

Internet addiction among Chinese adolescents: prevalence and psychological features

F. Cao and L. Su

Department of Psychiatry, The Second Xiangya Hospital, Central South University, Changsha, Hunan Province, China

Accepted for publication 26 September 2006

Keywords

addictive, adolescent, behaviour, disorders of environmental origin, Internet

Correspondence:

Linyan Su, Department of Psychiatry, The Second Xiangya Hospital, Central South University, no. 139 Renmin Road, Changsha, Hunan Province 410011, China
E-mail: caofenglin@gmail.com; caofenglin2008@yahoo.com.cn

Fenglin Cao is a student for Doctor's degree in Department of Psychiatry, The Second Xiangya Hospital, Central South University. Linyan Su is president of Chinese Association for Child Mental Health and a psychiatrist. The work has not been published and is not being considered for publication elsewhere.

Abstract

Background To investigate the prevalence of Internet addiction among Chinese adolescents and to explore the psychological features associated with Internet addiction.

Methods A total of 2620 high school students from four high schools in Changsha City were surveyed using Diagnostic Questionnaire for Internet Addiction (YDQ), Eysenck Personality Questionnaire (the edition for children, EPQ), Time Management Disposition Scale (TMDS) and Strengths and Difficulties Questionnaire (SDQ). The mean age of whole sample was 15.19 years (ranging from 12 years to 18 years). According to the modified YDQ criteria by Beard, 64 students who were diagnosed as Internet addiction (the mean age: 14.59 years) and 64 who were diagnosed as being normal in Internet usage (the mean age: 14.81 years) were included in a case-control study.

Results The rate of Internet use among the surveyed adolescents was 88%, among which the incidence rate of Internet addiction was 2.4%. The Internet addiction group had significantly higher scores on the EPQ subscales of neuroticism, psychoticism, and lie than the control group ($P < 0.05$). The Internet addiction group scored lower than the control group on the TMDS subscales of sense of control over time, sense of value of time, and sense of time efficacy ($P < 0.05$). Compared with the control group, the Internet addiction group had also significantly higher scores on the SDQ subscales of emotional symptoms, conduct problems, hyperactivity, total difficulties and lower scores on the subscale of prosocial behaviours ($P < 0.05$).

Conclusions The present study suggests that Internet addiction is not rare among Chinese adolescents. In addition, adolescents with Internet addiction possess different psychological features when compared with those who use the Internet less frequently.

Introduction

The use of the Internet has increased considerably over the last few years. Data from the China Internet Network Information Center, as of 30 June 2005, showed that 103 million people had gone online, of which 15.8% were teenagers below 18 years old. With this soaring number of Internet users, the problem of Internet addiction has attracted high attention from psychiatrists, educators and the public. Internet addiction is currently

becoming a serious mental health problem among Chinese adolescents. Chou and Hsiao (2000) reported that the incidence rate of Internet addiction among Taiwan college students was 5.9%. Wu and Zhu (2004) identified 10.6% of Chinese college students as Internet addicts.

Internet addiction, also described as pathological Internet use, is defined as an individual's inability to control his or her use of the Internet, which eventually causes psychological, social, school and/or work difficulties in a person's life (Young

& Rogers 1998; Davis 2001). The description of Internet addiction has been based on the definition for substance dependence or pathological gambling. It shares characteristics like preoccupation, mood modification, tolerance, withdrawal and functional impairment (Hall & Parsons 2001; Leung 2004).

Like other addictions, furthermore, Internet addiction has been linked to a variety of problems. Besides little sleep, failure to eat for long periods and limited physical activity, it also disrupts the studies, work and other aspects of the daily life of an individual. In Young's (1996) study, dependent Internet users reported that excessive use of the Internet resulted in personal, family and occupational problems. Chou and Hsiao (2000) investigated college students' self-assessment of their Internet use and its impact on their lives. They found that students with Internet addiction reported more negative consequences on their studies and daily routines than did those without Internet addiction.

Noticeably, Internet addiction is also a problem that has been observed in different cultures. Yoo and colleagues (2004) conducted a study in which 535 Korean children were assessed. This study found significant associations between attention deficit hyperactivity disorder symptoms and the severity of Internet addiction. A survey carried out by Morahan-Martin and Schumacher (2000) among 277 US college students reported that pathological Internet users were more likely to be males and to use online games as well as technologically sophisticated sites. With a Chinese Internet-Related Addictive Behaviour Inventory (IRABI) version and Diagnostic Questionnaire for Internet Addiction (YDQ), Chou and Hsiao (2000) explored Internet addiction in 910 Taiwanese college students and identified the high communication pleasure score as a high predictor for Internet dependence. Among Australian college students, Internet dependency appears to be independent of the students' psychosocial maturity and general self-efficacy (Wang 2001).

Since the initial recognition of Internet addiction, several assessment instruments have been developed. Brenner (1997) developed an IRABI, which has 32 true-false questions that assess users' Internet experiences. Morahan-Martin and Schumacher (2000) introduced their scale, Pathological Internet Use Scale (PIUS), with 13 questions to assess whether heavy Internet use negatively affects academic and other work, interpersonal relations, individual stress levels, social withdrawal and mood alteration. This scale also demonstrates a high internal reliability (the Cronbach's alpha is 0.876). In 2002, Caplan (2002) published the Generalized Problematic Internet Use Scale (GPIUS), a preliminary study of which indicated that the GPIUS was both reliable and valid and the factor analysis identified seven sub-dimensions, including mood alteration,

perceived social benefits available online, negative outcomes associated with Internet use, compulsive Internet use, excessive amounts of time spent online, withdrawal symptoms and perceived social control available online. In addition, a widely used eight-item YDQ was developed by Young (1996), partly adapted from Diagnostic and Statistical Manual (DSM)-IV criteria for pathological gambling. Young asserted that five or more yes responses to the eight questions indicated a dependent user. Later, Beard and Wolf (2001) modified the YDQ criteria and according to the revised criteria, respondents were considered 'addicted' when answering 'yes' to questions 1 through 5 and any one of the remaining three questions. Beard stated that the modification may help strengthen Young's proposed criteria. The YDQ revealed a good reliability and consistency (Johansson & Götestam 2004). Young also created a 20-item questionnaire, called the Internet Addiction Test (IAT) (Beard 2005). Up to now, there exists yet no Internet addiction diagnosis in the DSM system.

The aim of the present study is to investigate the prevalence of Internet addiction among adolescents in China, and, moreover, to explore the psychological features of Internet addiction.

Method

Sample

The high schools in China are usually classified into two types: regular high schools and key high schools (the key high schools have better teaching resources like school faculties and equipment than those in the regular high schools). From each type, two high schools were selected randomly in Changsha City (a mid-sized city located in the central south part of China). In all four schools, we then adopted a two-stage sampling method to select three classes respectively from four grades, namely, first grade (the mean age: 13.07 years) and second grade (the mean age: 14.34 years) in junior high schools and first grade (the mean age: 16.47 years) and second grade (the mean age: 17.07 years) in senior high schools. From the selected classes, all students (a total of 2787 students) participated in this study and completed the self-report questionnaires in class after the researchers had explained the procedures and requirements. Questionnaires were collected immediately after they were completed. The SDQ questionnaire was distributed by the teachers to the students to bring home for their parents to complete. They were collected a week following the distribution of the questionnaires. A final 2620 eligible questionnaires remained. The response rate was 94%. A summary of the participant characteristics is shown in Table 1.

Table 1. Age and gender distribution of subjects

Grade	Age (years)	Male students <i>n</i> (%)	Female students <i>n</i> (%)	Total <i>n</i> (%)
Grade 1 of junior high school	12–14	376 (54.1)	319 (45.9)	695 (26.5)
Grade 2 of junior high school	13–15	325 (51.3)	308 (48.7)	633 (24.2)
Grade 1 of senior high school	15–17	296 (45.5)	355 (54.5)	651 (24.8)
Grade 2 of senior high school	16–18	319 (49.8)	322 (50.2)	641 (24.5)
Total	12–18	1316 (50.2)	1304 (49.8)	2620 (100.0)

School approval and parental consent were obtained before participation in the study. Investigators visited schools, explained the purpose of the study to students and teachers and also informed the parents of the objective of the study, a guarantee of confidentiality, a contact telephone number of the prime investigator for any questions and concerns by sending a letter. All parents were assured that they were free to refuse if they did not agree with the objective of the study.

Group selection

According to modified YDQ criteria by Beard, 64 participants met the criteria for Internet addiction. In total, 64 participants who were diagnosed as being normal in Internet usage were matched by gender, age and educational levels and were included in the control group. Independent *t*-tests showed that age and educational levels did not differ between the groups ($P > 0.05$). Chi-squared test indicated no differences between Internet addiction group and the control group in distribution of gender ($P > 0.05$).

Instruments

Basic Information Questionnaire was used to collect demographic information such as gender, age, year in high school and average weekly hours spent online.

Diagnostic Questionnaire for Internet Addiction was adapted from DSM-IV criteria for pathological gambling by Young (1996). YDQ consisting of eight 'yes' or 'no' questions was translated into Chinese. It includes the following questions: (1) Do you feel preoccupied with the Internet (think about previous online activity or anticipate next online session)? (2) Do you feel the need to use the Internet with increasing amount 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 online longer than originally intended? (6) Have you jeop-

ardized or risked the loss of significant relationship, job, educational or career opportunity because of the Internet? (7) Have you lied to family members, therapist or others to conceal the extent of involvement with the Internet? (8) Do you use the Internet as a way of escaping from problems or of relieving a dysphoric mood (e.g. feelings of helplessness, guilt, anxiety or depression)? Young asserted that five or more 'yes' responses to the eight questions indicate a dependent user. Later, Beard and Wolf (2001) modified the YDQ criteria. Respondents who answered 'yes' to questions 1 through 5 and at least any one of the remaining three questions were classified as suffering from Internet addiction. In previous publications about YDQ, the split-half reliability was 0.729 and the Cronbach's alpha was 0.713 (Johansson & Götestam 2004). In our study, Cronbach's alpha of YDQ was 0.722. We chose the modified YDQ by Beard as the eight clinical symptoms of YDQ to assess Internet addiction paralleled to the symptoms of substance abuse and pathological gambling, and it had a good reliability and consistency.

We used an adapted version of the Eysenck Personality Questionnaire (the edition for children, EPQ) as an assessment instrument for personality, which consists of 88 items that are under four subcategory scales, including neuroticism, extraversion/introversion, psychoticism and lie (Gong 1984).

Time Management Disposition Scale (TMDS) was designed by Huang and Zhang (2001) to measure the time management disposition of adolescents. TMDS consists of 44 items (Each item has five possible answers, each of which is assigned a value 1, 2, 3, 4 or 5.) and can be divided into three subscales to measure the subjects' sense of control over time, sense of value of time and sense of time efficacy. Huang and Zhang (2001) regarded TMDS as a highly reliable and internally consistent measure. It had good content validity and construct validity as well.

Strengths and Difficulties Questionnaire (SDQ) was designed by Goodman (1997) and comprised 25 items: 10 strengths, 14 difficulties and one neutral item. The 25 items are divided into five scales of five items each: hyperactivity, emotional symptoms, conduct problems, peer problems and prosocial behav-

four. Each item has three possible answers, each of which is assigned a value 0, 1 or 2. The score for each scale is generated by adding up the scores on the five items within that scale, producing scale scores ranging from 0 to 10. A total difficulties score is derived by adding the scores of each of the scales, except the prosocial behaviour scale, producing a total score ranging from 0 to 40. The SDQ total difficulties score used a cut-off score of 13 for the normal band, 14–16 for the orderline band and 17–40 for the abnormal band (Goodman 1997, 2001). The psychometric properties of the Chinese version of the SDQ have been described as satisfactory elsewhere (Kou *et al.* 2005). In the current study, we used parent SDQ version to assess psychological morbidity.

Statistical analysis

We used the *t*-test to evaluate the association between psychological features and Internet addiction. Statistical significance was set at $P < 0.05$. The data were analysed with SPSS version 10.0 software.

Results

Prevalence

Of the 2620 participants (the mean age was 15.19 years) who fully completed the survey, 2315 (88%) reported ever using the Internet and 64 participants (2.4%) met the criteria for Internet addiction. The 64 participants with Internet addiction comprised 53 male students (83%) and 11 (17%) female students.

Length of Internet use

Average weekly hours of Internet use was 3.8 h, SD 5.8, for the whole sample, 11.1 h, SD 8.6, for Internet addiction group and 3.1 h, SD 4.9, for the control group. Results indicated significant differences between Internet addiction group and control group ($t = 8.84$, $P < 0.05$).

Comparison of average EPQ scores by groups

Table 2 shows that the Internet addiction group had significantly higher neuroticism, psychoticism and lie scores than the control group ($P < 0.05$). The scores regarding extraversion/introversion did not differ between the groups ($t = 0.16$, $P > 0.05$).

Comparison of average TMDS scores by groups

As can be seen in Table 3, compared with the control group, the Internet addiction group had a significantly lower overall TMDS score as well as all sub-factor scores ($P < 0.05$).

Comparison of average SDQ scores by groups

A comparison of average SDQ scores by Internet addiction group and control group is shown in Table 4. Compared with the control group, we observed significantly higher emotional symptom, conduct problem, hyperactivity and overall total difficulty scores for Internet addiction group ($P < 0.05$). The Internet addiction group also had a significantly lower score

Table 2. Difference between Internet addiction group and the control group on Eysenck Personality Questionnaire (mean \pm SD)

Variables	Internet addiction group (<i>n</i> = 64)	Control group (<i>n</i> = 64)	<i>t</i>	<i>P</i>
Extraversion/introversion	17.20 \pm 5.31	17.34 \pm 4.77	0.16	>0.05
Psychoticism	6.09 \pm 2.94	3.66 \pm 2.33	5.21	<0.05
Neuroticism	14.69 \pm 6.08	9.39 \pm 5.73	5.07	<0.05
Lie	8.38 \pm 3.44	11.77 \pm 4.87	4.55	<0.05

Table 3. Difference between Internet addiction group and the control group on Time Management Disposition Scale (mean \pm SD)

Variables	Internet addiction group (<i>n</i> = 64)	Control group (<i>n</i> = 64)	<i>t</i>	<i>P</i>
Sense of time control	64.83 \pm 14.74	76.06 \pm 16.23	4.10	<0.05
Sense of time efficacy	29.53 \pm 6.53	35.19 \pm 7.11	4.69	<0.05
Sense of time value	35.33 \pm 7.91	38.77 \pm 7.86	2.47	<0.05
Total score	129.69 \pm 25.25	150.02 \pm 28.54	4.27	<0.05

Table 4. Difference between Internet addiction group and the control on parent-related Strengths and Difficulties Questionnaire scores of the child (mean \pm SD)

Variables	Internet addiction group (n = 64)	Control group (n = 64)	t	P
Emotional symptoms	2.58 \pm 2.51	1.75 \pm 1.82	2.45	<0.05
Conduct problems	2.44 \pm 1.60	1.62 \pm 1.30	3.16	<0.05
Hyperactivity	5.52 \pm 2.13	4.14 \pm 2.12	3.66	<0.05
Peer problems	2.98 \pm 1.71	2.53 \pm 1.67	1.52	>0.05
Total difficulties	13.52 \pm 5.11	10.08 \pm 4.59	3.99	<0.05
Prosocial behaviours	5.58 \pm 1.95	6.70 \pm 1.97	3.24	<0.05

in pro-social behaviours than the control group did ($P < 0.05$).

Discussion

This study primarily focused on exploring prevalence and psychological features of Chinese adolescents with Internet addiction. Our results indicate that some adolescents use the Internet excessively, and a total of 2.4% could be described to suffer from 'Internet addiction'. Owing to the different sample, different social and cultural contexts, and also the rigid modified YDQ criteria by Beard we used, it is difficult to compare the findings effectively. Nonetheless, the Internet addiction percentage varied considerably. Using PIUS, Morahan-Martin and Schumacher (2000) found that 8.1% of the US college students they surveyed had four or more symptoms on pathological Internet use. Yang and colleagues (2005) identified 4.9% of Korean senior high school students as Internet excessive users according to IAT criteria. Johansson and Göttestam (2004) also reported that the incidence rate of Internet addiction among Norwegian youth was 1.98% (five criteria according to YDQ).

In our study, the male-to-female ratio for Internet addiction students of 4.8:1 (53 males and 11 females) is similar to other study which found 3.8:1 of male-to-female ratio (Morahan-Martin & Schumacher 2000) and may indicate a gender difference in Internet addiction.

The EPQ results indicated that the Internet addiction group has higher scores in neuroticism and psychoticism temperament categories than those of the control group, suggesting that children with high scores in these two temperament categories may be more likely to exhibit Internet addiction behaviours than their peers. Given that higher scores in the Lie category may be interpreted as a certain degree of maturity, and may be beneficial for the development of conduct, the Internet addiction group scored lower in the Lie dimension than the control group did, suggesting that children who are less mature may be more inclined to become Internet addicts. Similar research in

other countries has also pointed out this linkage. For instance, Yang and colleagues (2005) investigated personality characteristics of Korean senior high school students with Internet addiction using 16-PF. The result revealed that the students with Internet addiction were easily affected by feeling, emotionally less stable, imaginative, absorbed in thought, self-sufficient, experimenting and preferred their own decisions.

The total TMDS score reflects the overall level of individual time management ability. An individual's sense of control over time reflects a person's concept and ability to use and manage time. The sense of time efficacy reflects an individual's confidence in time management and his or her own time management conduct ability estimation. The sense of time value reflects an individual's stable concept and attitude towards the value and function of time. The students with Internet addiction scored lower in the total and each subcategory in TMDS, indicating that in comparison to their peers, the students with Internet addiction have less ability in overall time management and in each subcategory time management disposition. Consequently, Internet addicts' weaker sense of time management may lead to their weaknesses in planning for study and daily life, time monitoring and self-management. On the other hand, this weak time management ability may also result in inefficient time allocation and can therefore cause more emotional and psychological problems in adolescents (Huang & Zhang 2001).

In addition, for the Internet addiction group, SDQ yielded higher difficulty total scores and emotional, conduct and hyperactivity-inattention scores than those of the control group, while the pro-social score was lower than that of the control group. Although the average score on the total difficulties score reported by students with Internet addiction was not high enough to indicate a significant abnormality, the results themselves are important because students with Internet addiction revealed more psychiatric symptoms than control group did. These results indicate that Internet addiction is associated with behavioural and emotional problems experienced by the students with Internet addiction. We speculate that the association

we observed may be due to several reasons. First, Internet addiction students may already have more behavioural or emotional problems in their daily lives than the control group. For example, they may have conduct, hyperactivity and concentration problems, and are hence often criticized by parents and teachers, and seldom get approval from them. Such tendencies may stimulate these students to use the Internet as a way to vent their anger and feel a sense of achievement. Also, through Internet games and Internet chat rooms, these students can obtain a sense of self-satisfaction. Second, students who have conduct and hyperactivity-inattention problems may also be more impulsive than those in the control groups. This difficulty with self-control may in part explain why once they start using the Internet, they may be more likely addicted to Internet usage than their control group. Similar research in other counties has highlighted this phenomenon as well. For example, Whang and colleagues (2003) reported that Internet addiction group had higher degree of loneliness and depressed mood compared with the non-addicts group. A recent study by Yoo and colleagues (2004) also considered hyperactivity and attention deficit disorder symptoms as risk factors associated with Internet addiction.

Several limitations should be considered in this study: first, we used a questionnaire method rather than a direct, in-depth interview. Second, the diagnosis of Internet addiction needs to be refined to improve the reliability and validity. Third, most importantly, as a cross-sectional study, our results do not clearly indicate whether the psychological characteristics in this study preceded the development of Internet addiction behaviour or were a consequence of Internet use. Future studies should attempt to determine the predictive factors by identifying the causal relations between Internet addiction and the psychological characteristics of adolescents. This appears to be a subject that warrants further in-depth study.

In conclusion, our study suggests that incidence of Internet addiction is not rare in Chinese adolescents. Specifically, adolescent males are more likely than females to be Internet addicts. In addition, compared with students who use the Internet less frequently, adolescents with Internet addiction embody different psychological features.

Acknowledgements

The authors thank Xue-Ping Gao, Han-Shi Xiao, Yao-Guo Geng, Qiao-Rong Su, Fei Li of Department of Psychiatry of the Second Xiangya Hospital, Central South University, Changsha, Hunan Province, People's Republic of China for performing the study. This work was supported by grants from National Natural

Science Foundation of China (30370521) and National Natural science Foundation of China (30570659).

References

- Beard, K. W. (2005) Internet addiction: a review of current assessment techniques and potential assessment questions. *Cyberpsychology and Behavior*, *8*, 7–14.
- Beard, K. W. & Wolf, E. M. (2001) Modification in the proposed diagnostic criteria for Internet addiction. *Cyberpsychology and Behavior*, *4*, 377–383.
- Brenner, V. (1997) Psychology of computer use: XLVII. Parameters of Internet use, abuse and addiction: the first 90 days of the Internet usage survey. *Psychological Reports*, *80*, 879–882.
- Caplan, S. E. (2002) Problematic Internet use and psychosocial well-being: development of a theory based cognitive-behavioral measurement instrument. *Computers in Human Behavior*, *18*, 553–575.
- Chou, C. & Hsiao, M. C. (2000) Internet addiction, usage, gratification, and pleasure experience: the Taiwan college students' case. *Computers and Education*, *35*, 65–80.
- Davis, R. A. (2001) A cognitive-behavioral model of pathological Internet use. *Computers in Human Behavior*, *17*, 187–195.
- Gong, Y. X. (1984) The revision of Eysenck Personality Questionnaire in China. *Psychological Science Newsletter*, *4*, 11–18.
- Goodman, R. (1997) The strengths and difficulties questionnaire: a research note. *Journal of Child Psychology and Psychiatry*, *38*, 581–586.
- Goodman, R. (2001) Psychometric properties of the strengths and difficulties questionnaire. *Journal of the American Academy of Child and Adolescent Psychiatry*, *40*, 1337–1345.
- Hall, A. S. & Parsons, J. (2001) Internet addiction: college student case study using best practices in cognitive behavior therapy. *Journal of Mental Health Counseling*, *23*, 312–327.
- Huang, X. T. & Zhang, Z. (2001) The compiling of adolescence time management disposition inventory. *Acta Psychologica Sinica*, *33*, 338–343.
- Johansson, A. & Götestam, K. G. (2004) Internet addiction: characteristics of a questionnaire and prevalence in Norwegian youth (12–18 years). *Scandinavian Journal of Psychology*, *45*, 223–229.
- Kou, J., Du, Y. S. & Xia, L. M. (2005) Reliability and validity of 'children strengths and difficulties questionnaire' in Shanghai norm. *Shanghai Archives of Psychiatry*, *17*, 25–28.
- Leung, L. (2004) Net-generation attributes and seductive properties of the Internet as predictors of online activities and Internet addiction. *Cyberpsychology and Behavior*, *7*, 333–348.
- Morahan-Martin, J. & Schumacher, P. (2000) Incidence and correlates of pathological Internet use among college students. *Computers in Human Behavior*, *16*, 13–29.
- Wang, W. (2001) Internet dependency and psychosocial maturity among college students. *International Journal of Human-Computer Studies*, *55*, 919–938.

- Whang, L. S., Lee, S. & Chang, G. (2003) Internet over-users' psychological profiles: a behavior sampling analysis on internet addiction. *Cyberpsychology and Behavior*, *6*, 143–150.
- Wu, H. R. & Zhu, K. J. (2004) Path analysis on related factors causing internet addiction disorder in college students. *Chinese Journal of Public Health*, *20*, 1363–1364.
- Yang, C. K., Choe, B. M., Baity, M., Lee, J. H. & Cho, J. S. (2005) SCL-90-R and 16PF profiles of senior high school students with excessive internet use. *Canadian Journal of Psychiatry*, *50*, 407–414.
- Yoo, H. J., Cho, S. C., Ha, J., Yune, S. K., Kim, S. J., Hwang, J., Chung, A., Sung, Y. H. & Lyoo, I. K. (2004) Attention deficit hyperactivity symptoms and internet addiction. *Psychiatry and Clinical Neuroscience*, *58*, 487–494.
- Young, K. S. (1996) *Internet Addiction: The Emergence of a New Clinical Disorder [On-Line]*. Center for On-Line Addictions, Bradford, USA. Available at: <http://www.netaddiction.com/articles/newdisorder.html> (last accessed 10 May 2005).
- Young, K. S. & Rogers, R. C. (1998) The relationship between depression and Internet addiction. *Cyberpsychology and Behavior*, *1*, 25–28.

This document is a scanned copy of a printed document. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material.