Comparison of the personality and other psychological factors of students with internet addiction who do and do not have associated social dysfunction

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**Background:** There is ongoing controversy about whether or not internet addiction should be considered a non-substance behavioral addiction (like gambling disorder) and, if so, what diagnostic criteria should be used to define the condition. Current criteria for internet addiction give equal diagnostic weight to the physiological symptoms and the social consequences of internet addiction.

**Aim:** Assess the psychological correlates of social dysfunction among individuals with internet addiction.

**Methods:** A total of 133 students who sought treatment at the Guangji Psychiatric Hospital from July 2011 to December 2013 for psychological problems related to excessive internet use and who currently met Young criteria for internet addiction were identified; 31 of the 38 students who meet rigorous criteria for concurrent internet-related social dysfunction and a random sample of 44 of the 95 students without concurrent social dysfunction completed a battery of psychosocial measures: seven supplementary scales of the Minnesota Multiphasic Personality Inventory (MMPI), the Egna Minnen av Barndoms Uppfostran perceived parenting scale, the Perceived Social Support Scale, the Trait Coping Style Questionnaire, and the Symptom Checklist 90.

**Results:** Compared to persons with internet addiction without accompanying social dysfunction, those with social dysfunction had higher levels of interpersonal sensitivity, hostility, and paranoia; lower levels of social responsibility, anxiety, self-control, and family social support; and they were more likely to employ negative coping strategies. There were however, no differences in perceived parenting styles between the two groups.

**Conclusions:** A relatively small proportion of individuals who meet the physiological markers of internet addiction simultaneously report significant internet-related social dysfunction. There are several psychosocial measures that distinguish persons with internet addiction who do or do not have concurrent social dysfunction. Further research is needed to determine whether or not these are two distinct subtypes of internet addiction and whether or not persons with internet addiction without concurrent social dysfunction should be classified as suffering from a ‘mental disorder’.

**Keywords:** addictive behavior; internet addiction; social function; mental disorder; students; China

1. **Background**

Various terms have been proposed to describe excessive internet use including ‘internet addiction’, ‘internet dependence’, ‘internet use disorder’, and ‘pathological internet use’, but there is, as yet, no consensus about the operational definition of the condition. In the recently published DSM-5, internet addiction is not listed among the non-substance addictions (a group that currently includes gambling disorder), but ‘internet gambling disorder’ is listed in the appendix as a condition that deserves further study. Classification of a condition as a mental disorder usually requires both the presence of a characteristic set of symptoms and the concurrent occurrence of social dysfunction (or emotional distress) that can be attributed to the symptoms. Thus determining the concurrent presence of social dysfunction in individuals with excessive internet use who meet the physiological symptoms of addiction could potentially differentiate heterogeneous subgroups of excessive internet users, those that do or do not meet criteria of a ‘mental disorder’. Clarifying the social dysfunction component of internet addiction may also help explain the low agreement between different diagnostic scales of internet addiction, a major problem that hampers the advance of the field. The goal of the current paper is to compare the characteristics of individuals who meet symptomatic criteria of internet addiction who do or do not have associated social dysfunction.
2. Methods

2.1 Sample

The enrollment of study participants is shown in Figure 1. All participants were students who sought outpatient services at Guangji Psychiatry Hospital in Suzhou for symptoms associated with excessive internet use (primarily anxiety and sleep disturbances) from July 2011 to December 2013 and who were treated by one of the five authors of this report. A total of 133 students met the cut-off score for ‘internet addiction’ based on the Chinese version of the 8-item, self-completion version of Young’s Diagnostic Questionnaire (YDQ). Among them, 38 (28.6%) were classified as having social dysfunction associated with the internet addiction (defined below) and 95 (71.4%) did not have associated social dysfunction. Students in the two subgroups were stratified by level of education (i.e., high-school, college, and graduate school), and 53 of the 95 students without social dysfunction were randomly selected to match the proportion of students in the three strata among the 38 students with social dysfunction. These students were then independently assessed by two senior psychiatrists to determine whether or not they met exclusion criteria; those with serious physical or neurological conditions or who meet diagnostic criteria of schizophrenia spectrum disorders, mood disorders, anxiety disorders, or substance use disorders were excluded. Students who met inclusion and exclusion criteria were then asked to complete a battery of psychosocial measures. The main analysis compared the characteristics of the 31 students with internet addiction with concurrent social dysfunction who completed the survey with the 44 students with internet addiction who did not have concurrent social dysfunction who completed the survey.

All participants and their guardians signed written consent forms. The current study was approved by the ethics committee of the Guangji Psychiatric Hospital.

2.2 Assessment

2.2.1 Assessment of internet addiction

The 8-item YDQ was used to assess internet addiction. The 8 items are as follows.

1) Do you feel preoccupied with the internet?
2) Do you feel the need to use the internet for increasing amounts of time in order to achieve satisfaction?
3) Have you repeatedly made unsuccessful efforts to control, cut back, or stop internet use?
4) Do you feel restless, moody, depressed, or irritable when attempting to cut down or stop internet use?
5) Do you stay on the internet longer than originally intended?
6) Have you jeopardized or risked the loss of a significant relationship, job, educational opportunity, or career opportunity because of the internet?
7) Have you lied to family members, therapist, or others to conceal the extent of your involvement with the internet?
8) Do you use the internet as a way of escaping from problems or of relieving a dysphoric mood?

Based on the criteria proposed for use in China, internet addiction is considered present if the respondent reports any period of 3 months or longer in the previous year when 5 or more of these symptoms were concurrently present. In the current study all of the enrolled students met these criteria at the time of the interview. A previous study in China found good internal consistency of the 8 items (Cronbach’s alpha=0.82), but compared to a gold standard clinical diagnosis of internet addiction (using the YDQ results...
Based on a psychiatrist’s interview of the subject and the subject’s family members, the sensitivity of the self-completed version of the scale was quite poor (25%).

2.2.2 Assessment of internet-related social dysfunction
Individuals who met the criteria of internet addiction described above were classified as having concurrent internet-related social dysfunction if (a) YDQ item 6 was one of the symptoms they endorsed (“Have you jeopardized or risked the loss of a significant relationship, job, educational opportunity, or career opportunity because of the internet?”) and (b) they were not able to work or attend school due to problems related to internet use for 6 days or more each month for at least 3 months prior to the evaluation.

2.2.3 Assessment of psychosocial characteristics
Basic demographic information was collected using a self-constructed questionnaire. Validated Chinese versions of commonly used western scales were used to assess the psychosocial characteristics of participants. The Symptom Checklist 90 (SCL-90) was used to measure nine classes of psychological symptoms including somatization, obsessive-compulsive symptoms, interpersonal sensitivity, depression, anxiety, hostility, phobia, paranoia, and psychoticism. Supplemental scales of The Minnesota Multiphasic Personality Inventory (MMPI-AF) were used to measure seven specific personality traits previous researchers have identified as related to internet addiction, including ego strength (Es), social status (St), dependency (Dy), dominance (Do), manifested anxiety (MAS), social responsibility (Re), and self-control (Cn). The Trait Coping Style Questionnaire (TCSQ) was used to measure negative coping and positive coping. The 12-item Perceived Social Support Scale (PSSS) was used to measure social support from family members and from non-family members. And the Egna Minnen av Barndoms Uppfostran (EMBU) was used to measure six dimensions of perceived paternal parenting (rejection, over-protection, over-interference, harsh punishment, emotional warmth, and subjective favoring) and five dimensions of perceived maternal parenting (rejection, over-protection and over-interference, harsh punishment, emotional warmth, and subjective favoring). All these questionnaires were self-administered. It took around 90 minutes to complete all the questionnaires.

2.3 Statistical analysis
One-way analysis of variance (ANOVA) and two-sample t-tests were used to compare the characteristics of individuals with internet addiction who did or did not have concurrent internet-related social dysfunction. All analysis was conducted using SPSS 11.0.

3. Results
In the socially dysfunctional group, there were 28 (90.3%) males and 3 (9.7%) females. Their age varied from 18 to 27 years (mean[sd]=21.5[8.1]). Only one person was married (3.3%). In the non-socially dysfunctional group, there were 40 males (90.9%) and 4 females (9.1%). Their age varied from 18 to 30 (mean[sd]=21.8[8.6]). Three people in the non-socially dysfunctional group were married (6.8%). No statistically significant differences were found in terms of sex, age, or marital status between the two groups. None of the participants were using any psychiatric medications.

3.1 Comparison of the psychosocial characteristics of students with internet addiction who do and do not have concurrent social dysfunction
Table 1 shows the results of comparing the various psychosocial instruments. Of the 33 separate measures considered, there were statistically significant differences on 8 measures. Results for the SCL-90 show that compared to students with internet addiction who did not have concurrent social dysfunction, students with internet addiction with concurrent social dysfunction had higher interpersonal sensitivity, greater hostility, and more prominent paranoia. The results for the seven supplemental scales of the MMPI indicated that among students with internet addiction those who had concurrent social dysfunction had lower measures of social responsibility, manifest anxiety, and control than those without concurrent social dysfunction. Students with concurrent internet addiction and social dysfunction reported lower levels of family social support and were more likely to use negative coping strategies than students with internet addiction who did not have concurrent social dysfunction. There were no statistically significant differences in perceived paternal or maternal parenting styles between the two groups of students.

4. Discussion
4.1 Main findings
Some scholars consider internet addiction a non-substance behavioral addiction (like ‘gambling disorder’ that is already a DSM-5 diagnosis) and recommend the combined use of psychotherapy and medications to treat the condition. Excessive use of the internet can result in mood, loss of interest, sleep disturbance, weight loss, lack of vigor, disturbed circadian rhythms, psychomotor retardation, and lack of motivation at work or school. In severe cases, individuals completely give up activities at work or school to use the internet, resulting in serious internet-related social dysfunction. These two classes of symptoms – physiological markers of addiction and social consequences of addictive behavior – are nosologically distinct, but currently available assessment tools for internet addiction list them as equivalent symptoms, failing to recognize that both types of symptoms need to be present to justify labelling a condition as a ‘mental disorder’. In our clinical sample of 133 students who meet the Young criteria for internet addiction, only 38 (28.6%) had significant concurrent internet-related social dysfunction. This suggests that most individuals who
Table 1. Comparison of the mean (sd) scores of different psychosocial measures between students with internet addiction who do and do not have concurrent internet-related social dysfunction

| subscale                                      | internet addiction with social dysfunction (n=31) | internet addiction without social dysfunction (n=44) | F    | p   |
|-----------------------------------------------|--------------------------------------------------|---------------------------------------------------|------|-----|
| **Symptom Checklist 90 (SCL-90)**             |                                                  |                                                   |      |     |
| Total score                                   | 1.82 (0.55)                                      | 1.43 (0.41)                                       | 1.80 | 0.076 |
| somatization                                  | 1.76 (0.63)                                      | 1.66 (0.49)                                       | 1.65 | 0.129 |
| obsessive-compulsive                          | 1.52 (0.69)                                      | 1.55 (0.55)                                       | 1.57 | 0.170 |
| interpersonal sensitivity                     | 2.06 (0.76)                                      | 1.56 (0.52)                                       | 2.14 | 0.022 |
| depression                                    | 1.77 (0.77)                                      | 1.61 (0.80)                                       | 1.08 | 0.838 |
| anxiety                                       | 1.53 (0.49)                                      | 1.66 (0.48)                                       | 1.04 | 0.887 |
| hostility                                      | 1.91 (0.68)                                      | 1.57 (0.46)                                       | 2.19 | 0.019 |
| phobia                                        | 1.51 (0.44)                                      | 1.63 (0.54)                                       | 1.51 | 0.242 |
| paranoid                                       | 1.84 (0.61)                                      | 1.53 (0.44)                                       | 1.92 | 0.049 |
| psychotic symptoms                            | 1.38 (0.45)                                      | 1.43 (0.51)                                       | 1.82 | 0.087 |
| **Supplemental scales of Minnesota Multiphasic Personality Inventory** |                                                  |                                                   |      |     |
| social status (St)                            | 39.50 (4.36)                                     | 38.87 (4.17)                                      | 1.09 | 0.777 |
| ego strength (Es)                             | 31.91 (3.22)                                     | 32.91 (4.23)                                      | 1.73 | 0.120 |
| dependency (Dy)                               | 47.42 (7.77)                                     | 53.14 (8.58)                                      | 1.22 | 0.574 |
| dominance (Do)                                | 43.82 (11.16)                                    | 46.73 (11.64)                                     | 1.09 | 0.820 |
| social responsibility (Re)                    | 39.11 (15.64)                                    | 51.07 (10.12)                                     | 2.39 | 0.009 |
| manifested anxiety (MAS)                      | 40.14 (8.03)                                     | 49.88 (11.40)                                     | 2.02 | 0.047 |
| self-control (Cn)                             | 48.08 (9.18)                                     | 58.99 (13.16)                                     | 2.06 | 0.041 |
| **Perceived Social Support Scale**            |                                                  |                                                   |      |     |
| Total score                                   | 57.13 (14.97)                                    | 60.58 (13.81)                                     | 1.18 | 0.618 |
| family-support score                          | 32.90 (10.50)                                    | 43.36 (7.52)                                      | 1.95 | 0.044 |
| non-family support score                      | 42.85 (6.11)                                     | 43.37 (5.88)                                      | 1.08 | 0.805 |
| **Trait Coping Style Questionnaire**          |                                                  |                                                   |      |     |
| negative coping                               | 45.90 (7.22)                                     | 34.17 (5.18)                                      | 1.94 | 0.045 |
| positive coping                               | 33.31 (4.91)                                     | 35.63 (6.73)                                      | 1.88 | 0.073 |
| **Egna Minnen av Barndoms Uppfostran perceived parenting scale** |                                                  |                                                   |      |     |
| paternal warmth                               | 48.31 (10.05)                                    | 51.79 (9.35)                                      | 1.16 | 0.654 |
| paternal over-interference                    | 19.80 (5.62)                                     | 20.36 (4.58)                                      | 1.51 | 0.215 |
| paternal favoring                             | 11.68 (3.23)                                     | 11.51 (4.41)                                      | 1.86 | 0.076 |
| paternal rejection                            | 9.89 (3.09)                                      | 9.08 (2.99)                                       | 1.07 | 0.830 |
| paternal over-protection                      | 12.84 (3.28)                                     | 13.55 (4.41)                                      | 1.83 | 0.085 |
| paternal harsh punishment                     | 15.08 (5.26)                                     | 16.03 (7.33)                                      | 1.94 | 0.059 |
| maternal warmth                               | 51.11 (12.54)                                    | 54.78 (9.45)                                      | 1.76 | 0.088 |
| maternal over-interference                    | 33.66 (8.14)                                     | 34.14 (6.58)                                      | 1.53 | 0.198 |
| maternal rejection                            | 14.10 (4.67)                                     | 13.56 (4.56)                                      | 1.04 | 0.872 |
| maternal favoring                             | 15.90 (3.05)                                     | 14.04 (3.71)                                      | 1.48 | 0.263 |
| maternal harsh punishment                     | 13.94 (5.55)                                     | 12.68 (5.42)                                      | 1.05 | 0.873 |
meet the physiological criteria for addictive internet use do not meet the social dysfunction criteria that would justify classifying this behavior as a mental disorder. Apparently, some individuals can fulfill their social obligations (e.g., work or study) despite their excessive use of the internet while others cannot. Further work is needed to determine whether or not our results identify the existence of two distinct subgroups of persons with internet addiction or are simply an arbitrary division of persons with internet addiction into those who are above or below the cutoff we defined for ‘social dysfunction’ (i.e., those who report serious social consequences and inability to undertake normal activities for at least 6 days each month for 3 or months due to excessive internet use). Some scholars suggest that lack of self-control or effective coping strategies are the core psychological deficits that increase the risk of internet addiction. This line of reasoning hypothesizes that individuals with poor social skills feel more comfortable in the virtual world of the internet where the wide range of information can meet their needs for novelty without requiring negotiating complicated interpersonal relationships. Our findings advance this theory somewhat by considering the personality characteristics of persons with internet addiction who do and do not have concurrent social dysfunction. We find that persons with internet addiction who have concurrent social dysfunction are, indeed, more likely to be hypersensitive, to have weaker self-control, and to be more likely to report using negative coping strategies. We also found that higher levels of manifest anxiety were associated with less internet-related social dysfunction, suggesting that anxiety protects the integrity of social functioning in individuals who have excessive internet use. Similar to the work by Kraut and colleagues who found that internet use positively influenced those who were more extroverted or had higher levels of social support but negatively affected those who were introverted or lack social support, we found that persons with internet addiction who had concurrent social dysfunction were more likely to report lower levels of family social support.

This is, however, a cross-sectional study so it is not possible to determine whether these personality traits pre-existed internet addiction or were magnified by the internet addiction. Resolving this important ‘chicken and egg’ issue has important clinical implications. If these pre-existing personality traits increase the likelihood of social dysfunction in persons who excessively use the internet, training individuals who excessively use the internet (e.g., students) in self-control and in the use of positive coping skills might reduce the prevalence and severity of internet addiction. If, however, internet addiction happens first and these less-functional behavioral traits are exacerbated by excessive internet use, then the focus of preventive efforts need to be on reducing excessive internet use rather than on changing the self-control and coping skills employed by individuals with high internet use. Long-term prospective studies are needed to resolve this issue.

4.2 Limitations
This study used a treatment-seeking sample of students who meet Young criteria of internet addiction. Thus the results may not be representative of individuals with internet addiction who do not seek treatment (presumably, the majority of such individuals) or of non-students with internet addiction. The Young criteria of internet addiction have been widely used in China and elsewhere, but there are still questions about their validity and reliability, questions that will not be resolved until there is professional consensus about the operational criteria (i.e., ‘gold standard criteria’) for the condition. The dichotomous classification of ‘concurrent social dysfunction’ was arbitrarily set at a relatively severe level (missing 6 days or more of work or school per month for 3 months due to excessive internet use); this method may have been less sensitive than a multiple-level or continuous measure of social dysfunction. And the study did not collect information about the duration of internet addiction or about participants’ main online activities (e.g., online gaming or social networking), potential confounding factors that could affect the relationship between internet addiction and social functioning. Finally, the cross-sectional nature of the study made it impossible to assess the cause-effect relationships between the different factors considered.

4.3 Implications
Only a minority of individuals who meet the physiological criteria of internet addiction have concurrent social dysfunction that would justify classifying the condition as a ‘mental disorder’. There are several personality traits and psychological factors associated with social dysfunction among individuals who meet current criteria of internet addiction, but further prospective studies will be needed to determine whether these characteristics magnify social dysfunction in persons with excessive internet use or become more prominent in individuals after they develop concurrent internet addiction and social dysfunction.

Conflict of interest
The authors declare no conflict of interest related to this manuscript.

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Ethics approval
The study was approved by the ethics committee at Suzhou Guangji Hospital.

Informed consent
All participants or their guardians signed informed consent forms to participate in the study.
伴有相关社会功能受损与未受损的网络成瘾学生的人格和其他心理因素的比较

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背景：网络成瘾是否应该像赌博障碍一样被作为一种非物质相关的行为成瘾，一直以来备受争论。如果这是一种行为成瘾，那么应该用什么诊断标准来定义这一成瘾。现有的网络成瘾诊断标准中生理症状和社会功能受损有共同的诊断权重。

目的：评估在网络成瘾者中与社会功能受损相关的心理因素。

方法：广济医院从2011年7月至2013年12月接诊了因过度使用互联网产生心理问题并符合杨氏网络成瘾诊断标准的学生共133名。在符合网络成瘾社会功能受损严格标准的38名学生中，有31名完成了整套心理测评，在社会功能未受损的95名学生中随机抽取的44名也完成了心理测评。整套测评包括明尼苏达多相调查表(MMPI)中的7个附加量表、父母教养方式评价量表、应对方式问卷以及90项症状自评量表。

结果：相较于社会功能未受损者，那些社会功能受损的网络成瘾学生人际关系敏感、敌对和偏执的程度要高，而社会责任感较弱，焦虑水平低，自我控制较差，家庭社会支持较弱，更可能采用消极的应对策略。然而，这两组学生的父母教养方式没有显著差异。

结论：符合网络成瘾的诊断标准的人群中，有一小部分报告同时存在使用网络相关的社会功能受损。一些心理社会测量工具可以区分网络成瘾者的社会功能是否受损。需要进一步的研究以确定社会功能受损或未受损是否为网络成瘾的两种不同亚型，并确定社会功能未受损的网络成瘾者是否应该被归为患有“精神障碍”。

关键词：成瘾行为；互联网；社会功能；精神障碍；学生；中国

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