INTEGRATING PSYCHOSOCIAL AND COGNITIVE PREDICTORS OF SOCIAL NETWORKING SERVICE ADDICTION TENDENCY USING STRUCTURAL EQUATION MODELING

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This study explored possible paths from psychosocial (i.e., covert narcissism, loneliness, and anxiety) and cognitive (i.e., social self-efficacy and preference for online social interaction) factors to social networking service (SNS) addiction tendency. Survey data collected from 513 college students were analyzed using Structural Equation Modeling (SEM). The final model, which included with covert narcissism, loneliness, social anxiety, social self-efficacy, preference for online social interaction, and interpersonal motives for SNS use as predictors of SNS addiction tendency, resulted in reasonable fit to the data. The results indicate that considering both psychosocial and cognitive variables as predictors of SNS addiction is an effective way to more comprehensively understand the processes through which college students become addicted to SNS. The findings from this study have clinical implications for psychotherapy with clients addicted to SNS.

Key words: SNS addiction, covert narcissism, anxiety, self-efficacy, online social interaction

INTRODUCTION

Research motivation

Social networking service (SNS) has brought changes in how people form and maintain interpersonal relationships. Since the advent of SNS, the sizes of interpersonal networks have expanded to include people who are strangers in an off-line world, and the frequency of online interactions with others whom people already know offline, such as friends and colleagues, has increased. Digital social networks generated through an SNS have become a fast and easy way to learn about old friends’ whereabouts, stay in touch with friends and family, and share everyday lives with others through pictures and writing. Because of SNS, we can interact with people at any time and no matter where we are (Lee, 2011).

Although SNS is a fast and convenient tool for maintaining interpersonal relationships, SNS is not without negative effects. Excessive use could develop into an SNS addiction, which has been known to decrease face-to-face interpersonal interactions, increase the likelihood of vision problems, and deprive people of nighttime sleep (Woo, 2011). Moreover, people’s urges to check what is on social network sites such as Facebook and
Twitter are stronger than the urges to smoke or drink alcohol (Hofmann, Vohs, & Baumeister, 2012). In addition, there is some evidence that students addicted to SNS tend to have difficulties with time management and academic performance (Cho, 2011; Kang, 2013).

Another negative effect of excessive SNS use is that SNS may lead to increased loneliness and depression. Because people can have more control over which relationships to keep and which facets of their lives they will share with others, SNS can be an alternative medium for those individuals with difficulties in real-life relationships. People who are frustrated and angered by real-life relationships could be more drawn to relationships using SNS (Sheldon, 2008). However, overuse of SNS by such people may result in the increased risks of loneliness and depression due to the superficiality of the SNS relationships (Hong, 2015).

Studies conducted on factors associated with excessive SNS use found that extroversion, self-esteem (Hong, 2015; Park, 2014), covert narcissism (Seo & Jo, 2013; Jung, 2014), interpersonal anxiety (Kang, 2014), social anxiety (Im, 2014; U, 2013), depression and loneliness (Jung, 2014; Oh, 2012), and conscience (Kang, 2014; Lee & Go, 2013; Park, 2014; Song & Oh, 2013; Yoon, Kim, & Park, 2014) were related to SNS overuse. Although these findings are helpful in understanding SNS overuse and addiction, more comprehensive research based on systematic approaches is needed to find effective interventions for problematic SNS users.

One systematic approach for studying SNS addiction is a model developed by Park (2013). The model is composed of two sub-models explaining the processes through which some people become addicted to SNS. One sub-model is the repressive/conventional model, which explains that some people having difficulties in real-life relationships are more likely to overuse SNS to compensate for unsatisfying relationships. The other sub-model is the stimulative/instrumental model, which explains that some people who have higher needs for knowledge are more likely to overuse SNS as they constantly search for information. While Park’s (2013) model presents one way to explain why some SNS users are at higher risk of becoming addicted to SNS, the model considers only one factor (i.e., motive for SNS use) associated with SNS addiction and leaves out other psychosocial characteristics of SNS users.

For a more comprehensive understanding of SNS addiction, it is necessary to identify the characteristics of SNS. One common characteristic is that SNS is a medium for communication. SNS is not only an alternative way but also a supplemental way to communicate with others to develop insufficient real-life activities in relationships (Lee, Kim, Oh, & Bae, 2012). Since SNS is an important tool for communicating with others to maintain relationships, psychosocial variables of SNS users’ characteristics must be included in research models studying SNS addiction.

As described above, there are some gaps in the current literature on SNS addiction. First, previous studies have primarily focused on personal characteristics in relation to SNS addiction (Seo & Jo, 2013; Jo, 2014; Oh, 2012; U, 2013). Although these studies contribute to the literature, more studies examining processes through which personal characteristics affect SNS addiction must be conducted to find effective ways to prevent and treat SNS addiction. Additionally, more studies are needed examining protective and risk factors for
SNS addiction.

Second, previous studies mostly examined psychosocial variables (defined, in this study, as psychological factors especially linked to social relationships) in relation to SNS addiction without considering cognitive variables (defined, in this study, as mental factors involved in judgment through the senses and thought processes). To better understand the paths to SNS addiction, cognitive factors (i.e., social self-efficacy and preference for online social interaction) were examined along with psychosocial variables (i.e., covert narcissism, loneliness, and social anxiety) in this study.

Third, each of the sub-motives for SNS use (i.e., information seeking, entertainment seeking, and interpersonal relationship seeking) has not been examined in detail in previous research. Although Park’s (2013) model provided two different explanations for SNS addiction by identifying two motives for SNS use, the model still did not consider both psychosocial and cognitive variables. Thus, this study explored the process through which psychosocial and cognitive predictors could cause SNS addiction tendency.

In summary, this study aimed to explore possible paths from psychosocial (i.e., covert narcissism, loneliness, and anxiety) and cognitive (i.e., social self-efficacy, preference for online social interaction, and interpersonal motives for SNS use) factors to SNS addiction tendency and to extend Park’s (2013) model. Findings from this study are expected to contribute to the development of more effective interventions for those with SNS addiction tendency.

Literature review

Covert narcissism, one of the psychosocial variables, has been found to be associated with Internet addiction (Ahn, 2008; Im, 2012; Lee & Jung, 2007; Son, 2010), SNS addiction tendency (Seo & Jo, 2013; Kang, 2015; Kim, 2008), and smartphone addiction (Lin, 2001). Covert narcissists are uncomfortable in relationships due to high levels of social anxiety. Covert narcissists tend to enjoy showing off through SNS to compensate for unexpressed grandiose fantasies in real life (Kang & Jung, 2002) and could become excessive SNS users (Lee & Jung, 2007).

Loneliness is another important psychosocial factor to examine as a correlate of SNS addiction tendency. Individuals with higher levels of loneliness tend not to be competent in social interactions and feel more confident interacting with others and expressing themselves online than offline (Kim, Jo, Kim, & Bang, 2007; Kim & Lee, 2010). Therefore, loneliness is likely an antecedent to Internet addiction (Ahn, 2008; Lee & Son, 2013), smartphone addiction (Kim, 2012), and SNS addiction (Jung, 2014; Kang, 2013; Lee, Noh, Kwon, & Yi, 2013; Oh, 2012; Park, 2014). Unfortunately, it is possible that lonely individuals’ preference for online social interactions could worsen the situation because excessive SNS use by lonely people could place them at higher risk for social isolation in real life, and the social interaction through SNS might not meet their needs for satisfying relationships (Park, 2014).

Social anxiety is another factor to examine for enhancing the understanding of SNS addiction. Individuals with social anxiety try to avoid direct social contact with others because of the fear of negative feedback from others even though they have needs for
social interaction (Turner, Beidel, Dancu, & Keys, 1986). To make matters worse, social avoidance could have a disruptive influence on everyday life in which social interaction is essential. Especially for college students who are in the developmental phase of expanding their social world, difficulties dealing with everyday social interactions pose a challenge (Park, 2010). According to previous studies with college students and non-student adults (Bae, 2005; H. Y. Lee, 2012; Sheldon, Abad, & Hinsch, 2011), individuals with high levels of interpersonal anxiety or problems in interpersonal relationships tend to prefer online over offline interactions.

In addition to these psychosocial characteristics of individuals, cognitive characteristics related to social situations could be important variables to consider for a better understanding of SNS addiction, because activities through SNS connect individuals with a variety of social groups. Social self-efficacy, preference for online social interaction, and motive for SNS use are cognitive variables examined in the present study for their association with SNS addiction. Recent studies found that these cognitive variables are as important as psychosocial variables for predicting SNS addiction (Davis, 2001; Im, 2014; Lee, Kim, Choi, & Shin, 2014; Lee, Lee, Bak, Kim, & Shin, 2001; Lee & Son, 2013; Son, 2010; Sung, 2012; U, 2013).

Social self-efficacy is a belief that one is capable of creating a favorable impression on others by presenting oneself with the appropriate skills. Social self-efficacy may not directly affect SNS overuse (a cause of social anxiety). However, social self-efficacy was found to mediate the relationship between covert narcissism and social anxiety (Choi & Choi, 2013). Individuals with lower social self-efficacy tend to perceive a higher probability of receiving negative outcomes in the interpersonal domain of life and tend not to be confident that they could effectively deal with negative social situations. These characteristics of individuals with lower social self-efficacy could, in turn, increase social anxiety (Choi & Choi, 2013; Kwon, Shin, & Kim, 2009). Based on the findings that covert narcissism tends to lower social self-efficacy, and social self-efficacy tends to increase social anxiety, social self-efficacy as one of the variables influencing SNS addiction was examined in this study.

Another cognitive variable to consider is the preference for online social interaction. The preference for online social interaction is a tendency to perceive that online spaces are more valuable and important than offline spaces. Individuals preferring online social interaction tend to be dysfunctional in that they use SNS excessively leading to problems in their everyday lives (Caplan, 2003, 2010). Caplan (2003, 2005) found that preference for online social interaction mediated the relationship between loneliness and Internet addiction. Mortan-Martin (2008) also found that preference for online social interaction played an important role in the relationships between problematic Internet use and loneliness and social anxiety.

Lastly, motives for SNS use must also be considered. There are many motives for using SNS including information seeking, entertainment (e.g., games, videos, and music), and habit. In addition, there are interpersonal motives such as interpersonal relationship seeking, loneliness avoidance, and self-affirmation. Previous findings showed that individuals using SNS for self-affirmation and interpersonal relationships were highly
likely to become addicted to SNS and that the most important reason for SNS use among adults, especially college students, was to maintain relationships formed offline (Song & Oh, 2013).

Park (2013) asserted that SNS is a convenient alternative way to alleviate loneliness, no matter where you are and what time it is. Interpersonal motives can readily be activated to use SNS, and using SNS out of such motives could be a strong predictor of SNS addiction. One study seems to support this assertion. U (2013) found that using SNS to avoid loneliness and to seek relationships was the strongest predictor of psychological problems related to Facebook use. Therefore, interpersonal motives for SNS use were added to the research model as a predictor of SNS addiction tendency.

SNS addiction can cause problems for anyone but may have particular consequences for young adults, including college students. Young adults in their twenties must prepare for developmental tasks in their independent lives and for important changes in the near future. In addition, college students tend to be more sensitive to relationship issues than other age groups (Pempek, Yermolayeva, & Calvert, 2009). SNS addiction could interfere with the achievement of developmental tasks. As such, addiction to SNS can have serious negative consequences for this age group. Therefore, it is important to pay special attention to SNS users in this age group (especially college students). Moreover, based on the report that a vast majority of SNS users (90.2%) are in their twenties (Korea Internet & Security Agency, 2013), SNS addiction among college students was the focus of this study.

In sum, the hypothesis model of this study encompasses psychosocial (i.e., covert narcissism, loneliness, and anxiety) and cognitive (i.e., social self-efficacy, preference for online social interaction, and interpersonal motives for SNS use) variables to explain how those psychosocial and cognitive variables are related to SNS addiction tendency.

**Method**

*Participants*

Questionnaires were distributed to 700 college students residing in Seoul, Incheon, Daegu, and Pusan. Six hundred and two questionnaires were answered. Of the 602 questionnaires, 70 were incomplete, and 19 were answered by non-users of SNS and thus excluded from the analysis. The final sample consisted of 513 students (134 male and 379 female), which included 150 first-year students (29.2%), 204 sophomores (39.8%), 88 juniors (17.2%), and 71 seniors (13.8%). Two hundred and twelve of the participants were attending national universities, and 301 were attending private universities. Fifty-two of the participants were from Seoul (10.1%), 302 were from Incheon (58.9%), 59 were from Pusan (11.5%), and 100 were from Daegu (19.5%).

*Measures*

**Questions on demographic characteristics and patterns of SNS use** Questions were asked about demographic characteristics (i.e., gender, grade, and region) and patterns of SNS use (i.e., whether one has SNS accounts, preferred types of SNS, duration of SNS use per day, frequency of access of SNS per day, frequency of writing on SNS, frequency of responding to others’ posting, and the number of friends).

**Covert Narcissism Scale** The Covert Narcissism Scale (CNS; Kang & Jung, 2002) was developed to assess covert narcissism in a non-clinical population based on the “clinical features of the narcissistic personality disorder” (Akhtar & Thomson, 1982). The scale is composed of 45 items answered on a 5-point Likert-type scale. Covert narcissism scores range from 45 to 225, and higher scores indicate higher levels of
covert narcissism. The CNS has five subscales: Need for Acclaim/Fantasy of Grandiose Self (9 items), Exploitation/Self-centeredness (9 items), Goal Instability (9 items), Hypersensitivity/Fragility (10 items), and Timidity/Lack of Self-confidence (8 items). “Need for acclaim/fantasy of grandiose self” represents a need to be the focus of attention, praised and loved, and superior in every way. “Exploitation/self-centeredness” represents being exploitative in relationships, having a sense of entitlement, and being self-centered. “Goal instability” represents having difficulties setting goals, being uncertain about one’s goals, and being uncertain and unsatisfied with one’s identity in career and social settings. “Hypersensitivity/fragility” represents the perception of self as being unhappy and overly sensitive to others’ evaluations. “Timidity/lack of self-confidence” represents lacking courage and confidence and being introverted.

In this study, Cronbach’s α was .93 for the total scale, .83 for the Need for Acclaim/Fantasy of Grandiose Self subscale, .82 for the Exploitation/Self-centeredness subscale, .90 for the Goal Instability subscale, .84 for the Hypersensitivity/Fragility subscale, and .77 for the Timidity/Lack of Self-confidence subscale.

**Loneliness** The UCLA Loneliness Scale (Russell, Peplau, & Cutrona, 1980) adapted to Korean circumstances (Kim & Kim, 1989) was used to measure individuals’ levels of loneliness. The scale consists of 20 items on a 4-point Likert-type scale. Of these 20 items, to minimize bias in responses, 10 ask about respondents’ satisfaction with social relationships, and the other 10 ask about dissatisfaction. Cronbach’s α in this study was .92 for the total scale, .86 for the Satisfaction subscale, and .90 for the Dissatisfaction subscale.

**Social anxiety** The Social Interaction Anxiety Scale (Mattick & Clarke, 1998) adapted to Korean circumstances (Kim, 2001) was used to measure social anxiety. This scale includes 19 items on a 5-point Likert-type scale. Higher scale scores represent higher levels of social interaction anxiety. Cronbach’s α was .92 for the total scale, .86 for the Cognitive subscale, and .85 for the Emotional and Behavioral subscale.

**Social self-efficacy** A modified version (Jo & Lee, 2001) of the Social Self-Efficacy Scale (Jo, Kim, & Won, 1997) was used to measure social self-efficacy. The scale comprises 13 items that form two subscales (i.e., six items for situations of social interactions, and seven items for situations of performing while others watch). The scale assesses self-confidence in one’s capabilities for dealing with social situations on a 5-point Likert-type scale. Higher scores represent stronger social self-efficacy. In this study, Cronbach’s α was .89 for the total scale, .80 for Social Interaction, and .85 for Performance While Being Watched.

**Preference for online social interaction** The Preference for Online Interaction Scale validated by Shin and Lee (in press) was used to measure preference for online social interaction. The scale is a modified version of Caplan’s (2002, 2003) scale and is a single-factor scale with 10 items that assessing the extent to which one perceives online social interactions as comfortable, safe, and effective. Cronbach’s α was .96 in this study. To conduct structural equation modeling (SEM), the 10 items were divided into three parcels (labeled as Preference for online interaction 1, 2, and 3 in Table 2) based on their factor loadings obtained from exploratory factor analysis. By using the factor loadings as a guide (Russell, Kahn, Spoth, & Altmaier, 1998) we were able to generate the parcels equally balanced in terms of the item-to-construct relations.

**Interpersonal motives for SNS use** Three subscales (i.e., Relationship Seeking, Self-affirmation, and Loneliness Avoidance) from the Facebook Use Scale (Oh, 2010) related to interpersonal relationships were selectively used to measure interpersonal motives for SNS use. The Relationship Seeking subscale consists of four items asking whether one uses SNS to keep in touch with others and to feel like a part of social groups. The Self-affirmation subscale consists of three items asking whether one uses SNS to have a presence, to be influential, and to maintain a positive self-image. The Loneliness Avoidance subscale consists of two items. The items are responded to on a 4-point Likert-type scale, and higher scores represent stronger interpersonal motives for SNS use. In this study, Cronbach’s α was .79 for the total scale, .78 for the Relationship Seeking subscale, .78 for the Self-affirmation subscale, and .65 for the Loneliness Avoidance subscale.

**SNS addiction tendency** The SNS Addiction Tendency scale (Seo & Jo, 2013) was used to measure SNS addiction tendency. The 20-item scale consists of three subscales (i.e., Preoccupation with SNS and Withdrawal Symptoms, Excessive Communication and Immersion in SNS Use, and Excessive Time Spent on SNS). Higher scores represent higher levels of SNS addiction tendency. Cronbach’s α was .94 for the total scale, .91 for Preoccupation with SNS and Withdrawal Symptoms, .86 for Excessive Communication and Immersion in SNS Use, and .71 for Excessive Time Spent on SNS.

**Data Analysis**

Data analysis was conducted using SPSS WIN 18.0 and AMOS 18.0. First, descriptive statistics were generated to determine demographic characteristics of the sample, and Cronbach’s alpha coefficients were
calculated to check for internal consistency reliability of the scales.

Second, Pearson’s correlation coefficients were generated to determine the extent to which the variables under examination are related to one another.

Third, SEM was applied to estimate the relationships among the variables affecting SNS addiction tendency. Latent variables were used to estimate the relationships among the variables. Fit indices for the fitted models and path coefficients for the latent variables were calculated.

Fourth, pairwise path coefficients were estimated for the variables in the fitted models to examine whether social self-efficacy, loneliness, social anxiety, preference for online social interaction, and motive for SNS use mediate the relationship between covert narcissism and SNS addiction tendency. In addition, the total, direct, and indirect effects and the extent to which each variable explains the variance of SNS addiction tendency were determined.

Fifth, the bootstrapping method suggested by Shrout and Bolger (2002) was used to check for the level of significance.

RESULTS

Intercorrelations

Bivariate correlation coefficients were generated among all variables (See Table 1). The correlation coefficients that were statistically significant ranged from –.50 to .63 (\( p < .01 \)). SEM with maximum likelihood estimation was used for data analysis; the normal distribution assumptions were satisfied based on a skewness of less than 2 and a kurtosis of less than 7 (West, Finch, & Curran, 1995).

Estimation of the measurement model

The measurement model was estimated with confirmatory factor analysis (see Table 2) to see whether the measurement variables properly measure the latent variables as suggested by Anderson and Gerbing (1988). The results of the estimation revealed an acceptable fit for the model: \( CFI = .932, TLI = .909, RMSEA = .072 \) (90% CI: .066–.077).

<table>
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<tr>
<th>Variable</th>
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<td>.40**</td>
<td>.24**</td>
<td>.30**</td>
<td>–.01</td>
<td>.48**</td>
<td>.63**</td>
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</table>

1 = Covert Narcissism, 2 = Loneliness, 3 = Social anxiety, 4 = Social self-efficacy, 5 = Preference for online social interaction, 6 = Interpersonal motive for SNS use, 7 = SNS addiction tendency
* \( p < .05 \), ** \( p < .01 \), *** \( p < .001 \)
Table 2. Results of confirmatory factor analysis of measurement models.

<table>
<thead>
<tr>
<th>Measurement model</th>
<th>Unstandardized coefficient</th>
<th>S.E.</th>
<th>C.R.</th>
<th>Standardized coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covert Narcissism → Goal Instability</td>
<td>.88</td>
<td>.07</td>
<td>11.96***</td>
<td>.55</td>
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<tr>
<td>Covert Narcissism → Need for Acclaim/Fantasy of Grandiose Self</td>
<td>.79</td>
<td>.06</td>
<td>12.73***</td>
<td>.58</td>
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<tr>
<td>Covert Narcissism → Exploitation/Self-centeredness</td>
<td>.74</td>
<td>.05</td>
<td>12.67***</td>
<td>.58</td>
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<tr>
<td>Covert Narcissism → Hypersensitivity/Fragility</td>
<td>1.31</td>
<td>.06</td>
<td>19.71***</td>
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<td>Covert Narcissism → Timidity/Lack of Self-confidence</td>
<td>1.00</td>
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<td></td>
<td>.75</td>
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<td>Loneliness → satisfaction with social relationships</td>
<td>.87</td>
<td>.04</td>
<td>20.26***</td>
<td>.85</td>
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<td>Loneliness → dissatisfaction with social relationships</td>
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<td>.82</td>
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<td>Social self-efficacy → situations of social interactions</td>
<td>.89</td>
<td>.06</td>
<td>15.59***</td>
<td>.81</td>
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<tr>
<td>Social self-efficacy → situations of performing while others watch</td>
<td>1.00</td>
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<td>Social anxiety → Cognitive</td>
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<td>.03</td>
<td>29.76***</td>
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<td>Social anxiety → Emotional and Behavioral</td>
<td>1.00</td>
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<td>Preference for online social interaction → Preference for online social interaction 1</td>
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<tr>
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<td></td>
<td>.93</td>
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<tr>
<td>Interpersonal motives for SNS use → Relationship Seeking</td>
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<td>.07</td>
<td>12.20***</td>
<td>.68</td>
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<tr>
<td>Interpersonal motives for SNS use → Self-affirmation</td>
<td>1.04</td>
<td>.09</td>
<td>11.99***</td>
<td>.66</td>
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<tr>
<td>Interpersonal motives for SNS use → Loneliness Avoidance</td>
<td>1.00</td>
<td></td>
<td></td>
<td>.69</td>
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<tr>
<td>SNS addiction tendency → Preoccupation with SNS and Withdrawal Symptoms</td>
<td>.83</td>
<td>.03</td>
<td>24.57***</td>
<td>.86</td>
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<tr>
<td>SNS addiction tendency → Excessive Communication and Immersion in SNS Use</td>
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<td>.04</td>
<td>25.71***</td>
<td>.89</td>
</tr>
<tr>
<td>SNS addiction tendency → Excessive Time Spent on SNS</td>
<td>1.00</td>
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<td>.86</td>
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*** p < .001
Estimation of the structural model

Goodness-of-fit and path coefficients Results from the estimation of the structural model revealed a less than acceptable fit: TLI = .872, CFI = .894, RMSEA = .086 (90% CI: .80–.093). Most of the path coefficients, except for the path from social self-efficacy to SNS addiction tendency and the path from loneliness to motive for SNS use were significant (See Fig. 1). A modified model was specified after the non-significant paths were removed.

Estimation of modified model Goodness-of-fit indices for the modified model were within acceptable ranges: TLI = .905, CFI = .934, RMSEA = .075 (90% CI: .68 -.082). The chi-square ($\chi^2$) difference test was performed to see whether there were significant differences between the original and modified models. The $\chi^2$ difference between the two models ($\Delta \chi^2 = 12.74$) was larger than 9.49, which is the critical value for four degrees of freedom. Thus, the modified model was selected (See Fig. 2).

Fig. 1. Structural model for the effects of psychosocial and cognitive variables on SNS addiction tendency.

*p < .05, **p < .01, ***p < .001

Note. Solid lines represent significant paths and dotted lines represent non-significant paths.

Fig. 2. Modified model.

*p < .05, **p < .01, ***p < .001
Estimation of mediation effects

The bootstrapping method (Shrout & Bolger, 2002) was used to test for the mediation effects in the modified model. For bootstrapping, 10,000 simulated data sets generated by resampling with replacement from the original data set (n = 513) were used. The number of iterations was set to 200, and bias corrected method was used. The path coefficients for the indirect effects are presented in Table 2. The indirect effects of covert narcissism on social anxiety (.28), preference for online social interaction (.47) and SNS addiction tendency (.15) were all significant at the probability level of .01. The indirect effects of loneliness on motive for SNS use (.19) and SNS addiction tendency (.23) were significant at the probability level of .01. The indirect effect of social self-efficacy on SNS addiction tendency (.24) and the indirect effects of social anxiety on motive for SNS use (.18) and SNS addiction tendency (.23) were also significant at the probability level of .01. The indirect effect of preference for online social interaction on SNS addiction tendency (.21) was also significant at the probability level of .01. The indirect effect of social self-efficacy on motive for SNS use (.05) was significant at the probability level of .05 while the indirect effect of covert narcissism on motive for SNS use (-.02) was not significant.

Discussion

This study aimed to examine how psychosocial (i.e., covert narcissism, loneliness, and social anxiety) and cognitive variables (i.e., social self-efficacy, preference for online social interaction, and interpersonal motive for SNS use) predict SNS addiction tendency. The modified model was finally selected based on theoretical grounds and statistical significance; it better fit the data than the original model. The final model included covert narcissism, loneliness, social anxiety, social self-efficacy, preference for online social interaction, and motive for SNS use as predictors. These variables resulted in a reasonable fit to the data. The results indicate that the hypothetical model suggested by this study is acceptable as one way to explain SNS addiction tendency.

The direct effects in the final model are summarized and discussed as follows.

First, covert narcissism was found to have a direct effect on social self-efficacy. This result supports previous findings that covert narcissists have lower self-efficacy (Choi & Choi, 2013; Kwon et al., 2009; Park, Shin, & Lee, 2005). Because of the unexpressed fantasies of a grandiose self secretly hidden inside, individuals with higher levels of covert narcissistic tendency set higher standards for themselves and have strong needs for others’ approval. However, such standards and needs are difficult to achieve in reality. Covert narcissists are very likely to experience failure and frustration. Moreover, hypersensitivity is likely to lead covert narcissists to overreact to negative evaluations in social situations. These characteristics of covert narcissistic individuals seem to lower social self-efficacy.

Second, covert narcissism was found to have a significant direct effect on social anxiety. This finding is in line with that of previous studies in which covert narcissism significantly predicted social anxiety (Choi & Choi, 2013; Hwang, 2011; Kang & Kim, 2012). Being hypersensitive and fragile, covert narcissists easily become highly anxious.
### Table 3. Direct, indirect, and total effects of the modified model

<table>
<thead>
<tr>
<th>Paths</th>
<th>Total effect</th>
<th>Direct effect</th>
<th>Indirect effect (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covert Narcissism</td>
<td>Social self-efficacy</td>
<td>-.39***</td>
<td>-.39***</td>
</tr>
<tr>
<td></td>
<td>Loneliness</td>
<td>.63***</td>
<td>.45*** (.09–.29)</td>
</tr>
<tr>
<td></td>
<td>Social anxiety</td>
<td>.72***</td>
<td>.58*** (.10–.20)</td>
</tr>
<tr>
<td></td>
<td>Preference for online social interaction</td>
<td>.30***</td>
<td>-.19* (36–64)</td>
</tr>
<tr>
<td></td>
<td>Interpersonal motive for SNS use</td>
<td>.42***</td>
<td>.27*** (.03–.25)</td>
</tr>
<tr>
<td>Loneliness</td>
<td>Preference for online social interaction</td>
<td>.30***</td>
<td>-.01 (n.s.) (.11–.07)</td>
</tr>
<tr>
<td>Social anxiety</td>
<td>Preference for online social interaction</td>
<td>.30***</td>
<td></td>
</tr>
<tr>
<td>Social self-efficacy</td>
<td>Preference for online social interaction</td>
<td>.30***</td>
<td></td>
</tr>
<tr>
<td>Social self-efficacy</td>
<td>Loneliness</td>
<td>.42***</td>
<td>.27*** (.03–.25)</td>
</tr>
<tr>
<td>Paths</td>
<td>Preference for online social interaction</td>
<td>Interpersonal motive for SNS use</td>
<td>SNS addiction tendency</td>
</tr>
<tr>
<td>-------</td>
<td>----------------------------------------</td>
<td>-------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Loneliness</td>
<td>→</td>
<td>Preference for online social interaction</td>
<td>.50***</td>
</tr>
<tr>
<td>Social anxiety</td>
<td>→</td>
<td>Preference for online social interaction</td>
<td>.35***</td>
</tr>
<tr>
<td>Loneliness</td>
<td>→</td>
<td>Social anxiety</td>
<td>.26***</td>
</tr>
<tr>
<td>Social anxiety</td>
<td>→</td>
<td>Preference for online social interaction</td>
<td>.11*</td>
</tr>
<tr>
<td>Preference for online social interaction</td>
<td>→</td>
<td>Loneliness</td>
<td>.60***</td>
</tr>
<tr>
<td>Interpersonal motive for SNS use</td>
<td>→</td>
<td>Loneliness</td>
<td>.18***</td>
</tr>
<tr>
<td>Preference for online social interaction</td>
<td>→</td>
<td>Interpersonal motive for SNS use</td>
<td>.37***</td>
</tr>
<tr>
<td>Social self-efficacy</td>
<td>→</td>
<td>Preference for online social interaction</td>
<td>.24***</td>
</tr>
<tr>
<td>Loneliness</td>
<td>→</td>
<td>Preference for online social interaction</td>
<td>.24***</td>
</tr>
<tr>
<td>Interpersonal motive for SNS use</td>
<td>→</td>
<td>SNS addiction tendency</td>
<td>.46***</td>
</tr>
<tr>
<td>SNS addiction tendency</td>
<td>→</td>
<td>Interpersonal motive for SNS use</td>
<td>.57***</td>
</tr>
</tbody>
</table>

* p < .05, ** p < .01, *** p < .001
in situations in which they form and maintain interpersonal relationships.

Third, social anxiety was found to have a significant direct effect on loneliness. This finding is consistent with previous findings indicating social anxiety is an antecedent of loneliness (Seo, Kim, Kim, & Jo, 2014). Individuals with higher levels of social anxiety are very likely to experience discomfort in social situations due to their concern about others’ negative evaluation of them. Therefore, they are more likely to experience loneliness.

Fourth, social anxiety and loneliness were found to have a significant direct effect on preference for online social interaction. The finding is in line with previous studies showing that loneliness is one of the critical predictors of preference for online social interaction and is the most powerful predictor of preference for online social interaction among interpersonal variables (Lee & Son, 2013). The finding is also consistent with the report that individuals with higher levels of social anxiety prefer online social relationships due to their fear of negative evaluations from others (Davis, 2001). Loneliness due to difficulties with relationships and offline social anxiety seems to intensify a preference for online social interaction.

Fifth, preference for online social interaction was found to have a significant direct effect on SNS addiction tendency. As presented in a previous study (Caplan, 2005), for individuals having difficulties in interpersonal relationships, online media is an easy alternative for communicating with others. Such individuals are more likely than individuals without interpersonal difficulties to become problematic users. Because non-linguistic messages are limitedly used and linguistic messages are the major contents of interactions in online spaces, those with difficulties in offline relationships are more likely to feel at ease while online and become excessive SNS users.

Sixth, interpersonal motives for SNS use were found to have a significant effect on SNS addiction tendency. This finding is consistent with the previous report that individuals with higher interpersonal motives for SNS use were more likely to become addicted to SNS and to be more heavily influenced by SNS (Rubin & Windahl, 1986). Similarly, other previous studies also suggested that SNS users in their twenties use SNS to maintain relationships with others (Ministry of Science ICT and Future Planning, 2013) and that SNS are used mainly for personal and social purposes. The problem associated with motives for SNS use is that SNS users with interpersonal motives are more vulnerable to becoming excessive users and addicts (Ellison, Steinfield, & Lampe, 2007; Kuss & Griffiths, 2011; Park, 2013; Cheung, Chiu, & Lee, 2010).

The indirect effects in the final model also have implications.

First, it was found that higher covert narcissism and lower social self-efficacy indicated higher social anxiety. This finding is consistent with findings from previous studies on the associations between social self-efficacy and social anxiety (Choi & Choi, 2013; Im, 2005; Kwon et al., 2009; Shin, 2005) and confirms that individuals with higher social anxiety levels have poorer social self-efficacy; that is, individuals perceiving that they are not capable of dealing with threats or dangers in their environment are at higher risk for anxiety and avoidance despite the magnitude of threats or danger. Moreover, individuals with higher levels of social anxiety tend to underestimate others’ positive
feedback on their performance and focus more heavily on the negative aspects. These cognitive tendencies have been reported to lower one’s social self-efficacy.

Second, covert narcissism was not a significant predictor of preference for online social interaction. However, the correlation between the two variables was significant, which indicating a possible suppression effect. The suppression effect may be present in cases in which the mediation effect is significant while the correlation between the independent and dependent variables is not significant or in which the direct effect of an independent variable on the dependent variable is opposite in sign to the indirect effect of an independent variable on the dependent variable through a mediating variable (Cohen, Cohen, West, & Aiken, 2003; Tzelgaw & Henik, 1991). In this study, the relationship between covert narcissism and the preference for online social interaction was positive. However, the direction of each mediator’s (i.e., social self-efficacy, social anxiety, and loneliness) direct effect on preference for online social interaction was not the same. Thus, it may have affected the direction of the effect of covert narcissism on preference for online social interaction, and the direct effects of the mediators or the mediating effect were stronger than the direct effect of covert narcissism on preference for online social interaction. Hypersensitivity, timidity, or lack of self-confidence, which are characteristics of covert narcissism, probably lead covert narcissistic individuals to prefer online social interaction because they have lower social self-efficacy in face-to-face interpersonal situations and higher levels of social anxiety and loneliness (Amichai-Hamburger & Vinitzky, 2010; Jo, 2014; Seo & Jo, 2013; Jung, 2014). Further research is needed on the suppression effect of the mediators.

Third, the direct effect of covert narcissism on interpersonal motives for SNS use was found to be strong, while the indirect effect of covert narcissism on interpersonal motives for SNS use was not significant. This finding is consistent with the results from previous studies finding that individuals with a strong tendency to use others for their own benefit are more likely to use SNS excessively and to become addicted to SNS (Jo, 2014; Seo & Jo, 2013). Covert narcissistic individuals maintain self-esteem through others’ praise and approval. They easily become furious and ashamed of their unmet needs if they do not receive praise and approval. They also do not want to face shameful situations. Therefore, individuals with covert narcissism are more likely to get addicted to SNS due to their strong interpersonal motive for SNS use, which is based on the belief that they can maintain interpersonal relationships with total control.

Fourth, covert narcissism was found to have a direct effect on SNS addiction tendency and an indirect effect on SNS addiction tendency through mediating variables (i.e., loneliness, social anxiety, preference for online interaction, and motive for SNS use). This finding is in line with previous research showing that covert narcissism was related to SNS addiction tendency (Seo & Jo, 2013; Jo, 2014; Jung & Mun, 2015). The direct effect of covert narcissism was the strongest on loneliness and then on social anxiety and motive for SNS use. The indirect effect of covert narcissism on preference for online social interaction was found to be considerably strong.

Fifth, although loneliness had a direct effect on SNS addiction tendency and an indirect effect through social anxiety and preference for online social interaction, the total
effect was not significant. This finding conflicts with previous research in which loneliness was related to SNS addiction tendency and was a powerful predictor of SNS addiction tendency (Kim, Kim, & Choi, 2001; Lee & Son, 2013; Oh, 2012; Park, 2014). Previous findings are based on studies that included a smaller number of variables (e.g., loneliness, depression, and social support in a regression model). However, the present study added more variables including covert narcissism, social anxiety, social self-efficacy, and preference for online social interaction using SEM and examined all the path coefficients. The findings from this study indicate that loneliness alone does not necessarily cause SNS use or addiction; rather, in cases in which online preference for online social interaction is activated by unmet needs for relationships, loneliness seems to cause SNS use and addiction through social anxiety and preference for online social interaction.

Sixth, social anxiety was found to be positively related to SNS addiction tendency. However, social anxiety did not have a direct effect on SNS addiction tendency; rather, social anxiety had an indirect effect on SNS addiction tendency through preference for online social interaction. These findings are not consistent with the findings from previous studies that individuals with higher social anxiety had difficulties with forming and maintaining relationships offline and were more likely to use SNS excessively, because they use SNS as a substitute for social interactions offline (Erwin, Turk, Heimberg, Fresco, & Hantula, 2004; Im, 2014; Lee & Sung, 2013; Morahan-Martin & Schumacher, 2000; U, 2013). The findings from this study indicate that individuals with higher social anxiety may try to avoid online interactions but prefer online to offline social interactions. As such, individuals with higher social anxiety in offline situations are more likely to be drawn to SNS. However, anxiousness and an avoidant tendency related to social situations could also affect these individuals while they are online in the same way as in offline situations (Kraut et al., 2002).

The findings from this study have theoretical and clinical implications.

First, this study can be differentiated from previous studies because it tested a more comprehensive model as an extension of Park’s (2013) model with cognitive (i.e., social self-efficacy and preference for online social interaction) and psychosocial variables (i.e., covert narcissism and social anxiety) as predictors of SNS addiction. Second, the role of covert narcissism, which was reported as one of the powerful predictors of media addiction in the process of becoming addicted to SNS, was confirmed in this study. This finding has implications for psychotherapists seeking more effective ways to treat clients with narcissistic traits who are addicted to SNS. Clients high in covert narcissism experience social anxiety at higher levels because of their strong need for others’ approval of their grandiose selves, their fragile nature, and their severe difficulties with handling any criticism from others (Son, 2010). With the anxious and rejecting characteristics of covert narcissists in mind, psychotherapists should focus on building a trusting relationship with clients. Therapists must also help covert narcissists become aware that their internal tendencies and psychological needs could lead them to SNS addiction and using cognitive-behavioral methods help them to deal with irrational beliefs such as “I have to be perfect” or “I must be loved by everyone.” Gestalt techniques such as “stay with it,” breathing exercises, relaxation training, and body awareness training
could also be applied. Therapeutic approaches customized to each client should be used to make the process of counseling more effective.

Third, it has been reported that individuals with higher SNS addiction tendency are more likely to experience social anxiety and loneliness (Kang, 2013; Lee & Son, 2013; Oh, 2012; U, 2013; Yoon & Park, 2014). However, preference for online social interaction, which is a maladaptive cognitive characteristic, was found to be an important mediator in the relationships between social anxiety and loneliness and SNS addiction tendency in this study. The preference for online social interaction seems to develop in situations in which individuals want to avoid offline interaction due to higher social anxiety and loneliness and want to become actively involved in online space instead. In turn, preference for online interaction seems to have a strong effect on SNS addiction tendency through the interpersonal motives for SNS use. Based on the findings from this study, interventions must address this preference for online social interaction. Interventions focused on a preference for online interaction, which is a cognitive characteristic, are expected to be more effective than interventions focused on self-esteem or emotional characteristics alone. An intervention approach based on a cognitive-behavioral model would be especially useful for modifying clients’ dysfunctional cognitions. The modified cognitions would change the way clients use SNS.

Although this study has contributions to the literature on SNS addiction, it is not without limitations. First, all participants were college students. The students were recruited from limited areas in South Korea. Therefore, the sample is not representative of Korean SNS users in general. In future research, representative samples covering diverse age groups and regions should be used.

Second, SNS addiction among adolescents is a pressing issue. Thus, there is a demand for further research with adolescents. The research model examined in this study needs to be further examined using more male participants, because over eighty percent of the participants in this study were female. The findings might not be applicable to explaining SNS addiction among male participants. Motives for SNS use are different between male and female users. According to one study (Jo, 2014), interpersonal motives are more important among female users, while information-seeking motives are more important among male users. Female users are more involved in SNS activities and are higher in SNS addiction tendency. More research is needed to further understand gender differences in SNS addiction.

Third, further studies are needed to examine how SNS use patterns are associated with differences in SNS addiction tendency. In previous studies, gender, age, frequency of SNS use per week, length of SNS use time per day, and duration of continuous SNS use were found to be related to SNS addiction tendency (Yoon & Park, 2014). Being female (Lee & Jo, 2007), having many friends that keep in touch through SNS (Pi, 2013; Yoon & Park, 2014), and spending a lot of time on SNS (Jung & Kim, 2014; Oh, 2012) were found to be risk factors for SNS addiction tendency. In previous studies, SNS use patterns were significant predictors of SNS addiction tendency, indicating that variables representing patterns of SNS use along with psychological variables must be examined in future research models for a more comprehensive understanding of SNS addiction tendency. Because the
data analyzed for this study were collected from a non-clinical population, the level of participants’ SNS addiction tendency was moderate. Therefore, there was a limitation in testing the final structural model. In future research, the final model needs to be tested again with a sample of individuals in treatment for SNS addiction.

Fourth, the final structural model had correlations that were opposite in sign to the bivariate correlations between covert narcissism and preference for online social interaction, between loneliness and SNS addiction tendency, and between social self-efficacy and preference for online social interaction. The finding could be an indication that there was a suppression effect in the final model (Cohen et al., 2003). Future studies with more representative samples are warranted to clarify the issue of a suppression effect, which may have influenced the results of this study.

Fifth, because this study used a cross-sectional rather than a longitudinal or experimental research design, the causality presented in the estimated model could not be guaranteed. Further research using a longitudinal research design is needed to support causality.

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