*Research Article*

# The Role of Personality and Psychological Needs on the Problematic Internet Use and Problematic Social Media Use

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## Abstract

Current study investigates the relationships among personality characteristics, psychological needs, problematic Internet use and problematic social media use. A theoretical model was specified, estimated, and evaluated based on the data collected from 436 college students (Mean Age = 20.93 years, SD = 2.11 years). First, structural equation modeling approach was used to validate the research model. The model suggests that personality has significant direct and indirect effects on problematic Internet use but it has only a significant indirect effect on problematic social media use through psychological needs. Further, there is also a significant direct effect of psychological needs on both problematic Internet use and problematic social media use. An increase in neuroticism, extraversion, openness, agreeableness, and conscientiousness leads to an increase in dominance, autonomy, affiliation, and achievement, whereas an increase in psychological needs leads to a decrease in problematic Internet use and problematic social media use. Implications of the findings are discussed for theory and practice in cyberpsychology.

## Keywords

Personality • Psychological needs • Problematic Internet use • Social media

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Problematic Internet use (PIU) is described as impairments to one's personal, social, or occupational lifecycle due to the disproportionate use of the Internet (Beard, 2005). Besides, social networking sites (SNS) have recently become an integrated part of our lives. On the positive side, SNS provide less-threatening environments for social interactions (Morahan-Martin, & Schumacher, 2000). However, the problematic uses of SNS may be associated with various personal and social problems (Kuss & Griffiths, 2011). Hence, an increasing focus on PIU and SNS is evident in contemporary literature (e.g., Baggio, Iglesias, Berchtold, & Suris, 2016; Carbonell & Panova, 2017; Kim & Kastag, 2018; Lin, 2015; Moretta & Buodo, 2018; Škařupová, Ólafsson, & Blinka, 2015; Wang, Tao, Fan, Gao, & Wei, 2016).

In most general terms, personality can be framed as enduring patterns of thoughts, feelings, and behaviors that distinguish an individual from others (McCrae & Costa, 2003), which impacts one's attitudes, beliefs, goals, and needs (Devaraj, Easley, & Crant, 2008). Although personality is theorized in various ways, one conventional approach to personality is the five-factor model known as the Big Five (Costa & McCrae, 2003). This model consists of five personality structures as neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness (McCrae & Costa, 1999). In recent years, the Big Five has been investigated in relation to the Internet and SNS (e.g., Casale & Fioravanti; 2018; Chou & Chiu, 2015; Diana & Xavier, 2014; Stead & Bibby, 2017; Zhou, Li, Li, Wang, & Zhao, 2017).

Influenced by the personality-related and socio-cultural dynamics (Greenaway, Cruwys, Haslam, & Jetten, 2015), human needs are hierarchical and circular (Maslow, 1943) and may epitomize themselves in different forms and under many circumstances, including the Internet and SNS (Bannon, McGlynn, McKenzie, & Quayle, 2015; Deng, Fang, Wan, Zhang, & Xia, 2012; Islam et al., 2018). Individuals with different personality traits tend to develop varying psychological needs and satisfy those needs in various ways (Lundin et al., 2014; Ryan & Deci, 2008). In contemporary era, the Internet and SNS have become available channels through which people seek to satisfy their psychological needs (Casale & Fioravanti, 2015; Liu, Fang, Wan, & Zhou, 2016; Wang, Tchernev, & Solloway, 2012; Zolkepli & Kamarulzaman, 2015).

In sum, current literature indicates promising relationships among PIU, problematic social media use, personality, and psychological needs. However, we have encountered limited research studying these constructs in an integrated context. Therefore, the purpose of the current study is to predict PIU and problematic social media use from the Big Five personality components and psychological needs based on a structural equation model derived from the theory and backed by recent research.

## Literature Review

There has been a revival of interest on the five-factor model in relation to the Internet and SNS. For example, Wang, Jackson, Zhang, and Su (2012) investigated the relationships between the Big Five and the use of specific features of SNS among 265 Chinese college students. They found that extraverts were more likely to use SNS for commenting, status updating, and making new friends whereas neurotics were more likely to use them for self-expression. Individuals who had higher levels of self-esteem and were more agreeable were found to comment more on others' profiles. Diana and Xavier (2014) studied the relationship between the Big Five and PIU in a sample of 411 Colombian youngsters. Their results showed that PIU correlated positively with neuroticism but negatively with higher conscientiousness and extraversion. In another study, Kim and Chung (2014) investigated whether SNS use affected the relationships between the Big Five and individual job satisfaction among 1452 workers in Korea. They found that SNS use moderated the relationship between extraversion and neuroticism. Chou and Chiu (2015) studied the relationship between the Big Five and SNS use among elementary school students and found a positive relationship between extraversion and SNS use for branding, sharing, learning, and monitoring. In addition, neuroticism had a positive correlation with using SNS for relaxing. Based on current research, the present study investigates the effects of personality characteristics on problematic Internet use and problematic social media use (RQ1).

One's personality characteristics are hypothesized to effect his/her psychological needs, which motivate people in attaining their desires (Dizen, Berenbaum, & Kerns, 2005). Ryan and Deci (2000; 2006) purposed competence, autonomy, and relatedness as basic human needs based on self-determination theory. Heckert et al. (2000) suggested four fundamental psychological needs as achievement, affiliation, autonomy, and dominance. In this context, achievement is related to willingness to take a step further from one's previous performance. Affiliation is associated with desire and aspiration to interact with others. Autonomy is the need of acting and deciding autonomously without being reliant on others whereas dominance is related to the wish to be strong and have an impact on others. The study investigates the relationship between personality characteristics and psychological needs conceptualized by Heckert et al. (2000) (RQ2)

Psychological needs in relation to PIU and problematic social media use have been the focus of a few studies (e.g. Deng et al., 2012; Kesici & Şahin, 2009; Kuss, 2016; Lin, Tov, & Qiu, 2014; Pearson & Hussain, 2016; Ryan, Chester, Reece, & Xenos, 2016). For example, Deng et al. (2012) found that the more adolescents tend to satisfy their needs online, the more they use the Internet. Similarly, Lin et al. (2014) revealed that when individuals' need for emotional expression is increased, they dwell more on SNS. Also, students determined as Internet addicts use the Internet for

social and leisure purposes much more than non-addict group in a study with a group of Turkish sample (Kesici & Şahin, 2009). Overall conclusion of these studies is that the Internet and SNS have become two main domains in which people seek to satisfy their psychological needs.

The current study investigated the direct and indirect effects of the five-factor personality characteristics (i.e., neuroticism, extraversion, openness, agreeableness, and conscientiousness) on PIU (i.e., distraction, impulsiveness, loneliness, and social comfort) and problematic social media use (i.e., habits and tolerance) via psychological needs (i.e., dominance, autonomy, affiliation, and achievement needs). Thereby, the study investigates significant indirect effects of personality via psychological needs on problematic Internet and social media use (RQ3).

## Method

### Study Group

Using convenience sampling method, we reached 436 college students who were enrolled in classes in a central state university in Turkey. Of the group, 58.72% were women (256) and 41.28% were men (180). Participants' ages varied between 17 and 33 years (mean age = 20.93 years; standard deviation = 2.11 years). In the study, there were 136 freshmen (31.19%), 117 sophomores (26.85%), 105 juniors (24.08%), and 78 seniors (17.88%). Participants came from various study majors such as counseling ($n = 62$), pre-school teaching ($n = 58$), special education ($n = 53$), elementary education ($n = 55$), foreign languages ($n = 55$), computer sciences ($n = 54$), physical sciences ($n = 48$), and social studies ($n = 51$).

### Instruments

**The Adjective-Based Personality Test (ABPT).** The ABPT used to assess the Big Five personality characteristics of the study participants. The test was developed by Bacanlı, İlhan, and Aslan (2009) and includes 40 Likert-type items under 5 subscales (i.e., Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience), which account for 52.63% of the variability among the items. The validity and reliability of the test were found to be adequate (Bacanlı et al., 2009).

**The New Needs Assessment Questionnaire (NNAQ).** The NNAQ was developed to measure the psychological needs of individuals. The higher scores on the sub-dimensions refer to higher levels of psychological needs in that respected subscale. In current study, the scale was used to evaluate various psychological needs of participants. Twenty Likert-type items containing 4 subscales (i.e., Achievement, Affiliation, Autonomy, and Dominance) were developed by Heckert et al. (2000) to assess basic human needs. The

questionnaire was adapted into Turkish by Kesici (2008). In the adaptation process, confirmatory factor analysis indicated that factor structure was similar to the original factor structure ($\chi^2$/df = 3.15, RMSEA=.10, GFI= .76).

**The Problematic Use of Social Network Scale (PUSNS).** The PUSNS evaluates the problematic and unhealthy use of social networks (Özteke, Kesici, Ekşi, Dilmaç, & Doğan, 2015). The higher scores obtained from the scale refer to more problematic use of SNS. The PUSNS is a 20 item, 5- point Likert-type instrument with two subscales: Habit and Tolerance. Confirmatory factor analysis showed a 2-dimensional structure ($\chi^2$/df = 2.22, RMSEA = .05, SRMR = .004, CFI = .91, IFI = .91, GFI = .99, and AGFI = .99). Cronbach's alpha internal consistency of the scale's items was found to be .92.

**The Online Cognitions Scale (OCS).** Davis, Flett, and Besser (2002) developed the original OCS and Keser-Özcan and Buzlu (2005) adapted the scale into Turkish. The scale was developed to measure the problematic use of Internet among individuals. The scale consists of 36 Likert-type items with 4 subscales (i.e., Social Comfort, Loneliness-Depression, Diminished Impulse Control, and Distraction). Confirmatory factor analysis revealed that the Turkish version was highly similar to the original scale ($\chi^2$/df = 0.42, GFI=0.99, CFI=1.0, RMSEA = 0.01) (Keser-Özcan & Buzlu, 2005). Reliability investigations of the adapted scale show high coefficients: .93 for test-retest and .87 for internal consistency (Keser-Özcan & Buzlu, 2005).

**Procedure**

Human Subjects Committee approval had been received before we started the data collection procedure. Students were recruited in their classes and informed about the study. All participants signed an informed consent form and administrations were completed in classes. In order to test the effects of personality through psychological needs on PIU and problematic social media use, 4 measurement models and a structural model were specified, identified, estimated, and tested. Parameter estimates were based on the maximum likelihood (ML) method. The evaluation of model fit tested a null hypothesis of no difference between the model-implied covariance matrix and the observed covariance matrix.

## Results

### Data Screening

Univaraite and multivariate data screening were performed before the main analyses. Multivariate outliers were investigated by Mahalanobis distance at $p <$ .001. Cases with Mahalanobis distances greater than $\chi^2 (15) = 37.70$ were regarded as a multivariate outliers (Mahalanobis, 1936). Results showed that a total of 19 cases exceeded Mahalanobis distance 37.70 ($p < .001$). The comparison of outliers and normally distributed cases did not show statistically significant differences ($p > .05$); therefore, these cases were eliminated from further analyses.

Mardia's multivariate kurtosis and its normalized estimate (Mardia, 1974) were used to investigate multivariate normality. Mardia's multivariate kurtosis was found to be 31.55 and its normalized estimate was 14.26. Finally, the homogeneity of variances was tested using Box's M statistics at $p < .001$. The homogeneity of variances was found to be 161.45, $F = 1.29$, $p > .001$.

### Common Method Bias

Common method bias was screened by Harman's one-factor test (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). All endogenous and exogenous variables were subjected to an exploratory factor analysis (EFA), using unrotated principal components factor analysis, principal component analysis with varimax rotation, and principal axis analysis with varimax rotation. Results and the scree plot showed the presence of more than one factor. In addition, confirmatory factor analysis (CFA) showed that the one-factor model did not fit the data well ($\chi^2/df = 24.42$, GFI = .53, NFI = .38, IFI = .39, CFI = .38, RMSEA = .24, 90% CI for RMSEA = .23 -.25). Therefore, common method bias was not a problem in the study.

### Descriptive Results

Means, standard deviations, and correlation coefficients, for the Big Five factors, psychological needs, PIU, and problematic social media use are given in Table 1. Students scored the highest on agreeableness and lowest on conscientiousness. The most dominant psychological need among students was achievement and the least was autonomy. Students have the highest PIU scores on social comfort and the lowest on loneliness. Finally, their habit scores were higher than tolerance on problematic social media use. The highest inter-correlation was between openness (personality) and the need of achievement ($r = .49$, $p < .05$).

Table 1

*Means, Standard Deviations, Skewness/Kurtosis, and Correlation Coefficients, for Personality Characteristics, Psychological Needs, Problematic Internet Use, and Problematic Social Media Use*

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Correlations | | | | | | | | | |
| Neuroticism (1) | - | | | | | | | | | | | | | | |
| Extraversion (2) | .50 | | | | | | | | | | | | | | |
| Openness (3) | .55 | .68 | | | | | | | | | | | | | |
| Agreeableness (4) | .65 | .39 | .60 | | | | | | | | | | | | |
| Conscientiousness (5) | .50 | .61 | .55 | .43 | | | | | | | | | | | |
| Dominance (6) | .23 | .38 | .46 | .25 | .27 | | | | | | | | | | |
| Autonomy (7) | .15 | .18 | .26 | .14 | .18 | .30 | | | | | | | | | |
| Affiliation (8) | .29 | .28 | .38 | .34 | .25 | .40 | .42 | | | | | | | | |
| Achievement (9) | .47 | .39 | .49 | .46 | .35 | .46 | .42 | .54 | | | | | | | |
| Distraction (10) | -.17 | -.04 | -.15 | -.27 | -.10 | -.06 | .05 | -.07 | -.16 | | | | | | |
| Impulsiveness (11) | -.23 | -.05 | -.15 | -.37 | -.07 | -.03 | .03 | -.09 | -.23 | .66 | | | | | |
| Loneliness (12) | -.14 | -.02 | -.14 | -.28 | -.02 | -.01 | .06 | -.06 | -.12 | .57 | .75 | | | | |
| Social Comfort (13) | -.19 | -.04 | -.14 | -.32 | -.03 | -.03 | -.01 | -.07 | -.19 | .61 | .72 | .69 | | | |
| Habits (14) | -.15 | -.08 | -.10 | -.18 | -.04 | -.05 | .01 | -.08 | -.18 | .35 | .48 | .45 | .38 | | |
| Tolerance (15) | -.16 | -.02 | -.10 | -.16 | -.01 | .05 | .05 | -.06 | -.16 | .36 | .48 | .45 | .38 | .91 | - |
| Means (M) | 37.77 | 48.01 | 45.16 | 51.35 | 36.81 | 16.96 | 18.68 | 18.45 | 20.28 | 17.84 | 22.52 | 11.86 | 27.41 | 23.56 | 16.49 |
| Std. Deviations (SD) | 4.67 | 6.47 | 6.21 | 6.55 | 4.99 | 3.16 | 3.22 | 2.68 | 3.16 | 8.44 | 10.18 | 6.20 | 12.33 | 10.48 | 7.85 |
| M/# of items | 5.40 | 5.33 | 5.65 | 5.71 | 5.26 | 3.92 | 3.73 | 3.69 | 4.06 | 2.55 | 2.23 | 1.98 | 2.11 | 1.96 | 2.06 |

$r > .10, p < .01; r = .10, p < .05; r < .10, p > .05.$

**Measurement Models and the Structural Model**

Model fit for the measurement models and the structural model were evaluated according to the criteria of $\chi^2$/df < 3 (Kline, 2005); Goodness of Fit Index (GFI) ≥ .90 (Hair, Tatham, Anderson, & Black, 2006); Adjusted Goodness of Fit Index (AGFI) ≥ .80 (Marsh, Balla, & McDonald, 1988); Normed Fit Index (NFI) ≥ .90 (Hair et al., 2006); Non-Normed Fit Index or Tucker-Lewis Index (NNFI or TLI) ≥ .90 (Bentler & Bonett, 1980); Comparative Fit Index (CFI) ≥ .90 (Bentler, 1990); Incremental Fit Index (IFI) ≥ .90 (Bollen, 1989) and Root Mean Square Error of Approximation (RMSEA) < .08 (Hair et al., 2006). Standardized regression weights were computed to assess variable loadings. Regression weights were tested at $p < .05$.

All measurement models and the structural model show acceptable fit as indicated by incremental and absolute fit indexes (Table 2). In addition, as Figure 1 shows, several standardized coefficients were statistically significant at $p < .05$.

Table 2
*Model Fit Indices*

|  | Measurement Models | | | Structural Model |
| --- | --- | --- | --- | --- |
|  | *ABPT* | *NNAQ* | *OCS* |  |
| $\chi^2$ | 16.98 | 1.35 | 5.69 | 241.38 |
| df | 3 | 2 | 2 | 82 |
| $\chi^2$/df | 5.66 | .68 | 2.85 | 2.94 |
| GFI | .98 | 1.00 | .99 | .93 |
| AGFI | .92 | .99 | .97 | .89 |
| NFI | .98 | 1.00 | .99 | .93 |
| TLI | .95 | 1.00 | .99 | .94 |
| CFI | .99 | 1.00 | 1.00 | .95 |
| IFI | .99 | 1.00 | 1.00 | .95 |
| RMSEA | .10 | .001 | .07 | .07 |

Note: Because the PUSNS measurement model is full saturated, it shows a perfect fit and therefore not reported here.

Figure 1 shows that all the Big Five personality factors had a significant positive direct effect on dominance, autonomy, affiliation, and achievement (β = .67, $p <$ .001, $R^2$ = .45, df = 82) and a significant negative direct effect on PIU (β = -.18, $p <$ .05). When neuroticism, extraversion, openness, agreeableness, or conscientiousness increased so did the needs of dominance, autonomy, affiliation, and achievement. When neuroticism, openness, or agreeableness increased PIU decreased in all aspects. However, the Big Five personality factors did not have any direct effect on problematic social media use (β = .01, $p$ = .31). In addition, psychological needs had a significant negative direct effect on both PIU (β = -.20, $p < .05$, $R^2$ = .04) and problematic social media use (β = -.12, $p < .05$, $R^2$ = .02). In terms of psychological needs, none but achievement was negatively related to both PIU and problematic social media use.
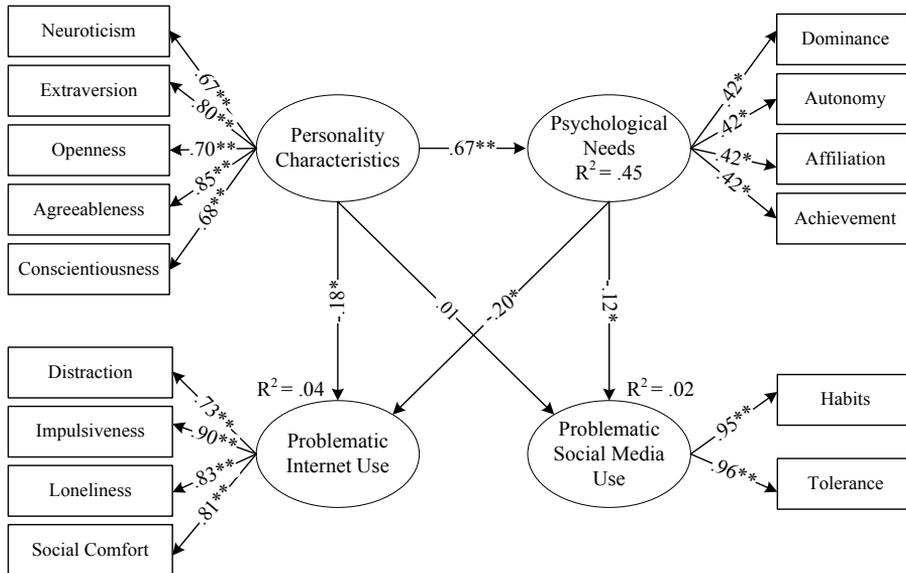
*p < .05, **p < .001, Chi-Square = 241.38, df = 82, Chi-Square/df = 2.94, GFI = .93, RMSEA = .07

*Figure 1.* The structural model of the problematic Internet and social media use.

In sum, we found a significant direct effect of personality on psychological needs (RQ1) and significant direct effects of psychological needs on both PIU and problematic social media use (RQ2). Finally, we found a significant indirect effect of personality via psychological needs on PIU but not on problematic social media use (RQ3).

## Discussion and Conclusions

As an enduring pattern of thoughts and behaviors, personality is a significant variable in social science research. Individuals with various personality characteristics have profound differences in behavioral patterns, tolerance, habits, or needs (e.g., McCrae & Costa, 1999). Moreover, such characteristics may diversify the ways through which individuals gratify their needs. Consequently, individuals with various personality characteristics may have different psychological needs (e.g., Greguras & Diefendorff, 2009) and the relationships between personality and psychological needs are expected to have effects on individuals' online behaviors (Amichai-Hamburger, & Vinitzky, 2010; Chen, Widjaja, & Yen, 2015). Therefore, the current study investigated the direct and indirect effects of the five-factor personality characteristics on PIU and problematic social media use via psychological needs. The results confirmed that (a) the measurement models of the five-factor personality, psychological needs, and PIU fit the data well (Because the PUSNS measurement model was fully saturated, it showed a perfect fit due to zero degrees of freedom); (b) the hypothesized structural model in which personality indirectly affected PIU and problematic social media use

through psychological needs fits the data well; and (c) there was a significant indirect effect of personality characteristics through psychological needs on PIU but not on problematic social media use.

Finding of the current study reported that the explained variance in the outcome variables (i.e., PIU and social media use) is low (4% and 1.4% respectively). Studies addressed the mediating effect of psychological needs between Internet addiction and individualism (Arpaci, Kesici, & Baloglu, 2018) also report similar accounted variability among these factors. Also studies in recent years revealed that some other variables such as loneliness (e.g. Shi, Wang, & Zou, 2017; Tabak & Zawadzka, 2017), social anxiety (e.g. Baloglu, Özteke-Kozan, & Kesici, 2018; Ko et al., 2014) or social support (e.g. Tan, 2018; Wu et al., 2016) were found to be important personality characteristics in problematic Internet use. But in current study only two significant predictors were investigated which may be a reason for the lower explained variance. Moreover, the findings of the present study lead to the interpretation that personality characteristics have a strong effect on psychological needs ($R^2 = 45\%$). Confirming previous findings, the Big Five personality characteristics are found to be related to psychological needs (e.g., Engeser & Langens, 2010; Ryan & Deci, 2008). Participants who scored higher on agreeableness and extraversion also had higher scores on achievement and affiliation needs. Participants who score higher on agreeableness tend to be more helpful, trustworthy, and compassionate and individuals who score higher on extraversion are more social, energetic, and warmer. Therefore, the results of this study may lead to the interpretation that extravert and agreeable people generally have a higher tendency to interact with others (i.e., affiliation) and a need for better performance (i.e., achievement). This suggests that a lower openness, conscientiousness, and neuroticism may increase the needs of achievement, affiliation, dominance, and autonomy.

It can be concluded from the results that extravert and agreeable students use the Internet and social media in order to satisfy their achievement, affiliation, and dominance needs. This suggests that extraverts desire to interact with others and agreeable people display more friendly attitudes, and the Internet may provide an attractive environment for them. Extraverts who are agreeable and who are open to new experiences need higher levels of achievement, affiliation, and dominance, and in turn, they may tend to display less problematic Internet and social media use. Most notably, they may less likely to use the Internet impulsively or develop intolerance or problematic habits in social media. These interpretations also support the findings of Kesici, Şahin, and Thompson (2010) who found that achievement was a significant predictor of PIU and Giota and Kleftaras (2014) who found that social network use increased parallel to the increase in motivation. Thus, in preventing problematic Internet and social media use, counselors, psychologists, families, and teachers need

to focus on psychological needs of their clients. Especially, adolescents and young adults may use the Internet pathologically to gratify their different psychological needs which cannot be satisfied in real life. Hereby, addressing the psychological needs of students in individual or group intervention programs for problematic Internet use may be preffered by practitioners.

Previous research on SNS and psychological needs indicate that SNS are valuable domains to satisfy one's needs (e.g., Lin, Tov, & Qiu, 2014; Sheldon, Abad, & Hinsch, 2011). For example, Greitemeyer, Mügge, and Bollermann (2014) found that Facebook friends and their responses are correlated with psychological needs. Similarly, intrinsic and extrinsic motivations have significantly positive relationships with Internet use (Caniëls, Lenaerts, & Gelderman, 2015). In the present study, personality had a significant effect on problematic social media use through psychological needs. Similarly, Nadkarni and Hofman (2012) suggested belonging and self-presentation as underlying motivations for using Facebook. Yang and Lin (2014) investigated the effects of social, hedonic, and epistemic values on Facebook use and found that hedonic values have a significant effect on Facebook use. In another study, Park and Lee (2014) found that entertainment, relationship maintenance, self-expression, and communication were significantly related to college students' motivations for Facebook use. Therefore, the present findings may be interpreted as the more students' dominance, autonomy, achievement, and affiliation needs are satisfied the less intolerance and problematic habits they develop in using SNS. These findings suggest that satisfying psychological needs in a proper manner is important to prevent behavioral addictions, specifically, among adults.

The prior studies have also found significant relationships between the Big Five traits and online behaviors (e.g., Kim & Jeong, 2015; Wolff & Kim, 2012). For example, Kuo and Tang (2013) found that individuals with high extraversion, openness, and low agreeableness spend more time on Facebook. The study suggested that the higher extraversion, openness, and higher agreeableness might decrease the risk of PIU and problematic social media use. Similarly, Seidman (2013) found that extraverts spend more time on Facebook than those of introverts. Integrating outdoor and leisure time activities in people's lives are one of the most important determinants for the prevention of Internet addiction. Families, professionals, and counselors may regulate these activities according to personality traits of their students.

Finally, results suggest a positive correlation between PIU and problematic social media use. PIU and problematic social media use shared 28% variability. Therefore, we conclude that people who experience problems on the Internet are more likely to experience problems in SNS or vice versa. Similarly, Stieger, Burger, Bohn and Voracek (2013) found that Facebook quitters show higher levels of Internet addiction than

Facebook users. In the same vein, Kittinger, Correia, and Irons (2012) found that people having higher scores on PIU also are more likely to reveal Facebook related problems.

## Limitations

The present study has some limitations. Both PIU and social media use were included as outcome variables in the same model. Rather than becoming addicted to the medium per se, some individuals may develop addiction to specific online activities. Therefore, it can be interesting to test two models, first with PIU and second with problematic social media use as outcome variables. Finally, using self-report questionnaires that subject to individual biases can be listed as a limitation. For future studies using experimental designs, comparing addicted and non-addicted groups or studying the effects with different variables are recommended.

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