International Journal of Applied Social Science ***RESEARCH PAPER***
Volume 4 (11&12), November & December (2017) : 472-482 ISSN : 2394-1405
Received : 07.11.2017; Revised : 16.11.2017; Accepted : 24.11.2017

Personality, loneliness and subjective well-being as predictors of problematic mobile phone usage

REMIA MAHAJAN, RICHA GUPTA* AND ARTI BAKHSHI
Department of Psychology, University of Jammu, Jammu (J&K) India

ABSTRACT

The use of mobile phones has become so much integrated in our lives that they seem to be indispensable and problematic at times. This study sought to explore how well personality, loneliness and subjective well-being (SWB) could potentially predict the problematic use of mobile phones among 150 mobile phone users (females=90 and males=60) in the age group of 18-24 years. Also differences in problematic use of mobile phones were studied with respect to gender and age. Regression analysis revealed that some personality domains (openness to experience, extraversion, conscientiousness, and neuroticism), social loneliness and SWB predicted problematic use of mobile phones. Gender but not age brought significant differences in mobile phone users on the scores of PUMP scale. It can be concluded that these predictors would enable the screening of and intervening in the potentially problematic behaviours of mobile phone users. The findings support the current perspective of understanding the problematic use of mobile phone which could lead to substance abuse addiction.

Key Words : Personality, Loneliness, Subjective well-being, Problematic use, Mobile phones

INTRODUCTION

With the surging technological advancements many people have become tech-savvy. One of the reflections of technological savviness is evident from the enhanced penetration of mobile phone usage in our day-to-day lives, that they seem inseparable. In today's time, mobile phone is not just a fashion accessory or a style statement for a rich man only. Across the world, people from all ages, economical and cultural backgrounds are adopting mobile phones for various purposes. But just like any other technological invention, there are negative aspects associated with its use which are considered as problematic.

The problematic use of mobile phone could be defined as "person's perceived tendency to chronically use mobile phone services in excess of his needs and resources" (James, 2012). This problematic use is associated with its absolute dependence on the gadget and when it starts distracting the user from executing daily life activities, be it work or studies. Even health related symptoms like sleeplessness, headaches, fatigue, impaired concentration, problems in hearing, etc. in users who use mobile phones in excess. Given the fact that

How to cite this Article: Mahajan, Remia, Gupta, Richa and Bakhshi, Arti (2017). Personality, loneliness and subjective well-being as predictors of problematic mobile phone usage. *Internat. J. Appl. Soc. Sci.,* **4** (11 & 12) : 472-482.

prevalence of mobile addiction in India is too high about 39-44% among the mobile users (Davey and Davey, 2014), it is an issue of global concern that should be addressed soon.

Personality and mobile phone use :

Personality and situation interact to produce behaviour, so any kind of problematic behaviour could be attributed to individual differences on the account of their unique personalities. Studies have shown that people who were addicted to mobile phones were low in self-esteem, extraversion, high approval motivation, and high self monitoring (Bianchi and Phillips, 2005; Takao *et al.*, 2009) all of which are personality features. In this study we examined the role of big five personality domains: openness-to-experience, conscientiousness, extraversion, agreeableness and neuroticism in predicting problematic use of mobile phones. Researchers have shown that various behavioural addictions are strongly related to these domains (Andreassen *et al.*, 2012; Sherman, 2011; Landers and Lounsbury, 2006; Terracciano *et al.*, 2008), so it conceived that problematic mobile phone users exhibit personality characteristics in the big five domains.

Loneliness and mobile phone use:

According to Wei and Lo (2006), loneliness could be defined as "a self-perceived state that a person's network of relationships is either smaller or less satisfying than desired". So loneliness is not a matter of external conditions rather it is a psychological state. In recent years loneliness and mobile phone addiction have been studied by various researchers (Jin and Park, 2013; Reid and Reid, 2007; Takao *et al.*, 2009; Wei and Lo, 2006). With the growing technological inventions, face-to-face interactions have decreased manifolds. Jin and Park (2013) found that more face-to-face interactions were associated with lower levels of loneliness; however, more cell phone calling was associated with greater loneliness. Reid and Reid (2007) revealed that lonely people preferred calls and rated text such as short message service (SMS, or text messaging) as a less intimate method of contact. According to Takao *et al.* (2009) it is conceivable that lonely people are eager to maintain contact with their peers through frequent calls so as to fulfil their loneliness. Therefore it is assumed that problematic mobile phone use is predicted by loneliness.

Subjective well-being and mobile phone use :

Subjective well-being (SWB) is the global evaluation of individual's life quality. As mobile phone usage could be considered as "social" as its features help one to interact with others via calls, texting, video chats, social networking sites, etc., which could translate into meaningful relationships and involvement in community, so it could affect SWB (Diener and Seligman, 2004). This paper uses life satisfaction as an indicator of individual SWB, which refers to individuals 'perceptions of their life quality in terms of their goals and aspirations. Previous studies have found that mobile phone use is positively linked to bridging and bonding social capita (Ling, 2004; Wei and Lo, 2006; Campbell and Kwak, 2010). On the contrary, studies have shown that excessive use of mobile phone reduced the quality and intimacy of face-to face relationships (Turkle, 2011), health related problems like fatigue, headaches, dizziness, etc. (Choi *et al.*, 2014), negative affect (Chan, 2015), anxiety (Hong *et al.*, 2012),

stress (Lee *et al.*, 2014), depression (Lu *et al.*, 2011) and lower life satisfaction (Lepp *et al.*, 2014). So, it is expected that life satisfaction will predict problematic use of mobile phones.

Demographics and mobile phone use :

In uptake of any kind of new technology, there appeared to be gender differences. Past research has found that men had a positive attitude towards computers, but with changing times women were found to be having favourable attitude towards computers (Ray *et al.*, 1999). Significant gender differences in behaviours associated with mobile-phone addiction have been reported (Roberts *et al.*, 2014). Women are more likely to develop addictive mobile behaviour than men who experience less social stress than women and use their mobiles less for social purposes. Differences in age cohorts were also found to be significant where older people are less likely to develop addictive mobile behaviour because of different social usage and stress and greater self-regulation (van Deursen *et al.*, 2015).

Hypothesis of the study :

H1: Personality, loneliness and SWB will significantly predict mobile phone addiction.

H2: There will be significant differences in mobile addiction with regard to gender and age.

METHODOLOGY

Sample :

The sample was recruited using purposive sampling and extracted from schools and colleges of Jammu city. The present sample consisted of older adolescents (18-19 years, N=75) and young adults (20-24 years, N=75), M= 20.01, S.D. =1.33. The sample consisted of 90 females and 60 males who had their personal smart phones with internet connectivity and were using them for as a minimum last six months with minimum one hour spent on mobile phone on an average day.

Procedure :

Participants were contacted by going to different educational institutions which contained consent form that described their rights as research participants. Those participants who agreed to participate were included in the sample and survey questionnaire was administered to them containing questions regarding their demographics, personality, loneliness and SWB.

Instruments :

Demographic profile gauging the age, gender, number of siblings, educational level and academic performance for last 4 years. Only age and gender were used in the current study. Open-ended questions regarding *mobile phone usage* were also asked, like time spent on mobile phone on an average day, number of close friends listed in mobile contact lists, and type of handset.

The 10-Item Big Five Inventory (BFI-10; Rammstedt and John, 2007) :

It is a short scale version of the well-established Big Five Inventory (BFI; John, Donahue,

and Kentle, 1991; Benet-Martínez and John, 1998) consisting of ten of the 44 standard BFI items. It allows assessing the Big Five (Openness to experience, conscientiousness, extraversion, agreeableness and neuroticism) by only two items per dimension, one keyed in the positive and one in the negative direction. All items used five-point Likert-type response options ranging from fully agree to fully disagree. All ten items were re-coded for the present analyses so that fully disagree was scored as 1 and fully agree as 5. For the present study, Cronbach's alpha coefficient for BFI-10 was .79.

Emotional and Social Loneliness Scale (ESLS; Wittenberg, 1986, cited in Shaver and Brennan, 1991) :

It consists of 10 items (five of which are reverse scored) which are answered on a 5-point scale ranging from 1 = strongly disagree to 5 = strongly agree to measure emotional loneliness and social loneliness. The ESLS has good levels of reliability and validity (Zhao, Kong, and Wang, 2012). In this study, Cronbach's alpha coefficient for the ESLS was .84.

The satisfaction with life scale *(SWLS; Diener et al., 1985)* :

Developed by Diener *et al.* (1985), this 5-item scale of life satisfaction is most widely-used measures in psychology to assess life satisfaction as a cognitive judgmental process or global cognitive judgment of one's life. The SWLS has high levels of internal consistency and temporal reliability (Pavot *et al.*, 1991). The instructions for SWLS ask participants to rate the following five statements on 7-point Likert-type scales. Respondents were asked their level of agreement using a 6-point scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). The maximum possible score is 35 with higher score indicative of higher life satisfaction. For the current sample the Cronbach's alpha reliability was .66.

Problematic use of mobile phones (PUMP Scale; Merlo *et al.*, 2013) :

It is a 20 item self reported scale measuring problematic use of mobile phones. The (α = .94) and convergent validity when compared to measure of cellular phone dependency [the CPDQ, Toda *et al.*, 2004). It reports problematic use of mobile phone on ten dimensions: tolerance, withdrawal, longer time than intended, great deal of time spent, craving, activities given up/ reduced use despite physical/psychological problems, failure to fulfil role obligations, use in physically hazardous situations and use despite social or interpersonal problems. All items were rated on a 5-point scale ranging from 1 = "strongly disagree" to 5 = "strongly agree." The cronbach's alpha for the current sample came out to be .72.

RESULTS AND DISCUSSION

Phase 1: Coding and categorizing :

Before proceeding with the analysis, the gender of the respondents was coded as '1' for 'males' and '2' for 'females'. Another variable 'age_cat' was created by grouping the participants according to their ages into the two categories: (1) 18-19 years (older adolescents), coded as '1'and (2) 20-24 years (young adults), coded as '2'. This is done to test the second hypothesis.

Table 1 : Depicts mean and standard deviation of variables under study (n=150)

Variables	Mean	Std Deviation
Pump	61.0467	4.41677
Extraversion	7.0263	1.67548
Agreeableness	7.4267	1.91548
Conscientiousness	7.2400	1.63715
Neuroticism	7.0596	1.73679
Openness	4.9600	1.18083
Emotional loneliness	6.6667	2.10677
Social loneliness	9.0733	3.18785
Life satisfaction	21.6800	4.28094

Phase 2: Analysis :

Table 1 shows the means, standard deviations and Table 2. shows the inter-correlations of the eight predictor variables.

Table 2 : Inter correlation matrix of variables under study

Variables	1	2	3	4	5	6	7	8	9
PUMP	1	923**	-.357*	-.582**	.929**	.438**	.197*	.876**	-.886**
Extraversion		1	.494**	.670**	-.969**	.278**	-.129	-.837**	.820**
Agreeableness			1	.611**	-.516**	.153*	-.156	-.333**	.472**
Conscientiousness			-	1	-.678	189*	.-175	-.487**	.575**
Neuroticism			-	-	1	-.226**	.152*	.860**	-.848**
Openness				.-	-	1	-.254**	-.129*	.238**
Emotional					-	-	1	.111	-.152*
Loneliness									
Social loneliness						-	-	1	-.827**
Life satisfaction							-	-	1

*p < .05 ** p < .01

Stepwise multiple regression model contained six of the eight predictors and was reached in six steps with two variables (emotional loneliness and agreeableness) excluded. The model was statistically significant, F (6, 143) = 337.90, p < .001, and accounted for approximately 93% of the variance of problematic mobile phone usage (R^2 = .934, Adjusted R^2 = .931). The model explained a significant proportion of variance in problematic mobile phone usage scores indicating that prediction of the criterion variable is accomplished better than can be done by chance. Problematic mobile phone usage was primarily predicted by high levels of neuroticism, low levels of life satisfaction, high levels of social loneliness and high levels of extraversion, and to a lesser extent by high levels of openness and low levels of conscientiousness. The standardized regression coefficients of the predictors on problematic mobile phone usage are shown in Table 3. Neuroticism received the strongest weight in the model followed by life satisfaction, social loneliness, extraversion and openness; conscientiousness received the lowest of the four weights. The prediction suggests that neuroticism and life satisfaction are the most important determinants of problematic mobile

phone usage with social loneliness, extraversion, openness and conscientiousness as relatively moderate indicators of problematic mobile phone usage.

Table 3 : Regression analysis depicting predictors of problematic mobile phone usage

Variables	Beta	Sig
Neuroticism	.446	.001**
Life satisfaction	-.313	.000**
Social loneliness	.246	.000**
Extraversion	.215	.013**
Openness	.154	.026*
Conscientiousness	-.069	.043*
Agreeableness	-.023	.416
Emotional loneliness	.032	.177

*p < .05 ** p < .01

To test the second hypothesis, two separate *t*-test were implied to check the differences in the mean scores on PUMP scale with regard to gender and age (Table 4.)

Results from *t* tests indicated that gender differences were significant for all the dimensions of PUMP scale and overall PUMP score. Scores on *tolerance* were significantly higher for female mobile users (*M*=6.17, *SD*=.85) than male mobile users (*M*=5.86, *SD*=.83), *t*(150)=2.19, *p*=.009. Scores on *withdrawal* were also significantly higher for female mobile users (*M*=7.82, *SD*=1.76) than male mobile users (*M*=6.91, *SD*=.93), *t*(150)=, *p*=5.95. Scores

Table 4 : Comparison of means on ten dimensions of PUMP scale and overall PUMP score between males and females and between older adolescents and young adults

PUMP dimensions	Gender (males=60, females=90)			Age _cat (older adolescents.=75, young adults=75)		
	Males (M,SD)	Females (M,SD)	t-value	Older adolescents (M,SD)	Young adults (M,SD)	t-value
Tolerance	5.86, .83	6.17, .85	2.19**	6.04, 1.07	6.06, .58	.19
Withdrawal	6.91, .93	7.82, 1.76	5.95**	7.12, 1.15	7.52, 1.98	1.51
Longer time than intended	7.09, 1.49	5.73, 1.87	4.91**	6.19. 1.90	6.31, 1.81	.40
Great deal of time spent	5.25, 1.63	7.70, 1.44	9.36**	6.87, 1.86	6.67, 1.99	.64
Craving	6.72, 1.46	6.01, .90	3.30**	6.31, 1.14	6.25, 1.25	.27
Activities reduced	4.61, .88	5.18, 1.11	3.28**	4.79, .89	5.15, 1.19	2.09*
Use despite physical/ psy problems	5.35, 1.11	6.67, 1.13	7.01**	6.20, 1.16	6.13, 1.41	.32
Failure in fulfilling role obligation	5.74, .79	6.40, .92	4.66**	6.15, .90	6.15, .96	.00
Use in hazardous situations	5.96, .84	6.28, 1.01	1.96*	6.23, 1.07	6.09, .84	.85
Use despite social/inter personal problems	4.28, .96	5.38, 1.19	5.88**	4.79, 1.08	5.13, 1.34	.74
PUMP total	57.3, 2.95	63.33, 3.52	10.79**	60.63, 3.76	61.47, 4.98	1.67

*p < .05 ** p < .01

on *great deal of time spent* were also significantly higher for female mobile users (*M*=7.70, *SD*=1.44) than male mobile users (*M*=5.25, *SD*=1.63), *t*(150)=9.36, *p*=.000. Scores on *activities reduced* were also significantly higher for female mobile users (*M*=5.18, *SD*=1.11) than male mobile users (*M*=4.61, *SD*=.88), *t*(150)=3.28, *p*=.007. Again scores on *use despite physical/psychological problems* were also significantly higher for female mobile users (*M*=6.67, *SD*=1.13) than male mobile users (*M*=5.35, *SD*=1.11), *t* (150) =7.01, *p*=.000. Scores on *failure to fulfil role obligation* were also significantly higher for female mobile users (*M*=6.40, *SD*=.92) than male mobile users (*M*=5.74, *SD*=.79), *t*(150)=4.66, *p*=.000. Scores on *use in hazardous situations* were also significantly higher for female mobile users (*M*=6.28, *SD*=1.01) than male mobile users (*M*=5.96, *SD*=.84), *t*(150)=1.96, *p*=.000. Scores on *use despite social/interpersonal problems* were also significantly higher for female mobile users (*M*=5.38, *SD*=1.19) than male mobile users (*M*=4.28, *SD*=.96), *t*(150)=5.88, *p*=.000. On only two dimensions male mobile users scored higher than female mobile users, *longer time than intended* with male users (*M*=7.09, *SD*=1.49) than female mobile users (*M*=5.73, *SD*=1.87), *t*(150)=4.91, *p*=.000 and *craving* with male users (*M*=6.72, *SD*=1.46) than female mobile users (*M*=6.01, *SD*=.90), *t*(150)=3.30, *p*=.000. On overall *PUMP score*, female mobile users scored significantly higher (*M*=63.33, *SD*=3.52) than male mobile users (*M*=57.3, *SD*=2.95), *t*(150)=10.79, *p*= .000 suggesting that mobile use was more problematic for female users as compared to males. The magnitude of the differences in means of two gender was very high (eta squared=0.44).

With regard to age there was no significant difference among mobile users in overall PUMP score. On only one PUMP dimension there was significant difference that was *activities reduced* with young adults scored significantly higher (*M*=5.15, *SD*=1.19) as compared to older adolescents (*M*=4.79, *SD*=.89), *t*=2.09, *p*=.04.

Discussion :

The present study aims to determine the role of big five personality domains, loneliness (emotional and social) and SWB (life satisfaction) in predicting problematic use of mobile phone. Problematic mobile phone use is a function of poor subjective well being, openness to experience, social loneliness, neuroticism, extraversion and conscientiousness but not a function of agreeableness and emotional loneliness. Only gender brought significant differences in the dimensions of PUMP scale and overall PUMP scale score. Age didn't contribute in bringing any significant differences.

Openness to experience was found to be positively related to problematic mobile phone use (r=.438**) which is contradictory to the findings of Takao (2014) who have suggested that there is a negative relationship between the two. The positive results could be due to the fact that the trait of openness to experience predisposes an individual to learn new things, novelty and this curiosity may be driving the mobile phone user to explore various features (new flourishing apps, etc) of this new technology at his/her hands. Also according to Hall (2005) is related to online sociability and larger network size (Quercia *et al.*, 2012), which is possible through their smart phones. The motivation to seek novel stimuli might be causing them to spent longer time on their phones and resulting in the problematic use.

The trait of conscientiousness is found to be negatively related to problematic mobile

phone use (-.582**) as highly conscientious individuals avoid using or totally refrain from using any technology that would distract them from executing their responsibilities (Ryan and Xenos, 2011; Wehrli, 2008). Previous research has also indicated that conscientious people spend more time online, engaging themselves in academic pursuits than in leisure activities (McElroy *et al.*, 2007).

Neuroticism was found to be positively correlated to problematic mobile phone use (r=.929**) which is in line with the study by Takao (2014). As neurotics are anxious in face-to-face interactions, so mobile phones are an excellent medium to communicate and interact as the anxiety level is reduced in digital (via social media) and analogue (via voice calls) presence.

The indicator of SWB, life satisfaction was negatively related to problematic mobile phone use (r=-.886**) which is supported by Chan (2015) and Lepp *et al.* (2014). As excessive use of mobile phones have been related to experiencing of health related symptoms (Choi *et al.*, 2014), anxiety (Hong *et al.*, 2012) and depression (Lu *et al.*, 2011) and stress (Lee *et al.*, 2014), all of which are correlated to well-being of an individual. Also excessive use technology distance one from real world friendships and interactions (Guynn, 2011).

Above reasons could be used to explain social loneliness which was also came out to be a significant predictor and positively correlated with problematic mobile phone use (r=.876**). As technology is known to isolate people (Moody, 2001; Nie, 2001), and interactions formed over some technological media are merely shallow approximations of real relationships resulting in low quality of social network.

With regard to demographics, gender brought significant differences with females being higher in overall PUMP score as compared to males, which is in line with the study by Roberts *et al.* (2014), who suggested that females spent higher amount of time on social networking sites, sending e-mails and scored significantly higher on cell phone addiction scale as compared to men. As the current study used younger population and excluded comparatively older population which might have brought insignificant results in the context of age differences on problematic mobile phone use.

Conclusion :

The findings of this study led to the conclusion that the problematic use and addictive tendencies towards mobile phones could be traced to personality, loneliness and well-being of individuals. Although mobile phones are boon as a communication media and good avenue to pass time, but its cautious use is recommended.

Limitations and suggestions for future research :

This study also has its limitations. The sample size was small and the adult and older population was not included in the study, which might give more valuable information. Variables related to mobile phone use were not studied, like amount of time spent, motives, favourite and most used apps, etc., which might be used in establishing important associations. Loneliness and well-being were studied as causes for problematic use of mobile phone, which could be effect also. So researchers could draw upon the current findings and work on the given limitations in their future work.

REFERENCES

Andreassen, C.S., Torsheim, T., Brunborg, G.S., and Pellesen, S. (2012). Development of a facebook addiction scale. *Psychological Reports*, **110**(2) : 501-517.

Benet-Martinez, V. and John, O. (1998). Los Cinco Grandes across cultures and ethnic groups: Multitrait-multimethod analyses of the Big Five in Spanish and English. *J. Personality & Soc. Psychol.*, **75**(3) : 729–750.

Bianchi, A. and Phillips, J.G. (2005). Psychological predictors of problem mobile phone use. *Cyber Psychology & Behavior*, **8**(1) *:* 39-51.

Campbell, S.W. and Kwak, N. (2010) Mobile communication and social capital: An analysis of geographically differentiated usage patterns. *New Media & Society*, **12**(3) : 435-451. doi: 10.1177/1461444809343307.

Chan, M. (2015). Mobile phones and the good life: Examining the relationships among mobile use, social capital and subjective well-being. *New Media & Society*, **17**(1) : 96-113. doi: 10.1177/1461444813516836

Choi, S.B., Kwon, M.K., Chung, J.W., Park, J.S., Chung, K.S. and Kimet, D.W. (2014). Effects of short-term radiation emitted by WCDMA mobile phones on teenagers and adults. *BMC Public Health*, **14** : 438. doi:10.1186/1471-2458-14-438

Davey, S. and Davey, A. (2014). Assessment of smart phone addiction in Indian adolescents: A mixed method study by systematic-review and meta-analysis approach. *Internat. J. Preventive Medicine*, **5**(12) : 1500–1511.

Diener, E., Emmons, R.A., Larsen, R.J., and Griffin, S. (1985). The Satisfaction with Life Scale. *J. Personality Assessment*, **49**(1) : 71-75.

Diener, E. and Seligman, M.E.P. (2004). Beyond Money: Toward an economy of well-being. *Psychological Science in the Public Interest*, **5**(1) : 1-31. doi: 10.1111/j.0963 7214.2004.00501001.x

Guynn, J. (2011). *Pew report: Facebook users have a higher degree of social well-being*. The Los Angeles Times. Retrieved from http://latimes.com

Hall, A. (2005). Audience personality and the selection of media and media genres. *Media Psychology*, **7**(4) : 377 – 398. doi: 10.1207/S1532785XMEP0704_4.

Hong, F.Y., Chiu, S.I. and Huang, D.H. (2012). A model of the relationship between psychological characteristics, mobile phone addiction and use of mobile phones by Taiwanese university female students. *Computers in Human Behavior*, **28**(6) : 2152-2159.

James, D. (2012). Problematic use of mobile phones: Measuring the behaviour, its motivational mechanism and negative consequences. Doctoral dissertation, Queensland University of Technology, Brisbane, Australia.

Jin, B. and Park, N. (2013). Mobile voice communication and loneliness: Cell phone use and the social skills deficit hypothesis. *New Media & Society*, **15**(7) : 1094-1111.

John, O.P., Donahue, E.M. and Kentle, R.L. (1991). *The Big Five Inventory-Versions 4a and 54*. Berkeley, CA: University of California, Berkeley, Institute of Personality and Social Research.

Landers, R.N. and Lounsbury, J.W. (2006). An investigation of big five and narrow personality traits in relation to internet usage. *Computers in Human Behaviour*, **22**(2) *:* 283-93. doi:10.1016/

j.chb.2004.06.001

Lee, H., Ahn, H., Choi, S. and Choi, W. (2014). The SAMS: Smartphone Addiction Management System and Verification. *J. Medical Systems*, **38**(1) : 1-10.

Lepp, A., Barkley, J.E. and Karpinski, A.C. (2014). The relationship between cell phone use, academic performance, anxiety, and Satisfaction with Life in college students.*Computers in Human Behavior*, **31** : 343–350. doi:10.1016/j.chb.2013.10.049.

Ling, R. (2004). *The mobile connection: The cell phone's impact on society*. San Francisco, CA: Morgan Kaufmann.

Lu, X., Watanabe, J., Liu, Q., Uji, M., Shono, M. and Kitamura, T. (2011). Internet and mobile phone text-messaging dependency: Factor structure and correlation with dysphoric mood among Japanese adults. *Computers in Human Behavior*, **27**(5) : 1702-1709. doi:10.1016/j.chb.2011.02.009.

McElroy, J.C., Hendickson, A.R., Townsend, A.M. and DeMarie S.M. (2007). Dispositional factors in internet use: Personality versus cognitive style. *MIS Quaterly*, **31**(4) : 809-820.

Merlo, L.J., Stone, A.M. and Bibbey, A. (2013). Measuring Problematic Mobile Phone Use: Development and Preliminary Psychometric Properties of the PUMP Scale. *J. Addiction*, 1-7. doi: 10.1155/2013/912807.

Moody, E.J. (2001). Internet use and its relationship to loneliness. *Cyber Psychology & Behavior*, **4**(3) : 393-401. doi:10.1089/109493101300210303.

Nie, N.H. (2001). Sociability, interpersonal relations, and the internet: Reconciling conflicting findings. *American Behavioral Scientist*, **45**(3) : 420-435. doi: 10.1177/000 27640121957277.

Pavot, W.G., Diener, E., Colvin, C.R. and Sandvik, E. (1991). Further validation of the satisfaction with life scale: Evidence for the cross-method convergence of well-being measures. *J. Personality Assessment*, **57**(1) *:* 149–161. doi: 10.1207/s1532775 2jpa5701_17.

Quercia, D., Lambiotte, R., Stillwell, D., Kosinski, M. and Crowcroft, J. (2012). The personality of popular facebook users. In *Proceedings of the ACM 2012 conference on computer supported cooperative work* (pp. 955-964).

Rammstedt, B. and John, O.P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *J. Res. Personality*, **41**(1) : 203–212. doi:10.1016/j.jrp.2006.02.001.

Ray, C.M., Sormunen, C. and Harris, T.M. (1999).Men's and women's attitudes toward computer technology: A comparison. *Information, Technology, Learn-ing & Performance J.*, **17**(1) : 1–8.

Reid, D. J. and Reid, F.J.M. (2007). Text or talk? Social anxiety, loneliness, and divergent preferences for cell phone use. *Cyber Psychology & Behavior*, **10**(3) : 424–35. doi: 10 .1089/cpb.2006.9936.

Roberts, J., Yaya, L. and Manolis, C. (2014). The invisible addiction: Cell-phone activities and addiction among male and female college students. *J. Behavioral Addictions*, **3**(4) : 254-265. doi: 10.1556/jba.3.2014.015.

Ryan, T. and Xenos, S. (2011). Who uses Facebook? An investigation into relationship between the Big Five, shyness, narcissism, loneliness, and Facebook use. *Computers in Human Behavior*, **27**(5) : 1658-1664. doi:10.1016/j.chb.2011.02.004.

Shaver, P.R. and Brennan, K.A. (1991). *Measures of depression and loneliness.* San Diego,CA: Academic

Press.

Sherman, E. (2011). *Facebook Addiction: Factors influencing an individual's addiction.* (Master'sthesis, University of Massachusetts, Boston).

Takao, M. (2014). Problematic mobile phone use and big-five personality domains. *Indian J. Community Medicine*, **39**(2) : 111-113. doi: 10.4103/0970-0218.132736http://en.wikipedia.org/wiki/PubMed_Identifier

Takao, M., Takahashi, S., and Kitamura, M. (2009). Addictive personality and problematic mobile phone use. *CyberPsychology & Behavior*, **12**(5) : 501-507. doi:10.1089/cpb.20 09.0022.

Terracciano, A., Lockenhoff, C.E., Crum, R.M., Bienvenu, O.J. and Costa, P.T. Jr. (2008). Five-factor model personality profiles of drug users. *BMC Psychiatry*, **11** : 8-22. doi: 10.1186/1471-244X-8-22.

Toda, M., Monden, K., Kubo, K. and Morimoto, K. (2004). Cellular phone dependence tendency of female university students. *Japanese J. Hygiene*, **59**(4) : 383–386. doi: 10.1265/jjh.59.383.

Turkle, S. (2011). *Alone together: Why we expect more from technology and less from each other.* New York, NY: Basic Books.

van Deursen, A.J., Bolle, C.L., Hegner, S.M. and Kommers, P.A. (2015). Modeling habitual and addictive smartphone behavior: The role of smartphone usage types, emotional intelligence, social stress, self-regulation, age, and gender. *Computers Human Behavior*, **45** : 411-420. doi:10.1016/j.chb.2014. 12.039.

Wehrli, S. (2008). Personality on social network sites: An application of the five factor model. (ETH Zurich Sociology Working Paper No.7). Retrieved from http://repec.ethz.ch/ets/papers/wehrli_studivz_big 5. pdf

Wei, R. and Lo, V.H. (2006). Staying connected while on the move: Mobile phone use and social connectedness. *New Media & Society*, **8**(1) *:* 53– 72. doi: 10.1177/14614448060 59870.

Wittenberg, M.T. (1986). Emotional and social loneliness: An examination of social skills, attributions, sex roles and object relations perspectives. Unpublished doctoral dissertation, University of Rochester, Rochester, NY.

Zhao, J., Kong, F. and Wang, Y. (2012). Self-esteem and humor style as mediators of the effects of shyness on loneliness among Chinese college students. *Personality & Individual Differences*, **52**(6) : 686–690. doi:10.1016/j.paid.2011.12.024.

****