Dysfunctional internet behaviour symptoms in association with personality traits

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Internet addiction is a matter of great interest for researchers, taking into consideration Internet's rapid spread and its ever growing use in children, adolescents and adults. It has been associated with multiple psychological symptoms and social difficulties, therefore raising even greater concerns for its adverse consequences. The present study that consists part of a broader research, aims to investigate the association between excessive Internet use and personality traits in an adult population. Specifically, the research examined the relation between dysfunctional internet behaviour and personality traits as neuroticism and extraversion, the two personality dimensions that have arisen as the most important ones in all relevant research. Our main hypotheses are that dysfunctional internet behaviour would be positively associated with neuroticism but negatively linked to extraversion. The 1211 participants aged over 18 years, completed the IAT (Internet Addiction Test) by Kimberly Young and the Eysenck Personality Questionnaire (EPQ) and some other questionnaires detecting psychopathology. Additionally, part of the administered questionnaires concerned socio-demographic characteristics of the participant subjects: specifically sex, age, marital status, education (educational years), place of residence –urban, semi-urban and rural–, whether they suffer from somatic or mental health disorder and if they take medication for any of the above categories. All the questionnaires have been electronically completed by each participant. Results showed that 7.7% showed dysfunctional internet behaviour that concerns both medium and severe degree of dependence by the use of Internet, as measured by the use of IAT. The univariate logistic regression analysis revealed that the individuals exhibiting symptoms of dysfunctional internet behaviour were more likely to suffer from a chronic mental health disorder, to use psychotropic medication and to score higher on neuroticism. In contrast, they were less likely to have children and be extraverted. Multiple logistic regression analysis confirmed that neuroticism and extraversion were independently associated with dysfunctional internet behaviour. Individuals with high scores on neuroticism were more likely to meet the criteria for dysfunctional inter-

net behaviour, while high scores on extraversion were associated with a lower probability of dysfunctional internet behaviour. Identification of personality traits that could be connected to some sort of "addictive personality" –particularly neuroticism and Introversion– might help researchers to identify and prevent internet addiction on the early stages and possibly could have a positive contribution to the therapeutic treatment of this addiction disorder.

Key words: Internet addiction, personality traits, neuroticism, extraversion.

Introduction

Internet addiction

Nowadays, Internet access is not a privilege to an elite group of people, but a given element of everyday life. As the Internet was growing more rapidly in the last two decades, its use or overuse was arising as a great concern and research topic. The first discussions concentrated on "Internet addicts", who spend excessive amounts of time online and their addiction has significant impact on their lives.[1,2] Pathological Internet users are more likely to be lonely and feel competent and more socially liberated when they communicate online.[3] It is widely acknowledged that Internet use can turn to misuse and cause disturbances in one's life, such as mood-altering use of the Internet, failure to fulfill major role obligations, guilt, craving,[3] problems with managing time and other symptoms similar to those found in addictive behaviours.[1] Furthermore, it could be detrimental to interpersonal relationships, occupational functioning and even one's economic status and physical health.[4]

Dysfunctional Internet Behaviour

While some have adopted the term "addictive",[5] others have talked about "dependent",[4] "problematic"[6] or "pathological"[3] in an effort to describe those who use internet excessively. Their identification is not based solely on the amount of time spent online, but also on their difficulty to control their usage. The newest edition of DSM-5[7] has introduced the term "Internet Addiction Disorder" (IAD), but only as an appendix in the main addictive disorders, which is identified by excessive or poorly controlled preoccupations, urges or behaviours regarding computer or Internet use that leads to impairment or distress.

Dysfunctional Internet Behaviour and personality traits

There is a general consensus and empirical verification of the Big Five model regarding its conceptual framework for personality and its factor structure.[8] One of them is "Neuroticism" which relates to emotional stability. Individuals with higher neuroticism scores tend to be nervous, sensitive, vulnerable and insecure.[9] They are also characterized by anxiety, negative emotionality and are more likely to engage on online interactions than face-to-face ones, in order to gain the social support they need.[10] Neuroticism has emerged as the most prominent personality trait that has been linked to pathological internet use.[11–16] Amiel and Sargent[17] reported that individuals with high scores on Neuroticism used the Internet for social motives, in order to feel less lonely because they belong to a group. A recent Greek study with 4-year medical students, also found that Neuroticism could predict the variability in Internet Addiction Disorder.[18]

On the other side "Extraversion" relates to sociability and positive emotionality. Extraverted individuals tend to be more talkative and friendly, warm and assertive, less reserved and shy.[9] They are characterized by positive emotionality, excitement-seeking and energetic behaviour, thus engaging in more direct social engagement compared to non-direct, such as online social exchanges.[10] Previous research on the association with Internet addiction data has been ambiguous: some studies have reported that it made introverts more introverted,[19,20] while others suggested that the results depend upon the functions Internet serves for users, thus for some users online relationships could be psychologically beneficial.[21] More current studies have shown that severe Internet users tend to score low on extraversion,[11,15,16]

preferring more traditional forms of social interaction.[10,12,19,20]

Aim of the present study

The objective of the present study was to examine the relationship between Dysfunctional Internet Behaviour and personality traits. We chose to examine two of the factors in relation to Dysfunctional Internet Behaviour, thus investigating the possibility that pre-existing and rather stable mechanisms affect internet usage and specifically Neuroticism and Extraversion. Based on previous evidence, we hypothesized that higher levels of Dysfunctional Internet Behaviour would be associated with higher symptoms of Neuroticism and lower symptoms of Extraversion.

Material and methods

Data collection

A sample of adults (18 years of age and above) of both genders who were Internet users were interviewed, particularly individuals who participated in fora or on social networking sites (especially facebook and other similar sites), through which they were originally approached, or other large traffic websites.

The way each population of the sample was recruited and examined is listed as follows: initially, an advertisement/announcement related to the research was published in fora/site/blogs or social networking sites, that were selected after communication with the person or persons responsible for each forum (the term "forum" is used to include all the above web sites), if there was one. The members of these fora that were willing to participate in the research were then referred to a specific email address, where they could fill and submit the self-administered questionnaires.

Data collection lasted three years, namely from 05.07.2011 until 01.06.2014.

Measures

IAT (Internet Addiction Test). The IAT was applied to assess the severity of self-reported compulsive internet use among adults. Specifically, the IAT evaluates the degree of preoccupation, compulsive use, behavioural problems, emotional changes, and impact upon functionality consequent to internet utilization.[22] The scale consists of 20 items, which provide scores ranging from 1 ("rarely") to 5 ("always"). The total IAT score may range from 20 to 100, according to which the higher score reflects the higher level of internet addiction and compulsivity. In order to evaluate the occurrence of internet addiction behavior (IAB), the following cutoff points were applied:[23] (1) no signs of IAB: IAT scores 0–30; (2) mild signs of IAB: IAT scores 31–49; (3) at risk for IAB: IAT scores 50–79, and (4) IAB: IAT scores 80–100. Both mild and severe IAB are Dysfunctional Internet Addiction Behaviour.

EPQ (Eysenck Personality Questionnaire)

EPQ (Eysenck Personality Questionnaire). The Eysenck Personality Questionnaire consists of 84 items, which provide "yes" or "no" scores. The questionnaire aims at investigating three personality dimensions: psychoticism (P), neuroticism (N), extroversion (E), lie (L). The validity of the scales P and L is dubious. The best studied scale is the N, which relates to the clinical diagnosis of neurosis and emotional instability or to personality with stomatic traits, according to the psychoanalytic terminology. The E scale corresponds roughly to personality with histrionic traits, sociability and impulsive elements, whereas the P scale corresponds to personality with obsessive-compulsive traits (it does not relate to psychosis). Finally, the L scale evaluates the degree of pretense from the part of the subject.[24] In the present study we employed the short version of the questionnaire, which assesses only the scales of neuroticism and extroversion.[25,26] Validated Greek version is available.[27,28] Time of administration: approximately 3´.

Statistical analysis

Continuous variables are presented with mean and standard deviation (SD). Qualitative variables are presented with absolute and relative frequencies. The association of Dysfunctional Internet Behaviour with demographics and other factors was firstly investigated using univariate logistic regression analysis. Afterwards, multiple logistic regression analysis was conducted in order to find independent factors associated with the presence of Dysfunctional Internet Behaviour. Adjusted odds ratios (OR) with 95% confidence intervals (95% CI) were computed

from the results of the logistic regression analyses. Hypothesized interactions of variables in the model were not significant. All reported p values are two-tailed. Statistical significance was set at p<0.05 and analyses were conducted using SPSS statistical software (version 19.0).

Results

Data from 1211 participants were analyzed. Sample characteristics are presented in table 1.

Table 1. Sample characteristics.

	n	(%)
Age (years), mean ± SD	29.3±9.8	
Sex		
Men	625	51.7
Women	583	48.3
Place of residence		
Urban (>250,000 residents)	1043	86.3
Urban (>10,000 residents)	135	11.2
Semi-urban/rural (<10,000 residents)	30	2.5
Educational years, mean±SD	15.1±5.5	
Family status		
Single	956	79.1
Divorced	26	2.2
Married	194	16.1
Separated	32	2.6
Children		
No	1012	83.8
Yes	196	16.2
Somatic health disorder		
No	911	75.4
Yes	297	24.6
Taking medicine		
No	1041	86.2
Yes	167	13.8
Mental health disorder		
No	1135	94.0
Yes	73	6.0
Use of psychotropic medication		
No	1155	95.6
Yes	53	4.4
Neuroticism, mean±SD	5.1±2.3	
Extraversion, mean±SD	4.5±1.4	

Almost half of them were men (51.7%) and the sample mean age was 29.3 years (SD=9.8). Most participants were single with the percentage being equal to 79.1%. The mean educational years were 15.1 (SD=5.5). In addition, 86.3% of the participants lived in urban place with more than 250,000 residents. Chronic somatic health condition was present in 24.6% of the sample and chronic mental health problem was present in 6% of the sample. Also, 13.8% of the sample took medicine and 4.45 used psychotropic treatment; 71.2% of the participants had no signs of IAB, 21.1% had mild signs of IAB, 7.5% were at risk for IAB and 0.3% had IAB. Thus, 7.7% of the participants had Dysfunctional Internet Behaviour (figure 1).

Table 2 shows differences in the presence of Dysfunctional Internet Behaviour as derived by univariate logistic regression analysis. The odds for Dysfunctional Internet Behaviour were higher in subjects with Chronic mental health problem, in those using psychotropic treatment and lower in subjects that had children. Furthermore, greater scores on Neuroticism scale were positive associated with the presence of Dysfunctional Internet Behaviour, while greater scores on Extraversion scale were associated with lower odds for Dysfunctional Internet Behaviour in univariate analysis.
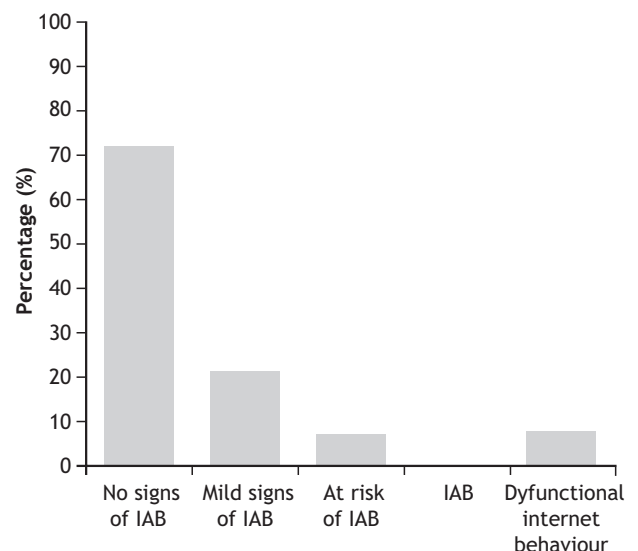

Figure 1. Proportion of participants with IAB signs.

Table 2. Proportion of subjects with Dysfunctional Internet Behaviour and associations derived by univariate logistic regression analysis.

	n	(%)	OR (95% CI)[*]	p
Age (years), mean±SD	28.9±9.3 vs 27.1±8.6		0.97 (0.95–1.00)	0.077
Sex	54	9.1	1.00**	
Men	35	6.3	0.67 (0.43–1.05)	0.079
Women	27.1±8.6		0.97 (0.95–1.00)	0.077
Place of residence				
Urban (>250,000 residents)	77	7.8	1.00	
Urban (>10,000 residents)	8	6.3	0.79 (0.37–1.68)	0.544
Semi-urban/rural (<10,000 residents)	4	13.8	1.90 (0.65–5.60)	0.244
Educational years, mean±SD	15.3±5.4 vs 16.2±4.3		1.04 (0.99–1.08)	0.117
Married				
No	81	8.3	1.00	
Yes	8	4.7	0.54 (0.26–1.15)	0.109
Children				
No	83	8.4	1.00	
Yes	6	3.8	0.43 (0.18–1.00)	0.050
Somatic health disorder				
No	77	8.5	1.00	
Yes	12	5.0	0.58 (0.31–1.08)	0.083
Taking medicine				
No	73	7.3	1.00	
Yes	16	11.0	1.58 (0.89–2.80)	0.116
Mental health disorder				
No	79	7.2	1.00	
Yes	10	19.6	3.15 (1.52–6.52)	0.002
Use of psychotropic medication				
No	83	7.5	1.00	
Yes	6	17.1	2.57 (1.04–6.37)	0.041
Neuroticism, mean±SD	4.9±2.3 vs 6.7±2.0		1.45 (1.30–1.62)	<0.001
Extraversion, mean±SD	4.5±1.3 vs 4.1±1.6		0.81 (0.69–0.94)	0.005

*Odds Ration (95% Confidence interval), **indicates reference category

When multiple logistic regression analysis was conducted (table 3) it was found that Neuroticism and Extraversion were independently associated with the presence of Dysfunctional Internet Behaviour. Specifically, adjusting for other variables greater scores on Neuroticism were associated with great-

Table 3. Results from multiple logistic regression analysis with dependent variable the presence of Dysfunctional Internet Behaviour.

	OR (95% CI)*	p
Age (years)	0.99 (0.95–1.04)	0.790
Sex	1.00**	
Men	0.68 (0.42–1.09)	0.109
Women	0.99 (0.95–1.04)	0.790
Place of residence		
Urban (>250,000 residents)	1.00	
Urban (>10,000 residents)	0.83 (0.38–1.82)	0.651
Semi-urban/rural (<10,000 residents)	1.76 (0.55–5.59)	0.338
Educational years	1 (0.93–1.08)	0.979
Married		
No	1.00	
Yes	1.31 (0.43–4.02)	0.632
Children		
No	1.00	
Yes	0.53 (0.14–1.96)	0.339
Somatic health disorder		
No	1.00	
Yes	0.48 (0.13–1.75)	0.264
Taking medicine		
No	1.00	
Yes	1.25 (0.61–2.56)	0.538
Mental health disorder		
No	1.00	
Yes	2.33 (0.82–6.66)	0.114
Use of psychotropic medication		
No	1.00	
Yes	1.14 (0.29–4.57)	0.852
Neuroticism	1.41 (1.26–1.58)	<0.001
Extraversion	0.85 (0.73–1)	0.048

*Odds Ration (95% Confidence interval), **indicates reference category

er likelihood for Dysfunctional Internet Behaviour, while greater scores on Extraversion were associated with lower likelihood for Dysfunctional Internet Behaviour.

Discussion

Internet's high level of accessibility and its range of services provide a potential for overuse. In our research 7.7% of the participants reported Dysfunctional Internet Addiction Behavior, which is in accordance to other recent studies.[16] The "addictive" group was more likely to score higher in mental health disorders and using psychotropic medication, a finding confirmed by multiple studies.[3,6,11]

Concerning our main research goal, Neuroticism and Extraversion emerged as important factors of Dysfunctional Internet Behaviour. Specifically in the mean of high Neuroticism which seemed to increase significantly the chances of being addicted to the Internet. This finding suggests that low emotional stability can predict, to a certain extent, Dysfunctional Internet Behaviour. These individuals may use the Internet as a substitute for traditional social interactions, a point that has been made by many other studies.[12,17]

On the other hand, Extraversion was negatively associated with Dysfunctional Internet Behaviour. Consequently, the more extraverted the individual was, the less he or she would engage in high levels of internet usage. As Landers and Lounsbury[20] suggested, introverted people may have more free time to be online or be more attracted to it than face-to-face interactions, because they can "…quietly immerse themselves in what is essentially solitary behavior". Extraversion seems to function as a protective factor, motivating individuals to spend time in more interpersonal activities rather than using the Internet to an excessive degree.

Identification of personality traits that could be connected to "addictive personality"[14] –neuroticism, introversion– may help researchers to identify and prevent internet addiction early on. In the future, it would be useful to study all of the Big Five traits, because this particular model grants researchers a vastly accepted measure for understanding personality dynamics across different settings.[20] Although causality is hard to determine, the impact of other factors on Dysfunctional Internet Behaviour could be further explored, after taking into account the personality effects.

Συμπτώματα δυσλειτουργικής συμπεριφοράς σε χρήστες του διαδικτύου σε σχέση με χαρακτηριστικά της προσωπικότητας

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Η εξάρτηση από το Διαδίκτυο είναι ένα θέμα με μεγάλο ενδιαφέρον για τους ερευνητές, λόγω της ταχείας εξάπλωσης του Διαδικτύου και της ολοένα αυξανόμενης χρήσης του από παιδιά, εφήβους και ενήλικες. Έχει συνδεθεί με πολλαπλά ψυχολογικά συμπτώματα και κοινωνικές δυσκολίες, δημιουργώντας μ' αυτόν τον τρόπο ακόμα μεγαλύτερες ανησυχίες για τις αρνητικές συνέπειές του. Η παρούσα έρευνα που αποτελεί μέρος μιας ευρύτερης έρευνας έχει στόχο να διερευνήσει τη σχέση μεταξύ της υπερβολικής χρήσης του διαδικτύου και χαρακτηριστικών της προσωπικότητας σε ενήλικες. Συγκεκριμένα, εξετάζεται η σχέση μεταξύ της δυσλειτουργικής διαδικτυακής συμπεριφοράς (dysfunctional internet behaviour) και του νευρωτισμού και της εξωστρέφειας, των δύο διαστάσεων της προσωπικότητας που έχουν θεωρηθεί οι πιο σημαντικές σε όλες τις σχετικές έρευνες. Οι κύριες υποθέσεις μας είναι ότι η δυσλειτουργική διαδικτυακή συμπεριφορά θα σχετίζεται θετικά με τον νευρωτισμό αλλά αρνητικά με την εξωστρέφεια· 1211 άτομα ηλικίας άνω των 18 ετών εξετάσθηκαν μέσω ηλεκτρονικά συμπληρούμενων από τον ίδιο τον συμμετέχοντα δομημένων ερωτηματολογίων που εμπεριείχαν μεταξύ άλλων το IAT (Internet Addiction Test) της Kimberly Young, το Eysenck Personality Questionnaire (EPQ) και κλίμακες ανεύρεσης ψυχοπαθολογίας. Επιπλέον, μέρος των χορηγηθέντων ερωτηματολογίων αφορούσε κοινωνικο-δημογραφικά χαρακτηριστικά των συμμετεχόντων ατόμων, και συγκεκριμένα φύλο, ηλικία, οικογενειακή κατάσταση, εκπαίδευση (έτη σπουδών), περιοχή διαμονής –αστική, ημιαστική ή αγροτική–, εάν πάσχουν από οργανικά ή ψυχιατρικά προβλήματα υγείας, και εάν λαμβάνουν για κάποια/ες από τις δύο κατηγορίες φαρμακευτική αγωγή. Σύμφωνα με τα ευρήματα, το 7,7% του δείγματος είχε δυσλειτουργική διαδικτυακή συμπεριφορά που συμπεριλαμβάνει τη μέτριου και σοβαρού βαθμού εξάρτηση από τη χρήση του διαδικτύου, σύμφωνα με το ερωτηματολόγιο IAT. Η μονοπαραγοντική ανάλυση λογιστικής παλινδρόμησης έδειξε ότι άτομα που εμφανίζουν συμπτώματα δυσλειτουργικής διαδικτυακής συμπεριφοράς είναι πιθανότερο να πάσχουν από μια χρόνια ψυχική διαταραχή, να κάνουν χρήση ψυχοτρόπων φαρμάκων και να έχουν υψηλότερες βαθμολογίες στον νευρωτισμό. Αντίθετα, ήταν λιγότερο πιθανό να έχουν παιδιά και να είναι εξωστρεφείς. Η πολυπαραγοντική ανάλυση λογιστικής παλινδρόμησης επιβεβαίωσε ότι ο νευρωτισμός και η εξωστρέφεια συσχετίσθηκαν ανεξάρτητα με τη δυσλειτουργική διαδικτυακή συμπεριφορά. Τα άτομα με υψηλή βαθμολογία στον νευρωτισμό είχαν αυξημένες πιθανότητες να πληρούν τα κριτήρια για δυσλειτουργική διαδικτυακή συμπεριφορά, ενώ η υψηλή βαθμολογία στην εξωστρέφεια συσχετίσθηκε με μικρότερη πιθανότητα για δυσλειτουργική διαδικτυακή συμπεριφορά. Ο εντοπισμός χαρακτηριστικών προσωπικότητας που θα μπορούσαν να συνδεθούν με κάποιο είδος «εθιστικής προσωπικότητας» –ο νευρωτισμός και η εσωστρέφεια συγκεκριμένα– θα μπορούσε να βοηθήσει τους ερευνητές να προσδιορίσουν έγκαιρα και έτσι να εμποδίσουν την ανάπτυξη του εθισμού στο διαδίκτυο, αλλά ενδεχομένως να συμβάλει θετικά και στη θεραπευτική αντιμετώπιση της διαταραχής εθισμού.

Λέξεις ευρετηρίου: Εξάρτηση από το διαδίκτυο, χαρακτηριστικά προσωπικότητας, νευρωτισμός, εξωστρέφεια.

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