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The role of personality traits in Facebook and Internet addictions: A study on Polish, Turkish, and Ukrainian samples

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ABSTRACT

Although the relationships between Facebook addiction, Internet addiction and personality have already been investigated. The aim of the present study was to explore whether there were personality traits associated with Facebook addiction and Internet addiction across three different cultures. The participants were 1011 Facebook users from Poland, Turkey, and Ukraine. We administered the Bergen Facebook Addiction Scale, the Internet Addiction Test, and the Ten Item Personality Inventory. We found that in the total sample Facebook addiction was positively associated with Internet addiction, while Internet addiction was negatively associated with emotional stability, conscientiousness, and extraversion. The lack of invariance across the countries indicates that the tested links are not the same in each of them, which may suggest the role of cultural factors in this phenomenon. The results are discussed in the light of Facebook addiction and personality literature. The application of culturally sensitive intervention programs in dealing with Facebook addiction is encouraged.

Using the Internet and Facebook has become very global, common, and incorporated in daily routine among other activities (e.g., driving a car or walking). Individuals increasingly choose to communicate via the Internet rather than face to face (Chou, Condron, & Belland, 2005), with the help of a wide range of mostly mobile devices (Tang, Chen, Yang, Chung, & Lee, 2016). Also, several websites, including online social networking sites such as Facebook and Twitter, make Internet use very attractive and exciting. Using social networking sites has an impact on the quality and quantity of an individual's social interactions (Ryan & Xenos, 2011).

The universality of the Internet and easy access to it lead to problematic usage, affecting different aspects of life. Although Internet addiction was not listed in the Diagnostic and Statistical Manual of Mental Disorders, this concept has been described in terms of DSM-IV addiction criteria, which include tolerance and abstinence symptoms, anxiety and a desire to use despite problems in relationships (Goldberg, 1995). Young (1998) defines Internet addiction as an impulse control disorder that does not cause intoxication.

As in the case of Internet addiction, habitual activity, excessive involvement, and using Facebook to escape mood changes are mentioned in a meta-analysis as common elements of Facebook addiction (Ryan, Chester, Reece, & Xenos, 2014). Facebook addiction is defined as excessive attachment to Facebook that leads to disturbances in everyday activities and problems with interpersonal relationships (Elphinston & Noller, 2011). What is more, Facebook addiction is has six aspects typical of addiction in general, namely: salience, mood modification, tolerance, withdrawal, conflict, and relapse (Andreassen, Torsheim, Brunborg, & Pallesen, 2012).

As regards the scale of the phenomenon, 1% of the sample of approximately 900 Taiwanese university students in a recent study were described as Facebook-addicted while 17.8% were in a serious danger of Facebook addiction (Tang et al., 2016). In a sample of approximately 450 Turkish university students, 90.6% reported that they used Facebook daily, with a mean of 7 h a week (Koc & Gulyagci, 2013). As has been presented in other studies, especially

young people are at risk of developing Internet addiction (Kandell, 1998; Kuss, Griffiths, & Binder, 2013).

The body of literature shows that there are some personality characteristics related to Internet addiction, such as shyness (Chak & Leung, 2004), external locus of control (Hamburger & Ben-Artzi, 2000), low self-esteem (Yang & Tung, 2007), or loneliness (Morahan-Martin & Schumacher, 2000; Niemz, Griffiths, & Banyard, 2005). On the other hand, differences between Facebook profiles and individuals' actual personalities have been examined in some studies (Back et al., 2010; Bargh, McKenna, & Fitzsimons, 2002). Researchers have mainly explored Facebook preferences and their relationship with personality. For instance, the relationship between neuroticism and Facebook use was highlighted in a study of Australian Internet users (Ryan & Xenos, 2011). Similarly, the relationship between self-representations on Facebook and the Big Five personality traits in a sample of US students demonstrated that neuroticism, agreeableness, and conscientiousness were related to higher expression of the real self (Seidman, 2013). However, in the same study, neuroticism was also associated with having a higher hidden self and expressing a higher ideal self. Apart from these Big Five personality traits, extraversion and Facebook usage as well as introversion and Facebook usage were found to be associated with each other in other studies (respectively: Amichai-Hamburger & Vinitzky, 2010; Kuss & Griffiths, 2011). In line with these findings, self-inferiority and depressive character were associated with Facebook use (Hong, Huang, Lin, & Chiu, 2014). As regards Facebook profile preferences and their relationship with personality, higher agreeableness, a larger number cross-sex friends, and higher extraversion were significant (Lönnqvist, Itkonen, Verkasalo, & Poutvaara, 2014). These studies revealed the associations between personality and Facebook use, while the relationship between personality and Facebook addiction has not been sufficiently investigated. Although there was a positive correlation between Facebook use and Facebook addiction (Hong et al., 2014), it remained unknown whether there are personality traits typical of Facebook addicts. Andreassen et al. (2013) found that among Norwegian users Facebook addiction was positively linked with extraversion as well as negatively linked with openness and conscientiousness. Furthermore, negative associations between Facebook addiction and conscientiousness, emotional stability, and openness to experience were revealed in a Polish sample (Błachnio & Przepiórka, 2016). A study of Taiwanese university students revealed that Facebook addiction was negatively correlated with agreeableness, conscientiousness, and neuroticism (Tang et al., 2016). Some results indicate that cultural factors can play a role in explaining the phenomenon of Facebook addiction (Błachnio et al., 2016).

The main aim of the present study was to examine the relationship between Internet addiction, Facebook addiction and the Big Five personality traits (see Fig. 1). As emphasized by the social compensation theory, individuals experiencing insecurity in daily-life relationships are more likely to develop negative self-identity and are more likely to use social networking sites to compensate social needs due to deficiencies in self-esteem and life satisfaction (Hong et al., 2014). Therefore, such personality traits might result in vulnerability to addiction to social networking sites such as Facebook. We expected a relationship between personality traits and both addictions. One of the advantages of the present study is the cross-cultural comparison between Facebook users from Poland, Turkey, and Ukraine. We hypothesized that there would be some cultural differences between these countries in terms of Internet and Facebook predictors. We chose Facebook users from those particular countries because they represent different cultures and historical backgrounds and are currently in different geopolitical situations, which makes comparisons worthwhile. The three

countries differ on the Individualism dimension as defined by Hofstede (1980): Poland scored 60, Turkey 37, Ukraine 20.[1] Individualism vs. Collectivism is a dimension that reflects the level of integration with the group and the extent to which importance is placed on attaining personal or group goals. Previous studies suggested that people from individualistic vs. collectivistic cultures use Facebook in different ways. As was hypothesized, people from individualistic cultures post private information on Facebook more eagerly than people from collectivistic cultures (Nadkarni & Hofmann, 2012). Moreover, we can suppose that the frequency of Facebook use differs among people depending on the level of individualism. Jackson and Wang' (2013) found that social media users in China, where collectivistic values dominate, used social media less often than Americans.

Moreover, as we can see on the Inglehart—Welzel cultural map[2] of world, where countries are plotted on two dimensions: traditional vs. secular-rational values and survival vs. self-expression values, Poland, Turkey, and Ukraine differ on these dimensions. (see Fig. 2).

Many studies have been conducted among American Internet users (e.g., Seidman, 2013), and so comparing results obtained in different countries representing different continents seems to be interesting and useful. Firstly, the prevalence of Internet addiction varies across countries (Cheng & Li, 2014). Secondly, Internet and Facebook penetration rates in these countries are different (US: 88.5% and 62%, respectively; Turkey: 58% and 52.8%; Poland: 72.4% and 36.3%; Ukraine: 44.1% and 12.7%). These discrepancies in access to the Internet and Facebook result in different backgrounds for their users in these countries.[3,4] Secondly, there are differences in industrial, economic, societal, and technological development in the US and in the other countries included in the study[5,6]. There is scarce research focusing on the cultural context in the development of Internet and Facebook addictions (e.g., Błachnio et al., 2016; Lee-Won, Shim, Joo, & Park, 2014; Reed, Spiro, & Butts, 2016). As was proved in the study by Srite and Karahanna (2006), the national cultural values of masculinity/femininity, individualism/collectivism, power distance, and uncertainty avoidance influence the acceptance of technology by end-users. Furthermore, as highlighted by Kuss and Griffiths (2011), using representative samples is crucial to the understanding of Facebook addiction.

1. Method

1.1. Participants and procedure

The participants were 1011 individuals (67% women) possessing Facebook accounts, aged between 13 and 56, with a mean age of $M = 21.48$ years. This included 320 Turkish participants aged 17—37 ($M = 21.94$, $SD = 3.63$; 66% were females), 350 Poles, aged 13—38 ($M = 20.87$, $SD = 2.87$; 67% were females), and 341 Ukrainians aged 14 to 56 ($M = 21.70$, $SD = 6.77$; 66.9% were females). The sample is presented in Table 1. We applied the snowball procedure to recruit the participants. We prepared electronic versions of the questionnaires and sent the link to the study website to undergraduate students, requesting them to post it on their Facebook walls and thus spread the message about the study among their Facebook friends. The participants received no remuneration for their participation.
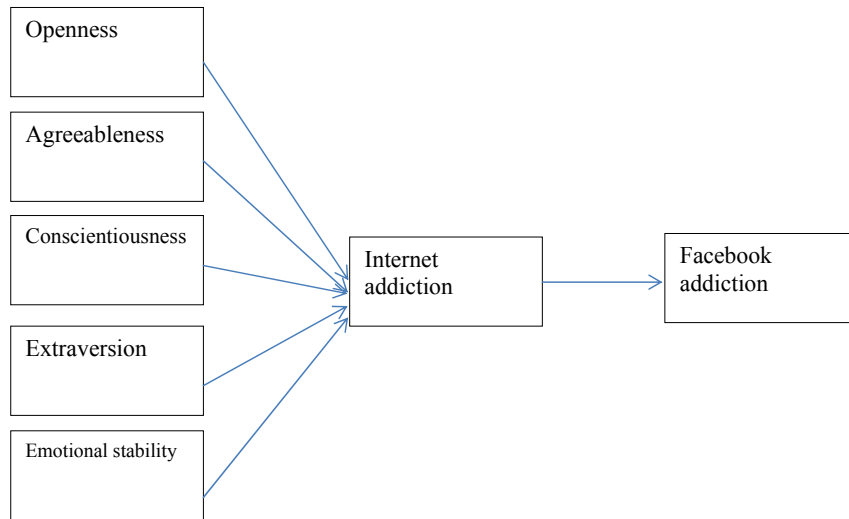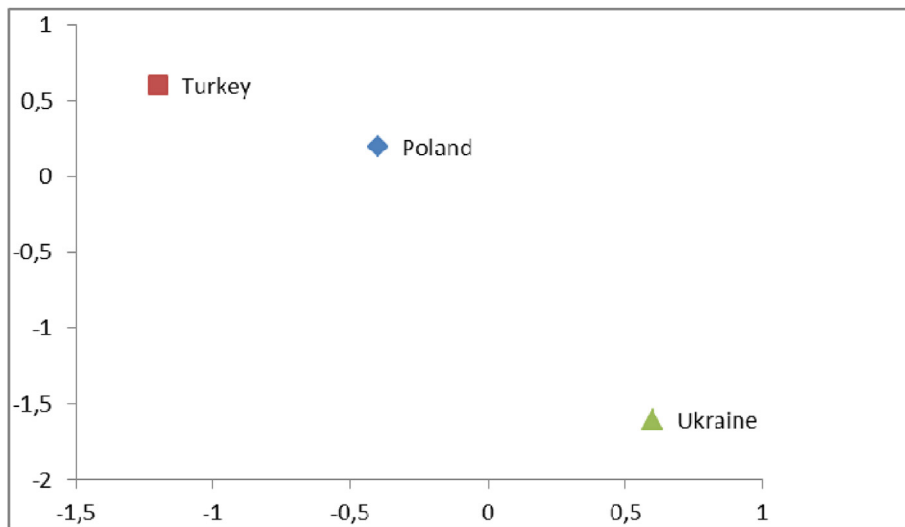
Fig. 1. A model of hypothetical relationships.

Fig. 2. Turkey, Poland and Ukraine on cultural map of Inglehart-Welzel. The authors' based on data from http://www.worldvaluessurvey.org.

Table 1
The characteristics of the sample.

		Poland	Turkey	Ukraine
N		350	320	341
Gender	Female	*N* = 235 (67%)	*N* = 211 (66%)	*N* = 255 (66%)
	Male	*N* = 115 (33%)	*N* = 109 (34%)	*N* = 86 (34%)
Age		13—38 years	17—37 years	14—56 years
		M = 20.87 years, *SD* = 2.87	*M* = 21.94 years, *SD* = 3.63	*M* = 21.70 years, *SD* = 6.77

The remaining results from this project were published in Błachnio, Przepiórka, Senol-Durak, Durak, & Sherstyuk, 2016.

1.2. Instruments

The investigators used the Polish, Turkish, and Ukrainian adaptations all of the scales. The instruments had been adapted using the back-translation method.

For measuring Facebook addiction, we used *the Bergen Facebook Addiction Scale* (BFAS; Andreassen et al., 2012), consisting of 18 items, with 3 items concerning each symptom of addiction: salience, mood modification, tolerance, withdrawal, conflict, and relapse (Andreassen et al., 2012). In the present study, Cronbach's α reliability of the scale was 0.94 for Turkey, 0.94 for Poland, and 0.91 for Ukraine.

To assess the factor structure equivalence of the BFAS, the results of factor analysis performed on the aggregated sample (all countries, *N* = 959) were compared with the solutions obtained in each of the eight countries (as in Sircova et al., 2014). As the BFAS is a unidimensional measure, principal components analysis was

performed to extract a single general factor, and the first unrotated factor was extracted. The solution for the aggregated sample is presented in Table 2. Factor loadings for each person were saved using the regression method. This analysis was done first on the whole sample and then in each country separately. This yielded two factor loadings for each person − one relating to the pooled solution and the second one to the country. The two sets of factor loadings were compared using Tucker's phi method.

The analyses were done by means of the SPSS 21 package. Tucker's phi coefficients were calculated using an Excel spreadsheet containing the formula.

Tucker's phi coefficients comparing the factor structure in each country to the pooled solution were as follows: 0.991 for Turkey, 0.990 for Poland, and 0.999 for Ukraine. By all conventions, the Tucker's phi indicated a good cross-cultural equivalence of the BFAS (cf. Lorenzo-Seva & Berge, 2006), especially for Ukraine.

Young's Internet Addiction Test consists of 20 items (e.g., *How often do you become defensive or secretive when anyone asks you what you do on-line?*; *How often do you block out disturbing thoughts about your life with soothing thoughts of the Internet?*). In the case of the Turkish adaptation of the IAT, psychometric properties were tested before the present study, based on data collected from 208 Turkish university students. Its internal consistency was $\alpha = 0.92$ and item−total correlations ranged from 0.35 to 0.62. In Poland, we used the adaptation by Hawi, Błachnio, and Przepiórka (2015). In the Ukrainian sample, an unpublished version was administered to the participants. The IAT is a valid cosmopolitan one-factor instrument for measuring Internet addiction. Each item was rated on the following Likert scale: *not applicable*, *rarely*, *occasionally*, *frequently*, *often*, and *always*. Cronbach's α was 0.91 for Turkey, 0.93 for Poland, and 0.85 for Ukraine.

We also used the *Ten Item Personality Inventory* (TIPI; Gosling, Rentfrow, & Swann, 2003), measuring the Big Five dimensions: extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience. We used the adapted versions of this measure: Polish, Ukrainian, and Turkish (Cronbach's α ranged from 0.23 to 0.63). TIPI consists of 10 items, 2 items for each of the 5 dimensions. Each item is a pair of characteristics related to a particular dimension, for example: extraverted, enthusiastic; reserved, quiet. The items are rated on a 7-point Likert scale from $1 = $ *disagree strongly* to $7 = $ *strongly agree*.

Table 2
Factor loadings on the general factor (pooled sample).

Item	Loading
BFAS_6	0.77
BFAS_5	0.73
BFAS_12	0.73
BFAS_15	0.73
BFAS_11	0.73
BFAS_8	0.71
BFAS_7	0.70
BFAS_14	0.70
BFAS_10	0.70
BFAS_9	0.68
BFAS_13	0.68
BFAS_2	0.67
BFAS_3	0.67
BFAS_4	0.65
BFAS_17	0.65
BFAS_18	0.65
BFAS_1	0.63
BFAS_16	0.62

Eigenvalue of the general factor: 1.08.
Percentage of variance explained: 47.55.

2. Results

The means and standard deviations are presented in Table 3. The country where the Internet had been used for the longest time is Poland, $F(2, 1002) = 15.140$, $p = 0.001$. Daily Internet use was the largest in Ukraine, $F(2, 995) = 6.510$, $p = 0.002$. The countries differ in the level of Facebook addiction, $F(2, 1008) = 6.922$, $p = 0.001$, with Polish users scoring higher on this variable than Turkish and Ukrainian users.

As the next step, correlations were computed for each sample (Table 4). In the Polish sample, Facebook addiction correlated negatively with openness, agreeableness, emotional stability, and conscientiousness. In the Turkish sample Facebook addiction correlated negatively with openness, emotional stability, conscientiousness, and extraversion. In the Ukrainian sample, Facebook addiction correlated negatively with emotional stability, conscientiousness, and extraversion (Table 4).

The next step was to test the model that examines the role of Internet addiction and the five dimensions of personality in Facebook addiction. We examined the cross-cultural invariance: first the model was tested among the total sample and then for each of the countries.

Among the total sample, goodness-of-fit indices were rather low, $\chi^2/df = 11.94$, RMSEA $= 0.10$ (90% CI $= [0.08, 0.13]$); CFI $= 0.91$, TLI $= 0.81$. As shown in Table 5, Facebook addiction was positively related to Internet addiction, and Internet addiction was negatively associated with emotional stability, conscientiousness, and extraversion.

In the next step, we tested measurement invariance across the three countries (see Table 6). To test measurement invariance between women and men, we fitted three models to the data with increasingly more constraints: Model 1 − the same path coefficients across groups; Model 2 − the same path coefficients and intercepts across groups; Model 3 − the same path coefficients, intercepts, and residuals across groups. The analyses were done by means of the lavaan package (Rosseel, 2012). Our results did not confirm measurement invariance.

3. Discussion

The main aim of present study was to investigate the role of personality in Internet addiction and Facebook addiction in three countries: Turkey, Poland, and Ukraine. As the existing body of research has shown, personality plays an important role in determining Facebook use and certain activities on Facebook (e.g., Eftekhar, Fullwood, & Morris, 2014) such as uploading photos, status updating, the number of friends displayed (e.g., Lee, Ahn, & Kim, 2014), photo-related activities, or the choice of profile pictures (e.g., Wu, Chang, & Yuan, 2015). In the present study, we investigated personality as a possible predictor of Facebook addiction. The role of personality was examined in three countries: Turkey, Ukraine, and Poland. As a result, some different patterns were found in these countries. We found the highest level of Facebook addiction among Polish users as well as the highest number of hours spent online every day in the Ukrainian group.

We found that among the total sample Facebook addiction was positively associated with Internet addiction. Facebook addiction and Internet addiction are the same phenomenon. Facebook addiction can be defined as a subtype of Internet addiction (Andreassen & Pallesen, 2014). Previous studies indicated that both addictions have the same predictors, but they also have some that are different (Błachnio & Przepiórka, 2016).

Additionally, we found that Internet addiction was negatively connected with emotional stability, conscientiousness, and extraversion. Previous studies revealed its negative associations with

Table 3
Means and standard deviations for Poland, Turkey, and Ukraine.

	Poland		Turkey		Ukraine	
	M	SD	M	SD	M	SD
Openness	5.10	1.31	5.57	1.25	5.41	1.20
Agreeableness	4.66	1.20	5.09	1.16	4.93	0.99
Emotional stability	4.01	1.33	4.47	1.35	4.66	1.20
Conscientiousness	4.57	1.36	5.68	1.31	5.50	1.05
Extraversion	4.92	1.38	5.39	1.48	4.28	1.04
Facebook addition	2.01	0.84	1.79	0.77	1.88	0.64
Daily Internet use time in minutes	195	131.54	220.94	172.57	241	184.27
Internet use in years	8.96	2.65	8.49	2.77	7.72	3.44

Table 4
Correlations between variables in the Polish sample.

		1	2	3	4	5	6
1. Openness							
2. Agreeableness	Poland	0.26***					
	Turkey	0.16**					
	Ukraine	0.05					
3. Emotional stability	Poland	0.16***	0.32***				
	Turkey	0.15**	0.27***				
	Ukraine	0.09	0.36***				
4. Conscientiousness	Poland	0.28***	0.19***	0.24***			
	Turkey	0.39***	0.21***	0.41***			
	Ukraine	0.15**	0.15**	0.24***			
5. Extraversion	Poland	0.49***	0.30***	0.09	0.17**		
	Turkey	0.46**	0.09	0.21***	0.43***		
	Ukraine	0.26***	−0.07	−0.14*	−0.10		
6. Facebook addition	Poland	−0.20*	−0.11*	−0.20***	−0.17**	−0.06	
	Turkey	−0.13*	−0.06	−0.16**	−0.24***	−0.13*	
	Ukraine	−0.09	−0.01	−0.27***	−0.28***	0.05	
7. Internet addiction	Poland	−0.20***	−0.12*	−0.20***	−0.22***	−0.08	0.69***
	Turkey	−0.15**	−0.08	−0.19***	−0.30***	−0.18***	0.73***
	Ukraine	−0.05	−0.04	−0.24***	−0.31***	0.14*	0.77***

$^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$.

Table 5
Standardized path coefficients.

Dependent variable	Predictor	Coefficient	p
Facebook addiction	Internet addiction	0.616	<0.001
Internet addiction	Openness	−0.008	0.821
Internet addiction	Agreeableness	−0.010	0.751
Internet addiction	Emotional stability	−0.068	0.041
Internet addiction	Conscientiousness	−0.156	<0.001
Internet addiction	Extraversion	−0.170	<0.001

conscientiousness and Facebook addiction are in line with the study by Caci, Cardaci, Tabacchi, and Scrima (2014), who showed that high conscientiousness was related to a lower frequency and shorter duration of Facebook sessions and a lower number of Facebook friends. Similarly, previous research showed that conscientiousness was related to problematic Internet use and Facebook addiction (Błachnio & Przepiórka, 2016). There was also a negative relationship between conscientiousness and Internet

Table 6
Measurement invariance statistics.

Model	Model fit				Differences between models			
	df	chi²	CFI	RMSEA	Δchi²	Δdf	ΔCFI	p for difference
1. Path coeff.	15	27.508	0.983	0.050				
2. Intercepts	19	85.954	0.912	0.102	58.446	4	0.072	<0.001
3. Residuals	23	178.420	0.795	0.142	92.467	4	0.117	<0.001

conscientiousness and extraversion (Stieger, Burger, Bohn, & Voracek, 2013) as well as with emotional stability (Błachnio & Przepiórka, 2016). Our results find support in the body of other previous research, reporting that, among students, conscientiousness significantly predicted Facebook use (Yesil, 2014). Personality determines the way Facebook is used. Amichai-Hamburger and Vinitzky (2010) found that extraversion was related to higher social behavior. Our results concerning the association between

addiction (Zhou, Li, Li, Wang, & Zhao, 2017). This result was explained in another study as stemming from the fact that conscientious people are more likely to use social networking sites cautiously (Tang et al., 2016) and might prefer real-life experiences to online experiences (Taş & Ayas, 2015). Results consistent with previous research were also obtained for Facebook quitters, who scored higher on conscientiousness (Stieger et al., 2013).

The lack of measurement invariance across the three countries

indicates that the tested links are not the same in these countries, which in turn suggests the role of cultural factors in Facebook and Internet addiction. This result is consistent with previous studies (e.g., (Błachnio et al., 2016). In the literature it was hypothesized that people from individualistic cultures more often post private information on Facebook than people from collectivistic cultures (Nadkarni & Hofmann, 2012). Moreover, some results indicate that people from collectivistic cultures (e.g., China) use social networking sites less often than people from individualistic countries (e.g., USA) (Jackson & Wang, 2013). The cultural factors should be investigated in the next study.

It is possible to indicate some limitations of this study as well as certain implications for future research. The personality test we used has rather low reliability. Yet, it is presented in the literature as a good method for online research and for situations where it is impossible to use longer methods. The test has only two items for each dimension, which is why it cannot achieve high internal consistency (Łaguna, Bąk, Mielniczuk, Oleś, & Purc, 2014). This scale is widely used in several languages and, consequently, it is valued for cross-cultural comparisons. The obtained results may be useful in outlining the psychological profile of users who might be vulnerable to Facebook addiction. The use of a cross-sectional design limits the possibility of reaching conclusive statements. However, consistent findings across three different cultures can be considered valid. Further studies concerning different cultures are needed to see culture-specific issues over Facebook addiction. The application of culturally sensitive intervention programs in dealing with Internet and Facebook addictions should also be encouraged, and intervention programs focusing on each personality trait should can be considered in future studies. What is more, similar studies on the relations between different personality constructs may show their role in developing Internet and Facebook addictions. Further studies should seek to determine the characteristics of those who are currently addicted and to assess whether or not they are universal ones across different countries regardless of cultural background. In the discussion of whether or not this type of research supports the incorporation of Internet and Facebook addiction into new psychiatric classifications in order to address these new problems seriously. These kinds of studies give insight into the role of cultural factors in Internet and Facebook addiction.

Acknowledgments

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