

# Mental Health, Personality, and Parental Rearing Styles of Adolescents with Internet Addiction Disorder

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## Abstract

The objectives of this study were to compare the personality profiles of adolescent males with and without Internet addiction disorder (IAD), and to determine if IAD is associated with specific parental rearing behaviors. A total of 304 subjects (204 IAD positive and 100 IAD negative controls) completed three instruments: Symptom Checklist-90-revision (SCL-90-R), Eysenck Personality Questionnaire Revised (EPQ-R), and Egna Minnen av Barndoms Uppfostran—My Memories of Upbringing (EMBU). SCL-90-R profiles of adolescents with IAD revealed comparatively higher mean scores for all of the nine domains, and significantly higher scores for obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, and paranoid ideation; the mean global symptom index of adolescents with IAD was also significantly higher by approximately 10%. EPQ profiles of adolescents with IAD showed that Internet-dependent individuals tended to exhibit a significantly lower degree of extraversion and a significantly higher degree of psychoticism when compared with the control group. EMBU profiles revealed that adolescents with IAD generally rated both maternal and paternal rearing practices as lacking in emotional warmth, being over-involved, rejecting, and punitive (mothers only). The results of this study confirm that IAD often occurs concurrently with mental symptoms and personality traits such as introversion and psychoticism. Adolescents with IAD consistently rated parental rearing behaviors as being over-intrusive, punitive, and lacking in responsiveness. These findings suggest that the influences of parenting style and family function are important factors in the development of Internet dependency.

## Introduction

**I**NTERNET ADDICTION DISORDER (IAD) or pathological Internet use, is a compulsive-impulsive spectrum disorder that includes five primary types of addiction: information overload (compulsive web surfing); computer addiction to programming or game playing; compulsions to online auctions; gambling or trading; and cyber-sexual/relationship addictions.<sup>1,2</sup> Conceptually, IAD shares the characteristics of substance dependency (e.g., salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse<sup>3</sup>), and is often similarly predated by and/or accompanied by higher levels of comorbid psychological dysfunctions, such as low self-esteem, depressive moods, compulsiveness, suicidal ideation, and phobic anxiety.<sup>2,4</sup> A broad range of symptom clusters, including alexithymia, dissociative experiences, impulse-control dysregulation, and attention-deficit hyperactivity disorder, has also been found to be associated with an increased risk of preoccupation with the Internet.<sup>5-7</sup>

In addition, certain personality traits such as shyness, introversion, and social withdrawal are closely associated with certain types of IAD, such as computer-game addiction.<sup>8</sup> Aggression, poor self-control, and narcissistic personality traits may predispose some individuals to become addicted to online games.<sup>9</sup>

Elements of family life, such as parenting style and parental attitudes, profoundly affect the psychosocial and personality development of adolescents; broken homes, intra-family conflicts, and permissive or indulgent parenting have been reported to contribute to a higher degree of substance dependency and poorer psychosocial outcomes for children,<sup>10,11</sup> a phenomenon better simplified as “bad” families failing to socialize children effectively and “good” families being more proficient in socializing offspring. It is thus not unexpected that poor family function and intra-family conflicts have been correlated with adolescent IAD.<sup>12</sup> While a few studies evaluating the effects of protective factors such as parental mediation of media and family

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limitations on Internet use do exist, to our knowledge no studies as yet have assessed the role of parenting style as perceived by adolescents with IAD. Thus the objectives of this study were to evaluate the clinical profile and personality traits of adolescents with IAD, and to determine whether Internet dependency was associated with specific parental rearing behaviors.

## Methods

### Participants

A total of 304 subjects were enrolled on this study. From May to December 2005, we recruited 204 subjects diagnosed with IAD at the Addiction Medicine Center, General Hospital of Beijing Military Region. All were addicted to game playing. We then recruited a control group of 100 healthy non-IAD subjects from colleges and high schools located in metropolitan Beijing. Participants were asked to provide demographic information and complete three self-report questionnaires: the Chinese Symptom Checklist-90-Revision (SCL-90-R), the Chinese Eysenck Personality Questionnaire Revised (EPQ-R), and the Chinese Eigna Minnen av Barndoms Uppfostran—My Memories of Upbringing (EMBU) questionnaire.

Diagnostic criteria for IAD, which has been reported in our previous article,<sup>13</sup> include four domains: symptom criteria, severity criteria (functional impairment and loss of psychosocial function), course criteria (duration of Internet addiction must have lasted for 3 months, with at least 6 hours of non-essential Internet usage per day), and exclusion criteria (exclusion of dependency attributed to psychotic disorders). Symptom criteria, which were modified from criteria proposed by Young<sup>1</sup> and Ko et al.,<sup>14</sup> include seven items: (a) preoccupation with the Internet; (b) withdrawal symptoms; (c) tolerance; (d) unsuccessful attempts to control Internet use; (e) continued excessive Internet use despite knowledge of negative psychosocial problems; (f) loss of interests, previous hobbies, entertainment as a result of, and with the exception of, Internet use; (g) use of Internet to escape or relieve a dysphoric mood. A "2+1" rule was employed in which subjects with IAD had to endorse only the first two items (preoccupation and withdrawal) and one or more of the last five items. The diagnostic accuracy rate reached 99.26%, and the diagnostic specificity reached 100%. For the interrater reliability, the consistency rate of any two psychiatrists reached 98.0%.

### Psychometric assessment

**Symptom Checklist-90-Revision.** The SCL-90-R is a widely used self-report symptom inventory designed as a descriptive measure of general symptomatology and psychological distress experienced in the previous seven days.<sup>15</sup> The SCL-90-R contains nine domains: somatization (12 items), obsessive-compulsive (10 items), interpersonal sensitivity (9 items), depression (13 items), anxiety (10 items), hostility (6 items), phobic anxiety (7 items), paranoid ideation (6 items), and psychoticism (10 items) rated on a 5-point Likert scale (1 = never; 5 = very frequently), and includes one global severity index. A higher score represents a greater degree of distress. The Chinese SCL-90-R validated by Zhang was used in this study.<sup>16</sup>

**Eysenck Personality Questionnaire Revised.** The EPQ-R is a widely used self-report measure of personality with dichotomized responses (yes or no), based on a three-factor model including neuroticism (emotional instability, anxiousness), extraversion (sociability, liveliness), psychoticism (aggressiveness, egocentricity), and the lie scale items (unsophisticated dissimulation and social conformity).<sup>17</sup> Higher scores indicate an endorsement of the personality trait represented by the subscale. The modified Chinese EPQ validated by Gong was used in this study.<sup>18</sup>

**Eigna Minnen av Barndoms Uppfostran—My Memories of Upbringing.** The EMBU scale is an 81-item Swedish self-report scale that assesses one's memory of parental rearing,<sup>19</sup> and consists of four replicable dimensions—rejection, emotional warmth, overprotection, and favoritism—reduced from 14 aspects of parental behavior and attitudes: abusive, depriving, punitive, shaming, rejecting, overprotective, overinvolved, tolerant, affectionate, performance oriented, guilt engendering, stimulating, favoring siblings, and favoring subjects. Responses are rated on a 4-point scale Likert scale (0 = never; 4 = always). Cross-cultural stability of the EMBU based on data from Chinese subjects is satisfactory, though favoritism has been identified to be culture-specific.<sup>20,21</sup> The Chinese EMBU scale validated by Wang et al. was used in this study.<sup>22</sup>

### Statistical analysis

Continuous data were given as the mean with standard deviation (SD) and median with interquartile range (IQR). Categorical data were given as frequency and percentage. To evaluate differences between adolescents with and without IAD, continuous variables were evaluated by two-sample *t* tests, and categorical variables were evaluated by Chi-square or Fisher's exact test, wherever appropriate; Mann-Whitney *U* tests were conducted for non-parametric data. All statistical assessments were two-tailed, and  $p < 0.05$  was considered significant. Statistical analyses were performed using SAS statistical software (V9.1.3; SAS Institute, Inc., Cary, NC).

## Results

### Symptom Checklist-90-Revision profiles

Of the 304 respondents, 204 (67.11%) were diagnosed with IAD based on our diagnostic criteria. No significant demographic differences were observed between groups. Respondents were predominantly male adolescent (mean age:  $18.0 \pm 2.7$ ), middle or high school students (Table 1). SCL-90-R profiles of adolescents with IAD revealed a comparatively higher mean score for all of the nine domains and significantly higher scores for obsessive-compulsive ( $1.7 \pm 0.6$  vs.  $1.6 \pm 0.4$ ,  $p = 0.026$ ), interpersonal sensitivity ( $1.7 \pm 0.7$  vs.  $1.6 \pm 0.4$ ,  $p = 0.006$ ), depression ( $1.7 \pm 0.7$  vs.  $1.4 \pm 0.4$ ,  $p < 0.001$ ), anxiety ( $1.5 \pm 0.6$  vs.  $1.4 \pm 0.4$ ,  $p = 0.030$ ), hostility ( $1.7 \pm 0.8$  vs.  $1.4 \pm 0.5$ ,  $p < 0.001$ ), and paranoid ideation ( $1.7 \pm 0.6$  vs.  $1.4 \pm 0.4$ ,  $p < 0.001$ ), indicating a greater degree of distress (Table 2). Mean SCL-90-R GSI scores for adolescents with IAD were significantly higher by approximately 10% ( $p < 0.001$ ), suggesting a greater degree of symptomatology in Internet-dependent adolescents.

TABLE 1. DEMOGRAPHICS OF ADOLESCENTS WITH OR WITHOUT IAD

Demographics	Total (N = 304)	IAD (n = 204)	Non-IAD (n = 100)	Statistic <sup>c</sup>
Age <sup>a</sup>	18.0 ± 2.7	18.1 ± 2.5	17.7 ± 2.9	-1.61
Gender <sup>b</sup>				
Male	285 (93.8%)	193 (94.6%)	92 (92.0%)	0.78
Female	19 (6.2%)	11 (5.4%)	8 (8.0%)	
Level of education <sup>b</sup>				
Junior high school	68 (22.4%)	44 (21.6%)	24 (24.0%)	0.24
Senior high school	172 (56.6%)	117 (57.4%)	55 (55.0%)	
University	64 (21.0%)	43 (21.1%)	21 (21.0%)	
Occupation <sup>b</sup>				
Student	291 (95.7%)	196 (96.1%)	95 (95.0%)	0.19
Non-student	13 (4.3%)	8 (3.9%)	5 (5.0%)	

<sup>a</sup>Continuous data shown as mean ± SD with a two-sample comparison *t* test.

<sup>b</sup>Categorical data shown as *n*(%); Chi-square or Fishers' exact tests were conducted wherever appropriate.

<sup>c</sup>A *t* statistic was determined from two-sample comparison *t* tests for continuous variables, whereas a  $\chi^2$ -statistic was determined from Pearson Chi-square or Fishers' exact test for categorical variables.

### Eysenck Personality Questionnaire profiles

EPQ profiles of adolescents with IAD revealed that Internet-dependent individuals tended to exhibit a significantly lower degree of extraversion ( $48.2 \pm 12.6$  vs.  $61.6 \pm 8.1$ ,  $p < 0.001$ ) and a significantly higher degree of psychoticism ( $51.0 \pm 12.8$  vs.  $45.9 \pm 7.7$ ,  $p < 0.001$ ) when compared with controls (Table 3).

### Egna Minnen av Barndoms Uppfostrans profiles

Table 4 compares the EMBU questionnaire results of parental rearing styles of patients with IAD (IAD group) and without IAD (non-IAD group). For father's rearing style, most domains in the EMBU questionnaire were significantly different between the IAD group and the non-IAD group, except for punishment and overprotection. Emotional

warmth and understanding was higher in the non-IAD group than in the IAD group ( $p < 0.001$ ), whereas over-interference, refusal, and rejection were higher in the IAD group than in the non-IAD group ( $p < 0.001$  for both domains). For mother's rearing style, all domains on the EMBU questionnaire were significantly different between IAD and non-IAD groups. Only the one domain concerning emotional warmth and understanding was lower in the IAD group than in the non-IAD group, but other domains were reversed, indicating that over-interference, refusal, and rejection and punishment were higher in the IAD group than in the non-IAD group ( $p < 0.001$  for all).

### Discussion

The results of this study confirm that IAD often occurs concurrently with mental symptoms and personality traits

TABLE 2. SCL-90-R PROFILES OF ADOLESCENTS WITH OR WITHOUT IAD (N = 304)

SCL-90-R <sup>a</sup>	IAD (n = 204)	Non-IAD (n = 100)	<i>t</i> statistic <sup>b</sup>
Somatization	1.4 ± 0.5 1.2 (1.0, 1.5)	1.3 ± 0.5 1.1 (1.0, 1.3)	-1.89
Obsessive-compulsive	1.7 ± 0.6 1.6 (1.2, 2.1)	1.6 ± 0.4 1.5 (1.3, 1.7)	-2.24*
Interpersonal sensitivity	1.7 ± 0.7 1.6 (1.2, 2.1)	1.6 ± 0.4 1.6 (1.3, 1.8)	-2.75*
Depression	1.7 ± 0.7 1.5 (1.2, 2.0)	1.4 ± 0.4 1.2 (1.1, 1.5)	-4.91**
Anxiety	1.5 ± 0.6 1.3 (1.1, 1.6)	1.4 ± 0.4 1.2 (1.1, 1.5)	-2.19*
Hostility	1.7 ± 0.8 1.5 (1.2, 2.2)	1.4 ± 0.5 1.2 (1.2, 1.5)	-4.74**
Phobic anxiety	1.3 ± 0.5 1.1 (1.0, 1.4)	1.2 ± 0.4 1.0 (1.0, 1.3)	-1.52
Paranoid ideation	1.7 ± 0.6 1.5 (1.2, 2.0)	1.4 ± 0.4 1.3 (1.0, 1.5)	-4.95**
Psychoticism	1.4 ± 0.4 1.3 (1.1, 1.5)	1.3 ± 0.3 1.2 (1.1, 1.5)	-1.62
Global severity index	141.7 ± 45.3 130.5 (108.0, 158.0)	124.8 ± 31.7 118.0 (105.0, 133.0)	-3.76**

<sup>a</sup>Data shown as mean (SD) and median with IQR.

<sup>b</sup>A *t* statistic was determined from a two-sample *t* test.

\* $p < 0.05$ ; \*\* $p < 0.001$  statistical significance, as determined by a two-sample *t* test.

TABLE 3. EPQ PROFILES OF ADOLESCENTS WITH OR WITHOUT IAD (N=304)

EPQ <sup>a</sup>	IAD (n=204)	Non-IAD (n=100)	U statistic <sup>b</sup>
Extraversion	48.2 ± 12.6	61.6 ± 8.1	8.70**
Neuroticism	48.7 (38.7, 58.6)	63.8 (54.7, 67.5)	-0.06
Psychoticism	49.7 ± 12.3	48.1 ± 8.8	-3.65**
Lie	47.5 (39.3, 59.2)	48.0 (43.7, 50.0)	0.61
	51.0 ± 12.8	45.6 (38.8, 49.9)	
	50.0 (42.6, 59.1)	49.2 ± 7.4	
	47.6 ± 15.0	49.6 (42.6, 52.9)	

<sup>a</sup>Data shown as mean (SD) and median with IQR.

<sup>b</sup>A U statistic was determined with a Mann-Whitney U test.

\*\*p < 0.001 statistical significance, as determined by a Mann-Whitney U test.

such as introversion and psychoticism. The Internet provides an anonymous outlet where deficiencies in a user's life such as disabilities, poor family function, lack of sociability, and dissatisfaction with one's appearance may be counteracted. Internet-dependent users often create alternate online personalities that they become emotionally attached to, finding more satisfaction in online relationships than social relationships in the real world.<sup>2,23</sup> Online games, pornography, and gambling provide the pleasures of control and perceived fluidity of identity, and relieve dysphoric moods and negative affects, especially in young male adolescents for whom such activities have a higher behavioral and cognitive salience.<sup>4,24</sup> Without proper restraint and parental mediation of the Internet in the family, most adolescents will have difficulties balancing time spent on online gaming and networking.

Consistent with the findings of Yang et al.<sup>25</sup> who evaluated SCL-90-R profiles of Korean senior high-school students, adolescents with IAD in the present study exhibited subclinical but significantly higher SCL-90-R obsessive-compulsive ( $p = 0.026$ ), depression ( $p < 0.001$ ), hostility ( $p = 0.001$ ), and paranoid ideation ( $p < 0.001$ ) scores and GSIs ( $p = 0.001$ ) on the SCL-90-R when compared with controls. The comparatively high level of mental symptoms in our IAD subjects again reflects the high prevalence of lifetime disorders such as mood disorders, substance use disorders, and psychotic disorders associated with compulsive computer use.<sup>26,27</sup>

The EPQ of Internet-dependent adolescents in the present study indicated that adolescents with IAD tended to be more introverted, antisocial, aggressive, and egocentric. In a study conducted by Black et al.<sup>27</sup> in which the Personality Diagnostic Questionnaire was used to assess Internet-dependent users with axis-II disorders, 52% of the subjects met the criteria for at least one personality disorder, with 24% exhibiting borderline personality disorder, and 19% exhibiting either narcissistic or antisocial personalities. Other personality characteristics associated with Internet dependence include low sensation seeking, loneliness, and interpersonal shyness.<sup>28</sup>

Identity and personality formation during adolescence and other critical transitional periods is profoundly influenced by the dyadic parent-child relationship;<sup>29</sup> when parenting is dysfunctional, internalization and continuity of parental

TABLE 4. EMBU PROFILES OF ADOLESCENTS WITH OR WITHOUT IAD (N=304)

EMBU <sup>a</sup>	IAD (n=204)	Non-IAD (n=100)	U statistic <sup>b</sup>
<i>Father</i>			
Emotional	41.3 ± 15.2	47.9 ± 8.7	3.81**
Warmth	42 (34, 52)	49 (41, 52)	
Punitive	18.8 ± 8.3	17.1 ± 4.5	-1.91
Over-involved	18 (18, 28)	16 (14, 19)	
Rejection	22.2 ± 8.1	19.3 ± 4.4	-5.10**
	23 (18, 28)	18 (16, 21)	
	10.6 ± 4.7	8.7 ± 2.1	-4.68**
	10 (8, 13)	9 (7, 9)	
Overprotection	9.8 ± 3.6	9.9 ± 2.4	-0.10
	10 (8, 12)	10 (8, 11.5)	
<i>Mother</i>			
Emotional	47.3 ± 13.0	52.1 ± 9.0	3.30*
Warmth	47 (38.5, 57)	52 (46, 57)	
Over-involved	40.6 ± 9.3	33.5 ± 5.9	-6.94**
	40 (34, 47)	33 (30, 38)	
Rejection	14.9 ± 5.3	11.5 ± 2.7	-5.52**
	14 (11, 18)	11 (10, 13)	
Punitive	13.8 ± 5.5	10.9 ± 3.2	-4.39**
	12 (10, 16.5)	11 (9, 13)	

<sup>a</sup>Data shown as mean (SD) and median with IQR.

<sup>b</sup>A U statistic was determined with a Mann-Whitney U test.

\*p < 0.05; \*\*p < 0.001 statistical significance, as determined with a Mann-Whitney U test.

values become problematic, and risks of severe psychopathology are increased.<sup>30</sup> Problem behaviors in adolescents, such as substance use, dysfunctional risky behavior, precocious sexual intercourse, and Internet addiction have been associated with lower levels of parental monitoring, lack of discipline in the family, family violence, and/or ineffective parenting style.<sup>9,31,32</sup> Parenting basically falls into two categories: demandingness and responsiveness. Four classical types of parenting style are classified based on this finding: authoritarian (high demandingness, low responsiveness), authoritative (high demandingness, high responsiveness), permissive-indulgent (low demandingness, high responsiveness), and neglectful or uninvolved (low demandingness, low responsiveness).<sup>33</sup> Authoritative parenting, described as being assertive but not intrusive, in contrast to other parenting styles, has been associated with positive psychosocial and academic outcomes and lower degrees of deviance in adolescents.<sup>34</sup> In the context of Internet use, authoritative parenting is described as exhibiting a higher degree of parental mediation (e.g., co-viewing, restricting time limits) of the Internet. That Internet-dependent adolescents in the present study rated both maternal and paternal rearing practices low on emotional warmth (low responsiveness), high on rejection and over-involvement (high demandingness), and high on punishment in the mother's rearing style (authoritarian) when compared to age-equivalent controls, would suggest that authoritarian and neglectful families engaged in punitive practices are more likely to foster Internet dependency. It is clear that parents who are assertive and committed, and whose parenting techniques are supportive and explanative, rather than inexplicable and punitive, are more likely to be

receptive of and responsive to the needs of their children and shield them from compulsive behaviors such as IAD.

Mental health and personality are closely related to parental rearing styles.<sup>35-38</sup> In our clinical practice, we found that parents of Internet-addicted children are overly involved in their children's bodies and daily life. They always satisfy or overindulge children with material needs, expect too much of their children in learning and school performance, and pay little attention to children's inner feelings and emotions. The results of this study also found that the emotional-warmth score was lower and the over-involved score higher in Internet-addicted children's parental rearing styles. Most Internet-addicted children perform poorly in life and human communication. They usually have no interests or hobbies other than learning and become a "learning machine." When the children reach adolescence, with the awakening of self-consciousness and the emergence of rebellious behavior, they begin to confront the parents. They grow tired of learning, and the fictitious world of network games becomes the best place for them to vent their inner dissatisfaction and depression. After indulging in network games for a year or two, children gradually neglect their studies, become alienated from the reality of human relationships, break down the relationship with their parents, and completely isolate themselves from the outside world. Their personality gradually becomes introverted, withdrawn, and aloof. This is consistent with the results of the EPQ personality questionnaire measured in this study, with a lower score in extraversion and a higher score in psychoticism. Their thoughts and behavior demonstrated extreme, even paranoid, characteristics; for example, extreme opposition to the current education system. They believe that they can become professional gamers in the future, unaware that the chances of doing so are slim. They not only have paranoid thinking, but often also demonstrate anxiety and depression. This is also consistent with the results of this study.

The results suggest that inappropriate parental rearing styles are closely related to children's Internet addiction. This could be useful for professionals in helping parents to improve, adjust, and eventually give up improper rearing styles. In this way, their children will grow up in a good environment and develop a sound personality, thus reducing the incidence of Internet addiction.

Adolescents with IAD consistently rated parental rearing behaviors as being over-intrusive, punitive, and lacking in responsiveness. These findings suggest that parenting style influences and family function are important to Internet dependency and that family-based prevention of IAD may be necessary. Increasing parental mediation of the Internet by using evaluative (co-viewing and discussions) and restrictive techniques may be effective in reducing the risk of IAD. Future research topics might include: larger samples to verify these findings; prospective studies to examine the effects of socioeconomic strata, parental attitudes, and family precursors on Internet addiction; and studies on the relationship of different types of IAD to various parental rearing behaviors.

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