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The Relationships Among Social Media Intensity, Smartphone Addiction, and Subjective Wellbeing of Turkish College Students

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Abstract

Excessive use of new technologies appears to be potentially addictive for a minority of young people. The aim of the present study was to examine the relationship between personal environment factors (self-esteem and subjective wellbeing) and behaviors (social network site [SNS] intensity and smartphone addiction) drawing upon the Social Cognitive Theory and utilizing structural equation modeling. The sample comprised 734 undergraduate Business School students. Findings indicated that young people tend to use SNSs to enhance their extrinsic outcome expectation (network size) rather than intrinsic one (subjective well-being). Based on our knowledge, the present study is the first to address SNS usage behavior to assess extrinsic and intrinsic factors separately. Results also show that high SNS intensity is associated with high levels of smartphone usage, which decreases the individuals' level of subjective wellbeing. It is also proved that low self-esteem causes smartphone addiction. Lastly, there is a weak but significant relation between SNS intensity and network size is also found. Overall, the present study contributes to our understanding of problematic smartphone and social media use.

Keywords Social media use · Smartphone addiction · Social media addiction · Problematic smartphone use · Problematic social media use

Introduction

Technological advances represent ongoing emerging opportunities and challenges in various aspects of individuals' daily lives such as the way business is conducted

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(Shankar et al. 2010), sleeping (Punamäki et al. 2007), eating (Rosen et al. 2014), shopping style (Jia et al. 2014), and relationships (Greenwood et al. 2016). One development that has really changed individual's lives is smartphone use and the way they have now become so integrated into people's everyday lives, particularly in regard to social media use (Kuss and Griffiths 2017). A recent US study indicated that the urge to check social media was more addictive than smoking cigarettes and drinking alcohol (Techspirited Staff 2018). To date, researchers there is no agreed consensus concerning the definition of problematic social media use (Wegmann et al. 2015; Bányai et al. 2017) because of the conceptual confusion regarding the classification of problematic internet use. Young (1999) classified internet addiction as comprising five main types: computer addiction, information overload, net compulsions, cyber-sexual addiction and cyber-relationship addiction. However, these have been heavily criticized by (Griffiths 1999) who argued that these types mostly represented addictions on the internet, not to it. Kuss and Griffiths (2011) proposed that social media addiction falls into Young's category of cyber-relationship addiction where the primary purpose is to use social networking sites (SNSs) to follow, communicate, and/or develop (and maintain) relationships with others.

In the present study, in addition to SNS intensity, smartphone addiction is also examined. Whilst, researchers generally agree that excessive use of a smartphone can be problematic and cause undesirable consequences in everyday life (Billieux 2012; Volkmer and Lermer 2019), there is little consensus about what smartphone addiction actually is (Gutiérrez et al. 2016). Furthermore, Kuss and Griffiths (2017) claimed individuals were no more addicted to smartphones than alcoholics were addicted to bottles. Nevertheless, problematic use of a smartphone (and more specifically the applications on it) is accepted by many scholars as a behavioral addiction (e.g.,(Haug et al. 2015; Körmendi et al. 2016; Kwon et al. 2013)) and has similar patterns with addiction such as tolerance, impaired control, conflict, relapse, and withdrawal symptoms (Billieux et al. 2015; Griffiths 2009).

It should also be noted that SNS addiction is arguably a type of 'internet addiction' given that SNS use requires an internet connection. It could also be argued that internet addiction (as an 'umbrella' term) includes both SNS addiction and smartphone addiction. According to Young's (1999) internet addiction typology, SNS addiction and smartphone addiction are arguably located within the same sub-type, namely cyber-relationship addiction (Griffiths et al. 2014), although it is theoretically possible for an individual to be addicted to gaming or gambling via a smartphone (which again highlights that individuals have addictions on their smartphone rather than being addicted to it). Kuss and Griffiths (2017) noted the overlap between social media addiction and smartphone addiction, and Gezgin (2018) specifically called for researchers to investigate the relationship between SNS intensity and smartphone addiction in a developing country context (such as the present study which was carried out in Turkey).

The present study has two main objectives: (i) to propose a new model explaining how self-esteem affects SNS intensity and smartphone addiction and how these behaviors are associated with the subjective wellbeing of college students guided by Social Cognitive Theory, and (ii) to empirically test the proposed model using data collected from young SNS users. The paper is organized accordingly; in the second part theoretical background is presented with its selected constructs. Third part discusses

proposed research model with related hypotheses. Fourth part is dedicated to method. Fifth part is about analysis and following results. Finally, discussion, limitations and further studies are mentioned.

Theoretical Background

The present study's research model is based on Bandura's (1986) Social Cognitive Theory (SCT). This theory helps in understanding the social side of using information technology and its consequences (Lin and Huang 2008, 2010; Zhou et al. 2014). SCT emphasizes the importance of socialization during the learning process and claims that individuals' behaviors, habits, and even their individual values partially shaped and controlled by social channels (Bandura 1986).

The interaction between the individual, the behavior, and the environment (personal and occupation/education) form the basis of SCT. According to SCT, individuals' behavior can be changed (e.g., whether they have a smartphone addiction) by the perceived personal environmental factors (e.g., changing the environment to boost individual self-esteem) and vice-versa (Moqbel and Kock 2018). In the scope of the present study, SNS intensity and smartphone addiction refers to the behavior side of the theory. Following previous research (Chiu et al. 2006; Lin and Chang 2018), self-efficacy has not been taken into account in previous studies even though both smartphone and SNS usage are voluntary activities. What this means is that individuals who are unwilling or have no confidence to perform specific activities would be unlikely to engage in them. The present study focuses on two of three factors, namely behavior and personal environment of the SCT. In the research model (Fig. 1), self-esteem (a cognitive variable), subjective wellbeing (an intrinsic outcome expectation) and network size (an extrinsic outcome expectation) represent the personal environment factors, whereas SNS intensity and smartphone addiction refer to the behavioral traits.

SNS Intensity (SI) and Network Size (NS)

SNSs offer many benefits for their users by means of establishing and maintaining relationships with friends, colleagues, family members, as well as different purposes like knowledge-sharing, learning, information retrieval, etc. (Ainin et al. 2015). SNSs can have positive consequences such as enhanced social capital (Ellison et al. 2007) and sense of belonging (Davis 2012), public individuation, and user innovativeness (Choi and Kim 2016).

In the present study, SNS usage patterns were chosen as the main indicator of SNS addiction. Previous work has indicated that rate of use (SNS intensity), network size, and variety of use are the main usage patterns of SNSs (Choi and Kim 2016). In the present study, SNS intensity refers to time spent and usage frequency on SNSs. The study operationally equates SNS intensity with SNS addiction because SNS intensity represents SNS addiction relatively well. In their detailed literature review, Kuss and Griffiths (2011) have emphasized the necessity of analyzing the people who suffer from excessive SNS usage in order to better understand SNS addiction. Some studies have also used the term 'smartphone addiction' to relate to the heavy investment of time interacting with a smartphone (Roberts et al. 2015; Samaha and Hawi 2016). Network
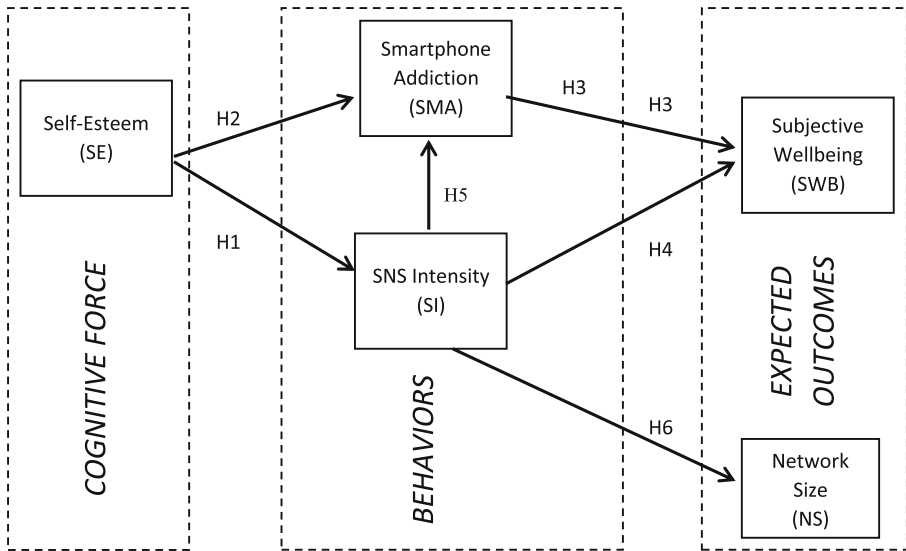
Fig. 1 Research model with related hypotheses

size refers to the number of connected people via SNSs (Salehan and Negahban 2013. Ganley and Lampe (2009) posit that SNS intensity and network size may have an interdependent relationship. Therefore, it is critically important to examine their possible effect on each other. Simply put, network size is expected to correlate positively with the SNS intensity (Salehan and Negahban 2013) and spending more time on SNSs positively correlates with the addictive tendencies (Wu et al. 2013).

Smartphone Addiction (SMA)

Although defining addiction is considered controversial, it is generally characterized as a hard to stop undesirable habit (Akers 1991). In the literature, there are two main types of addiction: behavioral addiction (computer gaming, gambling, excessive use of internet, etc.) and substance addiction (excessive use of a chemical substance such as drugs, alcohol, heroin, etc.) (Alavi et al. 2012). SMA is a type of behavioral addiction, more specifically a technological addiction which involves human-machine interaction (Griffiths 1996), and features the characteristics of other addictions such as saliance, mood, modification, and and resulting various daily life problems (Samaha and Hawi 2016).

Self-Esteem (SE)

Self-worth, self-respect, self-acceptance, and self-esteem are all thought to be interchangeable constructs. Simply put, the construct refers to what individuals think about themselves (Aydın and Sarı 2011). Therefore, especially in adolescence and adulthood years, young people's SE is critically shaped by their peer relationships (Rosenberg 1965). In the age of technology, peer relationships for young people arguably mean more than face-to-face communication because of the variety of social media

opportunities. It is indicated that accessing SNSs any-time and anywhere causes some effects on SE in terms of bridging social capital (Steinfield et al. 2008).

Subjective Wellbeing (SWB)

Happiness, life satisfaction, and subjective wellbeing are constructs that are sometimes used interchangeably but are different. First, life-satisfaction is subsumed within subjective wellbeing together with the positive affect and negative affect dimensions. Happiness has nearly the same meaning as life satisfaction. The main distinction between them is that happiness is more likely to refer to an individual feeling good for themselves while life satisfaction additionally includes other people's feelings (Ng 2015). In the present study, in addition to SE, SWB as an indicator of individual's feeling is also examined because of two main reasons: (i) SWB is a broader concept that involves life-satisfaction, negative affect, and positive affect, and (ii) because SWB is more than what an individual feels about their current status and also captures other people's feelings, using SNSs may have possible effect on SWB, since it creates opportunities to learn what anyone thinks about themselves.

Research Model and Hypotheses

The present study examines the relationship between two personal environmental factors and two potential addictions. Drawing on the SCT, Fig. 1 presents the research model. It is proposed that low self-esteem can lead to addictive behaviors, which are associated with individuals' SWB. There are several reasons why people so attracted towards technology, and especially SNSs. One possible reason concerns socialization preference options. Instead of face-to-face communication, they choose another option because they feel more psychologically comfortable (Ehrenberg et al. 2008). Other antecedents to SNS addiction include narcissism (La Barbera et al. 2009), impulsivity (Wu et al. 2013; Rothen et al. 2018), and extraversion (Ross et al. 2009; Wilson et al. 2010). Clearly, from the lens of SCT, most of the antecedents of SNS addiction are related to personal environment. In this context, Andreassen (2015) claims if an individual feels out of depth making face-to-face social connections and believes that excessive use of SNS replaces the social skills needed, then SNS addiction can occur. Studies investigating the relationship between poor SE and SNS addiction also support this theory. Individuals with low SE find the virtual world a safer place to express themselves freely (Koo and Kwon 2014) which in a minority of individuals can lead to SNS addiction (Malik and Khan 2015; Andreassen et al. 2016; Hawi and Samaha 2017; Bányai et al. 2017; Hawi and Samaha 2018; Kircaburun et al. 2018). Consequently, it is hypothesized:

H1: SNS intensity is negatively predicted by the level of individual self-esteem.

For young individuals, excessive smartphone use has become a major part of their culture. Besides SNS intensity, SMA may also be related to SCT's personal environment. Previous studies have found that anxious (Hong et al. 2012) and lonely individuals (Dayapoğlu et al. 2016) are inclined to develop SMA because they feel shy during their socialization process. Additionally, SMA is also associated with the lack of social

skills (Kring et al. 2007). One recent meta-analysis study (Elhai et al. 2017) analyzed the role of psychopathological factors in SMA and found that depression, anxiety, and low SE were the most important predictors of SMA. Depression and anxiety severity have consistently been associated with addictive behavior. However, the relationship with SE has been inconsistent. For instance, some studies have found no significant relationship between SE and SMA (Walsh et al. 2011; Smetaniuk 2014; Pugh 2017). An early empirical study found poor SE led to higher smartphone usage frequency (Bianchi and Phillips 2005). Young individuals with low SE have also been shown to have a great preference for instant messaging as opposed to individuals with high level of SE (Ehrenberg et al. 2008), and one study found that females that overuse their smartphones suffer from a lack of self-confidence (Billieux et al. 2015). Many researchers continue to advocate that low SE is associated with problematic smartphone use and addictive behaviors (Ha et al. 2008; Leung 2008; Hong et al. 2012).

H2: Smartphone addiction of individuals is negatively determined by the level of individual self-esteem.

It can be plausibly asserted that SMA intensity will lead to some difficulties in emotional regulation (Hormes et al. 2014; Andreassen and Pallesen 2014). In the empowerment-enslavement paradox, McDaniel (2015) states that portable and high-tech smartphones serve many advantages such as around-the-clock connection, yet this limitless availability can mean individuals become 'slaves' to their phones. Smartphone usage among family parents can increase family connection and their social capital (Padilla-Walker et al. 2012; Pearson et al. 2017) and regular voice communication creates stronger bonds (Wei and Lo 2006). On the other hand, smartphones can also lead to individuals ignoring each other (Ling 2004) and increased phone calling is associated with greater loneliness (Jin and Park 2013) and low SWB (Kim et al. 2009). Parallel with these findings, a recent largescale study's findings indicated that smartphone usage for communication initially has a positive effect on SWB. However, this does not appear to be sustained over time (Bae 2019). Another recent study found that smartphone usage has positive effects on the SWB of older individuals (35–54 years and 55–70+ years) but not for the youngest cohort (Chan 2018). A possible explanation of the findings could be that as individuals get older they want to have more intimate relationships and use their phones to communicate and maintain their relationships which facilitate their SWB positively. Since the present study was conducted with those aged 19–25 years, based on Chan (2018)'s findings it is proposed that:

H3: The individual degree of subjective well-being is negatively influenced by smartphone addiction.

Scholars agree that the popularity of SNSs has grown alongside the rise of emerging technologies (Andreassen and Pallesen 2014). However, this popularity has resulted in a small number of individuals who appear to be addicted to SNSs (Kassel 2010), inhibiting daily life activities (Charlton and Danforth 2010), and increasing perceived stress levels (Meena et al. 2015). These negative symptoms are more common among young individuals because they are more engaged with the SNSs (Baker and Moore

2008). Literature concerning the relationship between SI and its possible emotional effects demonstrates mixed results. One recent meta-analysis study made a call for further research examining the relationship between SI and psychological wellbeing indicators especially life satisfaction to better understand the phenomena (Huang 2017). According to Baek et al. (2013), this gap and inconsistent findings may arise from the different purposes of SNS usage. Baek et al. (2013) indicated that social activities such as online chatting decrease feelings of loneliness. However, para-social activities like checking another individual's profile may show opposite effect. Rae and Lonborg (2015) went one step further and explained social activities alone are not enough to create positive feelings via SNSs. The main distinction stems from the user's intention. Wellbeing has been found to increase if time spent on SNSs is used to maintain current relationships, but it could decrease when time is used to initiate new friendships (Wilcox and Stephen 2013; Rae and Lonborg 2015). Similarly, individuals who spend more time and have more friends on SNSs are more inclined to believe that life is unfair and others have better lives than themselves (Chou and Edge 2012).

Consistent with these findings, a recent study also showed that the wellbeing and SNS intimacy relationship is negative for younger users who generally prefer to use SNSs for creating new connections, but positive for older users whose first aim is to sustain their relationships (Munzel et al. 2018). Despite ongoing controversies (Wilcox and Stephen 2013; Rae and Lonborg 2015; Hu et al. 2017; Munzel et al. 2018) and a few studies reporting positive associations between SI and SWB (Valkenburg and Jochen 2007; Valenzuela et al. 2009), the majority of studies have investigated the negative association, especially among young users (Kross et al. 2013; Krasnova et al. 2013; Satici and Uysal 2015; Meier et al. 2016; van Rooij et al. 2017). Given the sample of the present study was young individuals and that they use SNSs for social compensation, it is hypothesized that:

> H4: The individual degree of subjective well-being is negatively influenced by SNS intensity.

Recent studies have demonstrated that the smartphone checking frequency is high. Woollaston (2013) reported that individuals check their smartphones at least 110 times during a typical day. Gezgin (2018) reported that nearly half of high-school students used their smartphones for more than four hours a day. According to Salehan and Negahban (2013), there are four main reasons why SNSs causes SMA rather than traditional smartphone activities like texting, emailing, and surfing on the internet First, the number of online friend networks on SNSs is likely to be greater than number of friends on a smartphone contact list. Second, communication via SNSs targets a general audience whereas traditional smartphone activities (such as texting, emailing) target a specific individual. Third, SNSs are more suitable for group discussions. Fourth, SNSs are not restricted by geographic boundaries. Given that high SNS usage appears to be related to SMA (Roberts et al. 2014; Barnes et al. 2019), it is hypothesized that:

> H5: Mobile phone addiction is positively determined by SNS intensity.

Individuals tend to use SNSs to overcome loneliness, social presence and/or facilitate practical needs such as immediate communication and coordination (Xu et al. 2012).

Network size can facilitate hedonic needs (i.e., as their network grows, they perceive themselves as being more popular) and as such can be viewed as an extrinsic outcome expectation from the SCT perspective. However, some studies indicate that network size positively affects SI (Salehan and Negahban 2013; Yang et al. 2016; Rashid et al. 2019). Here, it is argued that the reverse is also possible which means that individuals use SNSs more frequently to enhance their social network and have more online friends and followers on their profile. Consequently, it is hypothesized that:

H6: Network size is positively determined by SNS intensity.

Methods

In this section, we will present the research procedures, participants, measures that are employed in this study as well as analysis procedures and the discussions of the results.

Procedures and Participants

The participants comprised business faculty students from two different universities in Turkey. The reason why we focus on university students is that almost all of them have smartphones and use SNSs actively. The study utilized convenience sampling. While this sampling method may not guarantee the representativeness of the universe, it seems the most convenient approach to reach all the possible business students at selected universities. Participants engaged in an offline survey because of two reasons. First, it is believed that majority of respondents are not willing to answer 'network size' question since it requires checking the number of friends on one of the favorite social media platforms. Thanks to the face to face questionnaire, it is politely said and emphasized the importance of getting answer for all the questions. Second, we minimize the 'mode effect' which is known as the tendency to select mid-point answers in online surveys (Duffy et al. 2005).

The participants were briefed about the aim of the study beforehand. Participation in the survey was completely voluntary. Data collection is lasted about two months during 2017/2018 academic year. Of 850 surveys were distributed, 739 were returned. After the removal of outliers, data from 734 participants were retained for further analysis. The survey comprised two sections (demographic information about the participants in the first section, and five latent variables being examined in the research model in the second section).

Measures

The survey assessed demographic information (gender, year in college, favorite SNS), SNS intensity, smartphone addiction, self-esteem and subjective wellbeing. Apart from 'network size', all responses were given on a five-point Likert scale from 1 ('strongly disagree') to 5 ('strongly agree'). Network size was assessed using a continuous scale. Used instrument can be shown in Appendix 1.

Rosenberg Self-Esteem Scale (RSES; Rosenberg 1965): The RSES originally comprised ten items with three assessing negative feelings. The remaining seven items

assessing positive feeling (e.g. "On the whole, I am satisfied with myself", "I take a positive attitude toward myself") were used in the present study. In previous research, the RSES has approved its discriminant validity, internal consistency and test-retest reliability (Mehdizadeh 2010).

Smartphone Dependence Questionnaire (SDQ; Salehan and Negahban 2013). The SDQ comprises five items adopted from Salehan and Negahban (2013). The SDQ was combined with two items from Kwon et al.'s (2013) Smartphone Addiction Scale (SAS). The final instrument (SMA) included seven items (e.g., "I use my mobile phone longer than I intend. "I can't do without my mobile phone."). Although Salehan and Negahban (2013) study's title include the term mobile phone, their main purpose is … (2) "to empirically test the proposed model using data collected from smartphone users". They focused on smartphone users as another well-known researchers did (Kwon et al. 2013). First, we used Salehan's survey but the Cronbach Alpha that we got was very low. So, we combined these two scales in order to get a more convincing Cronbach Alpha. Very interestingly, the highest Cronbach Alpha among the other scales belonged to newly created one with the number of 0.860. Also, we got quite good CVI (Content Validity Index) values with this newly created scale. For convergent and construct validity, we looked also Pearson Correlation Coefficients. They were also acceptable.

SNS Intensity Scale (SIS; Salehan and Negahban 2013). The SIS assesses the frequency of SNS usage as well as emotional attitude towards these platforms. The scale comprises five items (e.g. "Visiting social networking sites is part of my everyday activity", "I check my social networking site(s) almost every day"). The last item "I feel I am part of the community of my social networking site at the campus" could not be adequately translated into Turkish and was deleted due to the low item loading.

Network size was simply assessed by asking participants the total number of friends they had on their favorite SNS. The question is: Consider the SNS that you used more frequently and state how many friends you have in that platform. The average network size in the present study was 380 after eliminating some extreme values.

Satisfaction with Life Scale (SWLS; Diener et al. 1985). The SWLS assesses life satisfaction and comprises four items (e.g. "I think I am a happy person").

Ethics

The study was approved by the first author's university ethics committee. The number of the ethical approval is 6,192,333/050.99/. All the ethical committee members reach the consensus on the ethical suitability of the related survey. All participants were informed about the study and the procedures were carried out according to Helsinki Declaration.

Analysis

We used SPSS v.20 to calculate descriptive statistics. For Confirmatory Factor Analysis (CFA) and Latent Theoretical Model testing, we used SmartPLS v.3. This study is utilized Partial Least Squares (PLS) Techniques by using SmartPLS software. PLS path

modeling was developed by Wold (1982). SmartPLS utilizes PLS technique and it is a recent most widely used method in doing Latent Variable Modeling. PLS algorithm is basically a series of regression equations as weight factors. We used series of Ordinary Least Square (OLS) regressions to estimate the relationships among latent variables. PLS relies on factors scores or summed scales rather than covariance matrices for analysis that is the major difference of SmartPLS from other SEM software like LISREL and AMOS. PLS Path Modeling has some important advantages over other statistical techniques, such as regression, Structural Equation Modeling (SEM) and simultaneous equations (Mcintosh et al. 2014). Despite its some short comings, PLS path modeling techniques have some notable advantages over other SEM techniques like reduced computational power demands and superior convergence behavior, robustness to small sample sizes, tolerance of badly-behaved distributions, exploratory capabilities in the absence of theory and others (Mcintosh et al. 2014). We also performed bootstrapping technique to reveal statistical significance levels of theoretically proposed paths in our model. SmartPLS creates typically 5000 sub samples to estimate PL Path Model and assumes the data is non normally distributed.

Results

Majority of the participants are females (61,4%), and the rest is male (38,6%). Students are usually piled in the first third grade of their school. More than 90% is 1st, 2nd or 3rd-grade students. Majority of participants are from the Human Resources Department (31,6%), followed by Heath Management department (25,5%) and Management Department (20.4%). Most of the participants use their cell phones for a prolonged time period, more than 3 years (90%) (Table 1).

By far, the most frequently used social media site is Instagram (79,7%) and followed by Twitter (7,2%). Finally, the network size (number of people or friends in their Network) of the participants ranges from minimum 5 individuals to maximum 2500 individuals with an average of around 381 people and standard deviation of 339 individuals.

Below Table 2, brief information regarding our model's constructs is given:

The mean values of each theoretical construct range from 2468 to 380.634, and standard deviation of each construct ranges from 0.627 to 339,032. Except for network size, all other four constructs are measured by five-point Likert scales. Network size is the total number of contacts in the participants' social network. Outer factor loadings of each theoretical construct are usually above 0.500, up to 0.800 s. Mostly above or very close to 0.70 threshold specified by Hair et al. (2014). Only one item is Subjective Well Being Scale has taken out from analysis (SBW5). Five items from Self Esteem Scale (SE_5, SE_6, SE_7, SE_8 and SE_9), one item from the Smartphone Addiction Scale (AD_5) and one item from the SNS Addiction Scale (NI_5) have been taken out from the analysis due to their low loadings during reliability analysis. Since there is only one item in the Network Size Scale, the factor loading and other measurement parameters of this scale, except mean and standard deviation, have turned out to be 1000. Reliability of the scales or internal consistency are all above 0.70 as threshold specified by (Nunnally 1978). Similarly, another measure of reliability, calculated combining all variances and co-variances in the composite of indicator variables related to construct

Table 1 Demographics of the participants

Characteristics	Total N (%)
Gender	
Female	451 (61,4)
Male	283 (38,6)
Class	
1st	202 (27,5)
2nd	208 (28,3)
3rd	254 (34,6)
3th	70 (9,5)
Department	
Human Resources Management	232 (31,6)
Management Information Systems	119 (16,2)
Health Management	187 (25,5)
International Trade	46 (6,3)
Business Administration	150 (20.4)
Length of using a cell phone (Year)	
<1	6 (0.8)
1~3	67 (9,1)
3~5	216 (29,4)
>5	445 (60.6)
Mostly Used Social Media	
Instagram	584 (79,7)
Twitter	53 (7,2)
Other	47 (6,4)
Facebook	42 (5,7)
Snapchat	5 (0.5)
LinkedIn	3 (0.4)

and divided by sum of the total variance is the Composite Reliability (CR). Similar to Alpha, Composite Reliability sufficient score was defined 0.70 and above for reliable scales by McDonald's (1978). As it can be seen from Table above, all CR scores are again 0.80 and above, except Subjective Well Being Score that is a little lower than 0.700 threshold (0.667). Finally, Average Variance Extracted (AVE) scores are a measure of the amount of variance captured by a construct in relation to the amount of variance due to measurement error. It helps us to assess the discriminant validity of our scales. The threshold for AVE scores is identified by Fornell and Larcker (1981) as 0.50. As it can be seen in Table 2, our scales, except two scales have 0.50 and above AVE scores. Self Esteem scale has quite close value to 0.500 (0.476), while Subjective Well Being Scale has resulted in lower value (0.368). Content Validity Index (CVI) has been calculated based on Aiken V statistics. I = Aiken (1980) proposed this statistic to summarize item content relevance ratings received from experts or sample respondents. The accepted threshold is above 0.50 of each item in the construct. As we can observe from Table 2 above, all except one (ADD_3) item CVI values are either greater or very

Table 2 Descriptive statistics of the variables

Construct Items	Mean[a]	Standard Deviation	Factor Loadings (>0.7)[b]	Cronbach Alpha (>0.7)[b]	Composite Reliability (>0.7)[b]	Average Variance Extracted (>0.5)[b]	C V I (>0.5)[c]
Smartphone Addiction	2468	0.777		0.860	0.896	0.592	
AD_1			0.805				0.54
AD_2			0.808				0.44
AD_3			0.776				0.35
AD_4			0.758				0.46
AD_6			0.645				0.55
AD_7			0.810				0.45
SNS Intensity	3007	0.833		0.732	0.830	0.555	N/A
NI_1			0.560				
NI_2			0.750				
NI_3			0.825				
NI_4			0.815				
Self-Esteem	3920	0.627		0.748	0.818	0.476	N/A
SE_1			0.589				
SE_2			0.645				
SE_3			0.765				
SE_4			0.642				
SE_10			0.789				
Subjective Well Being	3200	0.752		0.715	0.667	0.368	N/A
SWB_1			0.736				
SWB_2			0.293				
SWB_3			0.831				
SWB_4			0.393				
Network Size	380.634	339,032		1000	1000	1000	N/A
Network Size			1000				

[a] Mean value has been calculated by the simple arithmetic mean of the responses in the scale

[b] Widely accepted threshold values have been provided for each psychometric measure

[c] The CVI value has been calculated for only newly created scale

close to 0.50. Hence, we can generally argue that newly incorporated and developed Smartphone Addiction Scale. For Convergent and Construct Validity of Smartphone Addiction Scale, we looked at the Pearson Correlation Coefficients. All correlations among the newly created Smartphone Addiction index is above 0.30 threshold proposed by Robinson (2018).

Heterotrait-Monotrait (HTMT) method is the most widely used method to assess discriminant validity proposed by Fornell and Larcker (1981). In order to assess discriminant validity, the diagonal elements of the HTMT matrix (Square roots of

AVE values) must be higher than each column and row elements located off-diagonals (correlation coefficients) elements of HTMT Matrix. As we can observe from Table 3 above, all correlations coefficients, located off-diagonal matrix, are smaller than the diagonal elements square root of AVE values as identified with bold fonts. Besides, usually, correlations among theoretical constructs are rather low, indicating they present unique scales.

Finally, the model test results are presented in Fig. 2 below;

The path coefficients, representing theoretical relations and our hypothesis in general are quite high and in the expected direction. For example, we expect there is a negative and significant relationship between SMA and SWB of participants. Hence, we observe a negative and significant path coefficient (-0.251). In the inner model, we have a quite strong R^2 value of smartphone addiction dependent variable (0.425), yet we have not very strong explanatory power of another dependent construct, SNS Intensity (0.000). In the outer model, our primary dependent variable subjective wellbeing also has quite a low explanatory power of 0.039. However, we found a powerful and significant relationship to our second outer model dependent variable and conclude that SI positively and significantly determine NS of our participants. Yet, R^2 of this relationship is not very high ($R^2 = 0.011$). We also are not able to prove the relationships between SI and SWB ($p = 0.127$); moreover, we have failed to find any significant relationship between SE and SI as shown in the Table 4 below. Overall, four theoretical relationships have been approved with high significance levels and we are able to find significant and very powerful relationships for this hypothesis ($p < 0.001$). For two hypotheses, we could not find empirical support, yet one was close to marginal support ($p = 0.127$) and the other was quite far away from the empirical support threshold ($p > 0.10$).

Overall, we have found a sound support for our theoretical model as a result of PLS analysis. Two hypotheses have been rejected, yet one of these rejects can be considered a marginal reject. The other hypothesis revealed a strong acceptance along with presumed and expected signs of relationships.

Discussion

The main objective of the present study is to explain how SE affects SI and SMA and how these behaviors are associated with the SWB of college students guided by Social

Table 3 Convergent and Discriminant Validity Analysis

Construct	Network Size	SNS Intensity	Self-Esteem	Smart-Phone Addiction	SWB
Network Size	1.000*				
SNS Intensity	0.106	0.744*			
Self Esteem	0.029	−0.036	0.689*		
Sm.Ph.Addiction	0.123	0.643	−0.116	0.769*	
Subj.Well Being	0.009	−0.046	0.478	−0.159	0.606*

*The values on the diagonal represent the square root of AVE (AVE = $\sum\lambda2$ / $\sum\lambda2 + \sum\varepsilon$; λ = factor loading; ε = 1- $\lambda2$), the others represent the correlation coefficients
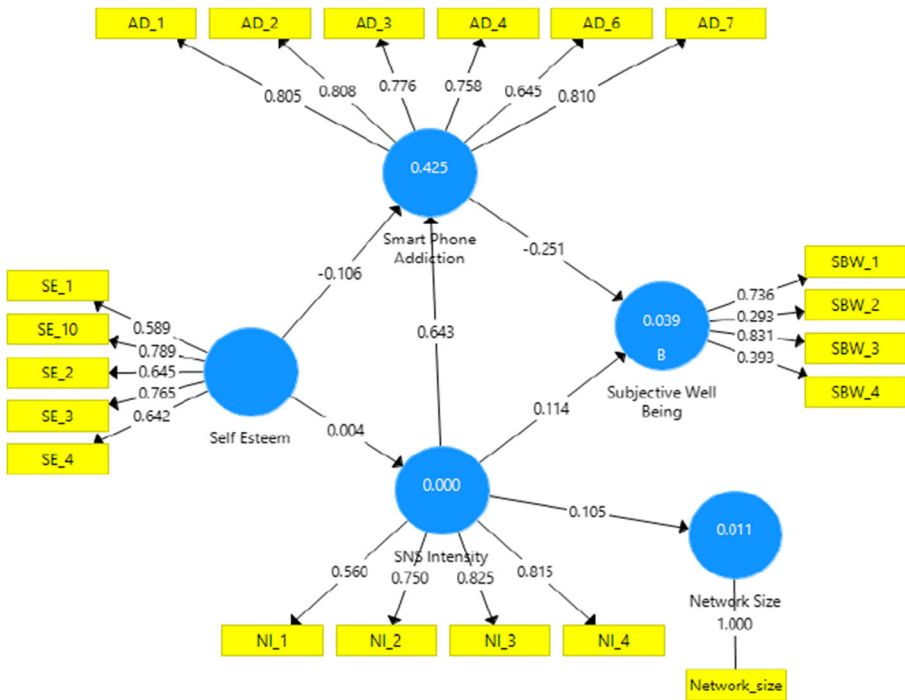
Fig. 2 Final model of the coefficients

Cognitive Theory. We have also tested if SI determines the NS which is considered as an extrinsic expected outcome from SCT's perspective. Analysis has confirmed four of our research hypotheses (H2, H3, H5, H6) and rejected two of them (H1 and H4).

As predicted, there is a negative relationship between SE and SMA (H2). This finding is consistent with the results from previous researches (Leung 2008; Lee et al. 2018; You et al. 2019). For example, Bianchi and Phillips (2005) have argued people with low SE are more likely to send text messages and make calls. Hong et al. (2012) have also asserted that neglecting interpersonal relationships may have a negative

Table 4 Accepted/rejected decisions for research hypotheses

Hypothesis	Path	Path Coefficient	t Value	R2 Values	Results
H1	Self Esteem → SNS Intensity	−0.004[ns]	0.071	0.000	Not Supported
H2	Self Esteem → Smartphone Addiction	−0.106*	0.972	0.425	Supported
H3	Smartphone Addiction → Subj. Well Being	−0.251*	4.491	0.0398	Supported
H4	SNS Intensity → Subj. Well Being	0.114 [ns]	1.530	0.0398	Not Supported
H5	SNS Intensity → Smartphone Addiction	0.643*	28.630	0.425	Supported
H6	SNS Intensity → Network Size	0.105*	2.528	0.011	Supported

* $p <= 0.01$

** $p <= 0.1$

[ns] Non-Significant

impact on SE which leads to being alone and causes which problematic smartphone use. Further studies may focus on the mediating effects of social anxiety (Billieux 2012), interpersonal sensitivity (You et al. 2019), and attachment instability (Kim and Koh 2018) between SE and SMA.

Our research has confirmed H3, which admits a negative relationship between SMA and SWB. Literature generally agree upon that people use smartphones for different purposes which cause different results. For example older people tend to use smartphone making voice calls and maintain their current relationships resulting increased SWB; whereas young people are more likely to use it as a leisure activity which drag them into lower SWB (Kang and Jung 2014; Chan 2015; Rotondi et al. 2017; Volkmer and Lermer 2019). In a recent study, Chan (2018) has found that none of the smartphone usage purpose (voice, email, SMS, Facebook, WhatsApp) predicts high SWB both for younger and older cohorts except for having a WhatsApp group. This exception can be explained the unique form of WhatsApp that offers its users construct their own personalized communities. Although we have not asked our participants for what purposes they generally use their smartphones, it can be propounded that high usage of smartphone adversely affects their life satisfaction, since people tend to get more qualified devices and use them frequently to feel themselves more precious and get social acceptability (Pavis et al. 2001). Another recent study (Horwood and Anglim 2019) deals with the relationship between SMA and SWB based on theoretically grounded measures instead of using short survey form. It is found that SMA is negatively related with lower well-being not only subjective but also psychological well-being.

We have proved H5 which indicated high usage of SNS is positively related with SMA. This association and its possible reasons are well explained by Salehan and Negahban (2013). According to them, there are two main reasons why using SNSs causes SMA rather than traditional smartphone activities. First, as people form larger network circles, the number of people they communicate with also increases, which leads to higher SNS intensity. Second, larger network size causes a high level of information disclosure which means that people who have more friends are more likely to be more active on SNSs. Similar with this line, Körmendi et al. (2016) have observed an 18-year-old girl's behaviors in a smartphone using context and found that most of the activities with a smartphone are connected to SNS and she is afraid of being abandoned by her peers unless she appears online for a while.

From a social capital theory perspective, online social interaction ties have been found to positively influence SNS addiction (Yang et al. 2016). One plausible reason is that users with more friends on their list have frequent communication and spend a lot of time with their networks. A more recent study has also found a positive relationship between Facebook intensity and number of friends on it (Rashid et al. 2019). Parallel with these findings, we confirm H6 that indicated SI positively affects NS. Unlike, we failed to prove the relationship between SI and SWB (H4). The reason why SI positively affects with NS but has no association with SWB is may causes from the outcome preferences. Thanks to this finding, we plausibly assert that people generally want to feel satisfied with their extrinsic outcomes (for this study NS is the outcome expectation) rather than intrinsic ones (for this study SWB is the intrinsic outcome expectation) by means of using SNS. Indeed, people add friends into their friends list may to improve their positive self-presentation (Lee-Won et al. 2014), social

compensation and social involvement (Tufekci 2010) by the means of increasing their potential audiences. Previously, Wu et al. (2013) have also admitted that outcome expectancies can be used for explaining SNS usage behavior, although the authors have not separated into extrinsic and intrinsic outcomes. Based on our knowledge, the present study is the first to address this issue to assess extrinsic and intrinsic factors separately.

Since our H1 and H4 hypothesis were both rejected, it can be asserted that SI is not a good indicator to explain the SCT's personal environment factors. Regarding to H4 hypothesis, similar explanations have also been made by previous researches (Phu and Gow 2019). One possible reason of existence of this insignificant relationship between SI and SWB could be in general the engagement of people into SNS would not be evaluated by only asking their frequency of usage. There may be other possible online activities to support this evaluation as well, which affect their level of satisfaction with life. Another reason could be the presence of the passive/active SNS usage. Wang et al. (2018) believe that passive usage of SNS can decrease SWB, whereas if the user is actively engaged in SNS, this might affect SWB positively. In the present study, we have not compared the engagement degree of our participants into SNS (whether they are active or passive users), since we do not have any observe relationships between SI and SWB. In line with our findings, Kross et al. (2013) have also found any reasonable evidence to explain the inconsistent relationship between SI and SWB. The authors have indicated that whether using SNS predicts changes in SWB depends on how you use it (for what purposes and which type of SNS etc.) and who you do interact with. Taken together, there seems a "Paradox" (Hu et al. 2017) in explaining the relationship between SI and SWB and we surely need a more detailed instrument to assess whether SNS usage has a positive or negative significant impact on SWB. Unexpectedly, it has found no significant relationship between SE and SI. This result is inconsistent with previous researches (Andreassen et al. 2016; Hawi and Samaha 2017) which indicate negative relationship between these two variables. One plausible reason for these contradictory findings is that people especially younger feel obliged to use SNS since most of their peers have at least one profile. It can be asserted that SNSs can no longer be used for escape from the real world even it may become a necessity to catch what's going on and to increase positive feelings even if it not so (Sagioglou and Greitemeyer 2014). Second, unlike smartphones, these platforms offer same opportunities for everyone regardless of their status, so it is easy to access popular SNSs if they want to. In this vein, SE is not a good variable to explain SI behavior of the young people by its own. Other moderating or mediating variables shall be used to clarify whether SE is really has effect on SNS usage behavior or not.

Current study contributes to understanding of the personal environment factors (self-esteem and subjective well-being) and behaviors (social network site [SNS] intensity and smartphone addiction) drawing upon the Social Cognitive Theory. A major contribution to the literature is using SCT perspective in order to explain technology-related behaviors. There may also some practical implications for the present findings. As it is found outcome expectations have higher priority for the high social media use, developers should focus on this issue for the adaptation of their newly launched applications.

Limitations and Further Research

Although, our study's findings are important for psychology and communication scholars; there are some limitations to the present study which offer different ideas for future research. First, our participants were asked to their frequent use of SNS and other variables by the means of self-reported instrument. Instead of using subjective perceptions, social media usage behaviors can be observed by psychometric informatics research methodology which (Montag et al. 2015; Hussain et al. 2019) provides actual SNS usage data. Second, the present study is based on data gathered during 2018 and from Turkish students. Further, longitudinal study designs can be used in different countries with different demographic variables (such as socioeconomic status, age, marital status etc.) to uncover the SNS usage patterns and its effects, to increase external validity. Third, our sample is relatively small and all of them are business department students; therefore, the generalizability of our results is cautioned. Fourth, within the scope of the present study we have only asked general questions to our participants about their smartphone and SNS usage. However, it would be interesting to explore whether our construct (e.g. self-esteem) is related to different purpose of SNS usage which is found no relationship in the present study.

Compliance with Ethical Standards

Appendix 1. Survey Instrument

RSES1. On the whole, I am satisfied with myself.
    RSES2. At times, I think I am no good at all.
    RSES3. I feel that I have a number of good qualities.
    RSES4. I am able to do things as well as most other people.
    RSES5. I do not have much to be proud of.
    RSES6. I certainly feel useless at times.
    RSES7. I feel that I am a person of worth, at least on an equal plane with others.
    RSES8. I wish I had more respect for myself.
    RSES9. I am inclined to feel that I am a failure.
    RSES10. I take a positive attitude towards myself.
    SIS1. Visiting social networking sites is part of my everyday activity.
    SIS2. I check my social networking site(s) almost every day.
    SIS3. I feel out of touch when I haven't logged onto my social networking site(s) for a day.
    SIS4. I feel I am part of the community of my social networking site at the campus.

SIS5. I would be sorry if my social networking site shuts down.

SWLS1.In most ways my life is close to my ideal.

SWLS2. The conditions of my life are excellent.

SWLS3. I am satisfied with my life.

SWLS4. So far, I have gotten important things I want in life.

SWLS5. If I could live my time at over, I would change almost nothing.

SMA1. I feel lost when I do not have my mobile phone with me.

SMA2. When I do not have my mobile phone, I feel disconnected.

SMA3. I feel uneasy in places where mobile phone usage is prohibited.

SMA4. I feel the need to check again immediately after using the mobile phone.

SMA5. My excessive use of the mobile phone causes me to have problems with those around me.

SMA6. I use my mobile phone longer than I intend.

SMA7. I can't do without my mobile phone.

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