. For boys and girls, the results of MANOVA were significant($F(15, 73)=14.4$, $p=.000$ for boys, $F(5,91)=67.6$, $p=.000$ for girls). Thus, univariate tests (t) were conducted comparing high-risk group's scores on each of the validity and clinical scales to the scores of low-risk group, for boys and girls separately. Applying the Bonferroni correction for 15 simultaneous statistical tests, alpha was set at .003. As presented in Table 1, these analyses indicated that both boys and girls at high-risk produced significantly higher scores on the Infrequency(F, F1, F2), Hs, D, Pt, Sc, and Si, with significantly lower K scale scores

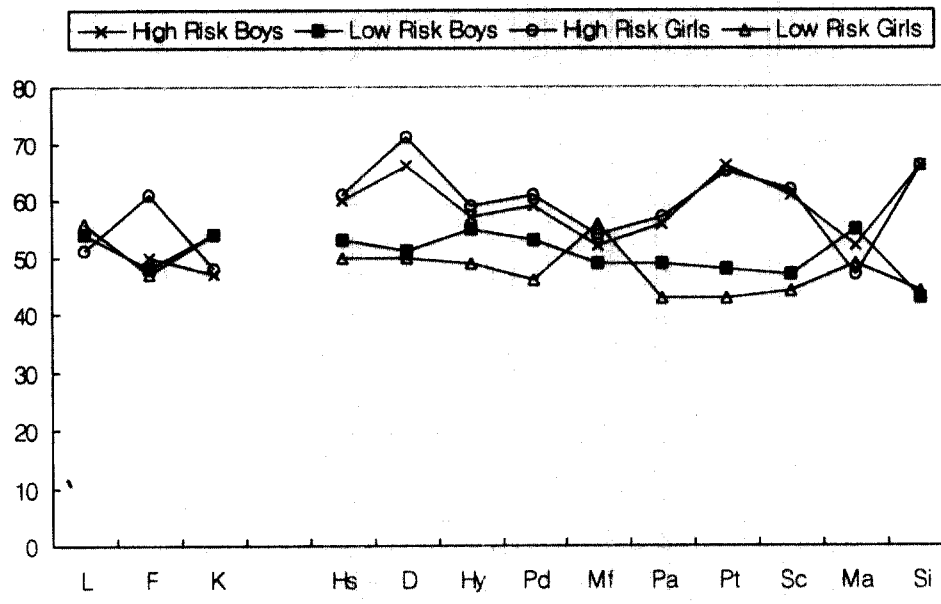

Figure 1. Mean Profiles of Validity and Clinical Scales for High Risk and Low Risk Groups

than their counterparts at low-risk. In addition, girls at high-risk obtained significantly elevated scores on Hy, Pd, and Pa scales compared to low-risk girls.

A second set of analyses, paralleling those conducted with the validity and clinical scales, was performed with the MMPI-A content and supplementary scales. Figure 2 shows that boys and girls at high-risk produced T-score of 65 or greater(clinical cut-off) on scales Adolescent-depression(A-dep), Adolescent-low self-esteem(A-lse), and Adolescent-social discomfort(A-sod), with an additional scale, A-aln(Adolescent-alienation), elevated for high- risk girls. Compared to low-risk adolescents, high-risk adolescents obtained elevated scores(i.e., at least 5 T-score points higher than their counterparts at low-risk) on most of the scales, with the exception of substance abuse scales such as MAC-R, ACK, and PRO.

MANOVA showed overall differences between the MMPI-A content and supplementary scale profiles produced by high- and low-risk groups ($F(21,67)=11.3$, $p=.000$ for boys, $F(21,75)=19.3$, $p=.000$ for girls). Therefore, univariate t tests were conducted to examine which scales revealed the differences between the high-risk and low-risk groups, for boys and girls separately. Applying the Bonferroni correction for 15 simultaneous statistical tests, alpha was set at .002. As presented in Table 2, for both boys and girls, high-risk group scored significantly higher than low-risk group on a number of scales including Adolescent-anxiety (A-anx), Adolescent-obsessiveness(A-obs), Adolescent-depression(A-dep), Adolescent-health concern(A-hea), Adolescent-cynicism(A-cyn), Adolescent-alienation(A-aln), Adolescent-low self-esteem(A-lse), Adolescent-low

Table 1. Means, Standard Deviations, and t-test values of Validity and Clinical Scales

Scale	Low Risk			High Risk	
	M	*SD*	*t*	*M*	*SD*
Boys					
L	54.3	11.6	1.8	50.4	9.6
F	48.3	5.6	-6.2***	57.6	7.7
F1	48.4	6.9	-3.4***	54.4	9.0
F2	48.8	6.4	-6.5***	59.6	8.5
K	53.9	10.4	3.3***	46.7	10.2
Hs	53.0	9.1	-3.5***	60.2	10.0
D	51.1	8.7	-6.9***	65.8	10.6
Hy	55.4	7.9	-1.1	57.4	8.7
Pd	52.9	9.7	-2.8**	58.9	10.2
Mf	48.8	8.6	-1.5	51.5	8.3
Pa	49.3	9.3	-2.9**	56.3	12.2
Pt	47.5	9.1	-8.9***	65.9	10.0
Sc	47.3	7.7	-7.6***	61.4	9.0
Ma	54.7	10.4	1.3	52.3	7.9
Si	43.4	6.4	-13.6***	65.5	8.1
Girls					
L	55.7	11.9	2.0*	51.2	9.8
F	46.8	4.7	-8.5***	61.0	10.4
F1	46.4	6.4	-6.5***	59.5	12.2
F2	47.5	5.0	-8.0***	60.8	10.1
K	54.0	8.4	3.2***	48.0	10.2
Hs	50.4	7.7	-5.6***	60.7	10.2
D	50.1	8.6	-9.3***	70.9	12.8
Hy	49.4	9.0	-4.1***	58.5	12.4
Pd	46.1	7.6	-8.7***	61.4	9.5
Mf	56.0	9.2	1.0	54.1	8.7
Pa	43.3	6.9	-7.7***	57.0	10.1
Pt	43.3	5.3	-11.8***	65.1	10.1
Sc	43.8	5.0	-9.4***	61.9	12.1
Ma	49.1	9.2	1.5	46.5	7.8
Si	44.3	5.8	-15.7***	66.4	8.0

Note. n=36 for boys in the low risk group. n=53 for boys in the high risk group.

n= 52 for girls in the low risk group. n=45 for girls in the high risk group.

* $p < .05$. ** $p < .01$. *** $p < .003$ (using the Bonferroni correction).

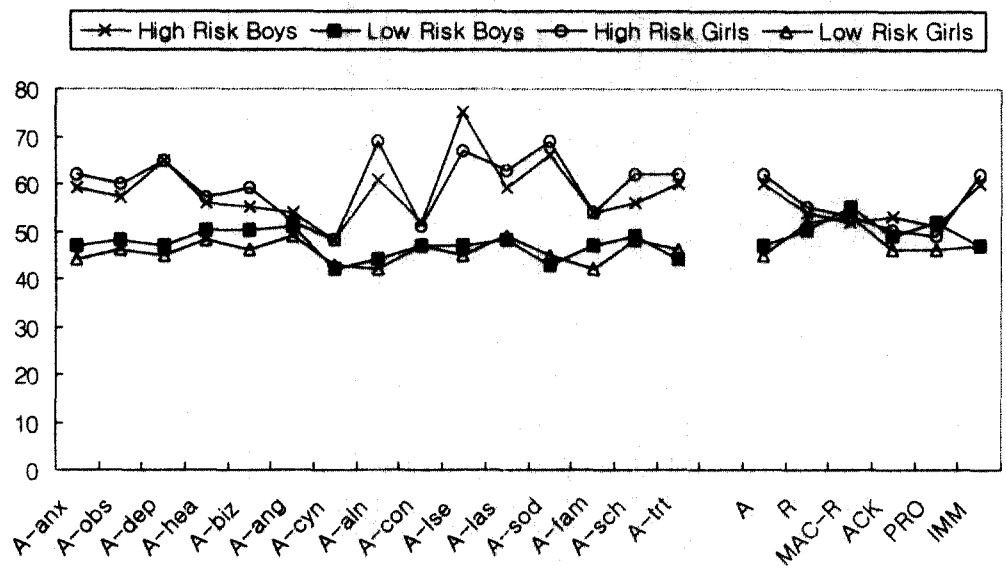

Figure 2. Mean Profiles of Content and Supplementary Scales for High Risk and Low Risk Groups

Table 2. Means, Standard Deviations, and t-test values of Content and Supplementary Scales for High Risk and Low Risk groups

Scale	Low Risk			High Risk	
	M	*SD*	*t*	*M*	*SD*
Boys					
A-anx	47.1	8.6	-5.5***	58.7	10.5
A-obs	48.4	8.3	-4.2***	57.2	10.7
A-dep	47.2	8.3	-9.1***	64.9	9.5
A-hea	49.7	6.6	-3.6***	55.9	9.0
A-biz	50.2	9.4	-2.6*	55.0	8.2
A-ang	51.3	11.0	-1.0	53.7	10.9
A-cyn	41.6	5.4	-4.5***	48.2	8.4
A-aln	43.8	6.1	-8.9***	61.0	11.9
A-con	47.1	9.1	-2.4*	52.4	10.6
A-lse	47.1	9.9	-10.7***	74.9	13.3
A-las	47.8	10.0	-4.9***	58.8	10.7
A-sod	43.2	4.8	-12.4***	66.4	12.3
A-fam	46.7	7.5	-4.0***	54.3	10.4

A-sch	**49.3**	**8.5**	**-3.7*** **	**56.1**	**8.7**
A-trt	44.4	8.0	-7.4***	60.4	12.5
A	46.9	7.9	-7.6***	60.2	8.3
R	50.0	7.8	-2.5*	54.4	8.4
MAC-R	55.3	7.2	2.1	51.5	9.4
ACK	48.5	7.7	-2.1	52.5	9.4
PRO	52.1	9.7	.7	50.6	11.5
IMM	46.6	7.8	-8.1***	59.9	7.5
Girls					
A-anx	44.3	6.6	-8.9***	61.6	11.4
A-obs	46.2	6.8	-8.0***	59.9	9.7
A-dep	44.9	6.7	-11.8***	65.1	9.7
A-hea	48.4	6.6	-4.9***	56.7	9.5
A-biz	46.0	6.0	-6.1***	58.5	12.6
A-ang	48.9	8.3	-1.7	52.1	10.5
A-cyn	42.6	4.2	-4.7***	48.2	7.2
A-aln	42.0	5.3	-12.3***	68.7	13.7
A-con	46.7	8.5	-2.3*	51.2	10.6
A-lse	45.1	6.3	-11.7***	66.6	10.8
A-las	48.5	7.3	-7.4***	62.6	10.7
A-sod	44.8	4.0	-12.3***	69.3	12.8
A-fam	42.0	6.4	-6.1***	54.3	12.2
A-sch	47.7	7.6	-7.0***	62.0	11.6
A-trt	45.6	6.7	-8.9***	62.0	10.7
A	45.1	6.9	-10.6***	61.8	8.6
R	51.7	9.2	-1.3	54.9	13.8
MAC-R	52.7	10.1	-.2	53.1	9.0
ACK	46.0	6.5	-2.6*	49.5	6.5
PRO	46.0	7.1	-1.8	49.3	10.2
IMM	47.2	7.4	-9.1***	61.7	8.4

Note. n=36 for boys in the low risk group. n=53 for boys in the high risk group.

n= 52 for girls in the low risk group. n=45 for girls in the high risk group.

* p < .05. ** p < .01. *** p < .002 (using the Bonferroni correction).

Table 3. Means, Standard Deviations, and t-test values of Validity and Clinical Scales for Boys and Girls at High Risk

Scale	Boys			Girls	
	M	*SD*	*t*	*M*	*SD*
L	50.4	9.6	-.4	51.2	9.8
F	57.6	7.7	-1.9	61.0	10.4
F1	54.4	9.0	-2.4*	59.5	12.2
F2	59.6	8.5	-.6	60.8	10.1
K	46.7	10.2	-.6	48.0	10.2
Hs	60.2	10.0	-.2	60.7	10.2
D	65.8	10.6	-2.2*	70.9	12.8
Hy	57.4	8.7	-.5	58.5	12.4
Pd	58.9	10.2	-1.2	61.4	9.5
Mf	51.5	8.3	-1.5	54.1	8.7
Pa	56.3	12.2	-.3	57.0	10.1
Pt	65.9	10.0	1.3	65.1	10.1
Sc	61.4	9.0	.8	61.9	12.1
Ma	52.3	7.9	3.6***	46.5	7.8
Si	65.5	8.1	-.5	66.4	8.0

Note. n= 53 for boys. n=45 for girls.

* $p < .05$. ** $p < .01$. *** $p < .003$ (using the Bonferroni correction).

aspiration(A-las), Adolescent-social discomfort(A-sod), Adolescent-family problems(A-fam), Adolescent-school problems(A-sch), Adolescent-negative treatment indicators(A-trt), Anxiety(A), and Immaturity (IMM). In addition, girls at high-risk obtained significantly higher scores on the Adolescent-bizarre mentation scale(A-biz).

Finally, mean MMPI-A profiles were comparedbetween high-risk boys and high-risk girls to explore gender difference in internet addiction, as shown in Tables 3 and 4. The Ma and A-lse scales showed significantly higher scores for high-risk boys compared to high-risk girls.

DISCUSSION

Mean MMPI-A profiles obtained by the adolescents at high-risk of internet addiction portray an overall picture of a rather broad array of personality dysfunction. Adolescents at high-risk appear to be self-preoccupied, dissatisfied, depressed, anxious, obsessive, and inhibited, based on their prominent scale elevations on the Hs, D, Pt, Sc, and Si scales. They appear to be alienated from society, and possess misanthropic attitudes, expecting hidden negative motives behind the acts of others. They report experiencing much discomfort in social

Table 4. Means, Standard Deviations, and t-test values of Content and Supplementary Scales for Boys and Girls at High Risk

Scale	Boys			Girls	
	M	*SD*	*t*	*M*	*SD*
A-anx	58.7	10.5	-1.3	61.6	11.4
A-obs	57.2	10.7	-1.3	59.9	9.7
A-dep	64.9	9.5	-.1	65.1	9.7
A-hea	55.9	9.0	-.4	56.7	9.5
A-biz	55.0	8.2	-1.6	58.5	12.6
A-ang	53.7	10.9	.7	52.1	10.5
A-cyn	48.2	8.4	.0	48.2	7.2
A-aln	61.0	11.9	-3.0*	68.7	13.7
A-con	52.4	10.6	.6	51.2	10.6
A-lse	74.9	13.3	3.3**	66.6	10.8
A-las	58.8	10.7	-1.8	62.6	10.7
A-sod	66.4	12.3	-1.1	69.3	12.8
A-fam	54.3	10.4	.0	54.3	12.2
A-sch	56.1	8.7	-2.9*	62.0	11.6
A-trt	60.4	12.5	-.7	62.0	10.7
A	60.2	8.3	-1.0	61.8	8.6
R	54.4	8.4	-.2	54.9	13.8
MAC-R	51.5	9.4	-.9	53.1	9.0
ACK	52.5	9.4	1.9	49.5	6.5
PRO	50.6	11.5	.6	49.3	10.2
IMM	59.9	7.5	-1.1	61.7	8.4

Note. n= 53 for boys. n=45 for girls.

** p < .01. ** p < .002 (using the Bonferroni correction).

situations with feelings of considerable emotional distance from others. These adolescents also tend to have self-esteem problems and be disinterested in being successful, avoiding facing difficulties. Results also suggest that the adolescents at high-risk of internet addiction have considerable problems with their parents and other family members and numerous difficulties in school. These results appear to be similar to Young's report(1998) about personality traits of adult internet dependents using the 16PF and previous report about psychological characteristics of Korean adolescents addicted to the internet(Lee et al., 2001; Lee, 2002).

Substantial research on the MMPI and MMPI-2 clinical scales has shown that the Pd, D, and Pt scales are prominent in individuals with addictive disorders including alcohol and drug abuse problems (Butcher & Williams, 1992). Elevation on the Pd

scale has been most often associated with addictive behavior(Craig, 1988; MacAndrew, 1978). In addition, several MMPI code types, usually incorporating these scales, have been related to patterns of addictive behavior (Butcher & Williams, 1992; Kristianson, 1981; Schroeder & Pierce, 1979). The MMPI-A profiles produced by the adolescents at high-risk of internet addiction in this study showed high elevations(T score 65) on D and Pt, with moderately elevated scores on Pd. Therefore, the MMPI-A clinical scale patterns of the adolescents at high-risk of internet addiction may be thought to be similar to those of individuals with addictive behavior such as alcohol and drug problems. However, one should be cautious to conclude that the personality patterns of internet addicts may resemble those of alcohol and drug abusers, until further research is conducted to empirically assess personality characteristics and lifestyle patterns associated with internet addiction in clinical populations. In line with this caution, the MMPI-A scales, MAC-R, ACK, and PRO, which have been typically used and known to be effective in assessing substance abuse problems, did not differ significantly between high-risk and low-risk groups. These results are considered to suggest that the symptoms and nature of internet addiction may differ from those of alcohol and drug addiction. Considering the fact that the MAC-R, ACK, and PRO scales were originally developed for measuring alcohol and drug problems and internet addiction is a relatively new area to be researched further, attempts should be made to empirically examine the effectiveness of the MAC-R, ACK, and PRO in assessing internet addiction and develop a specific index or a new subscale to assess internet-related problems. Further research should focus on differentiation between alcohol and drug abuse and internet addiction, and explore how psychiatric illness such as depression, obsessive-compulsive disorder, or schizophrenia may play a role in the development of internet addiction problems. In addition, adolescents at high-risk of internet addiction obtained highly elevated Si and A-sod scores, suggesting that these adolescents are withdrawn, timid, and less likely to engage in acting out behaviors. However, moderately elevated Pd scores of high-risk adolescents suggest that the potential for acting out should not be dismissed.

In regard to gender difference, boys at high-risk of internet addiction produced higher scores on A-lse than girls at high-risk, suggesting that high-risk boys seem to have more self-esteem problems such as lacking self-confidence, having little ability, and being likely to yield to pressure from others. Compared to high-risk boys, high-risk girls may have more depressed mood as indicated by significantly lower scores on Ma with elevated D. scores.

It should be kept in mind that this study focused on adolescents who were identified as having a high potential of internet addiction in school settings. Further studies should be aimed at examining the personality factors associated with actual internet addiction of adolescents in various settings including counseling and psychiatric settings. Lastly, longitudinal studies of internet addicts may reveal how internet addition problems of adolescents are related to adulthood life styles.

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인터넷 중독 위험성이 높은 청소년들의 MMPI-A 프로화일

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인터넷 중독은 근래 한국사회에서 심각한 사회 문제들 중의 하나로 부각되었으나 이에 대한 심리학적 연구는 심층적으로 이루어지지 않았다. 본 연구에서는 청소년용 미네소타 다면적 인성검사(MMPI-A)를 이용하여 인터넷 중독 위험성이 높은 청소년들의 심리적 기능상태를 평가하였다. 236명(남106명, 여130명)의 청소년들을 대상으로 Young의 인터넷 중독 평가척도(Internet Addiction Inventory; IAI; 1998)와 MMPI-A를 실시하였다. Young이 제시한 기준에 의거하여 IAI의 총점이 50점 이상일 경우 인터넷 중독 위험성이 높은 집단으로 분류되었고, IAI의 총점이 50점 미만으로서 인터넷 중독 위험성이 낮은 집단을 비교집단으로 선정하였다. 이러한 기준에 의하여 고위험집단은 98명 (남 53명, 여 45명), 저위험집단은 88명(남 36명, 여 52명)으로 구성되었다. 고위험집단의 남, 여학생 모두 저위험집단에 비해 Infrequency(F, F1, F2), D, Pt, Sc, Si 척도 점수가 상승되었고, 여학생 고위험집단의 경우 Hy, Pd, Pa, 척도 점수도 상승되었다. 또한 MMPI-A 내용척도와 부가척도들 중에서는 A-anx, A-obs, A-dep, A-hea, A-cyn, A-aln, A-lse, A-las, A-sod, A-fam, A-sch, A-trt, A, 그리고 IMM과 같은 많은 척도들이 고위험집단에서 점수가 상승된 것으로 나타났다. 인터넷 중독 위험성이 높은 남, 여학생 집단을 비교한 결과, 인터넷 중독 위험성이 높은 남학생들은 A-lse 척도 점수가 유의미하게 높게 나타나 자존감과 관련된 문제를 더 많이 보고하는 것으로 보였다. 여학생 고위험집단에서는 Ma 척도 점수가 유의미하게 낮고 D 척도 점수가 상승되어 여학생들이 우울증적 경향을 더 많이 보고하는 것으로 보였다. 반면 MAC-R, ACK, PRO와 같은 MMPI-A 물질남용장애 척도 점수는 인터넷 중독 고위험집단과 저위험집단간에 차이가 없는 것으로 나타나 MMPI-A 물질남용장애 척도들의 인터넷 중독 평가에 있어서의 유용성과 (필요한 경우) 인터넷 중독 평가를 위한 지표나 새로운 하위척도의 개발에 대한 연구가 필요할 것으로 보인다.

주제어: 인터넷중독, MMPI-A