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Differentiation of self, emotion management skills, and nomophobia among smartphone users: The mediating and moderating roles of intolerance of uncertainty

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ABSTRACT

The use of smartphones has become increasingly widespread, especially among university students. There is a growing body of research interest related to problematic and excessive use of smartphones. Problematic smartphone usage can cause negative emotions such as intense anxiety and distress when the smartphone cannot be used (e.g., nomophobia), and can lead to negative consequences on mental health. In the present study, two different mediating and moderating effects in which nomophobia was the outcome variable were examined. Firstly, the mediating effect of intolerance of uncertainty was tested in the relationship between differentiation of self and nomophobia. Secondly, the mediating effect of intolerance of uncertainty was tested in the relationship between emotion management skills and nomophobia. Third, the moderating effect of intolerance of uncertainty was tested in the relationship between differentiation of self and nomophobia. Finally, the moderating effect of intolerance of uncertainty was tested in the relationship between emotion management skills and nomophobia. The present study comprised 398 university students (250 females and 148 males). The measures used included the Differentiation of Self Inventory-Revised, Emotions Management Skills Scale, Nomophobia Questionnaire, and Intolerance of Uncertainty Scale. Findings demonstrated that the mediating of intolerance of uncertainty were statistically significant in the relationships examined, but the moderating effects of intolerance of uncertainty were not. Research results are discussed in the light of the related literature and suggestions are presented for future researchers.

Introduction

With the rapid development of smartphone technology, many individuals have started to rely on their smartphones due to the fact that they are a versatile and useful tool that allows many individuals to perform immediate satisfying activities, have instant access to all kinds of information, and communicate via a number of different media. The use of smartphones has become increasingly widespread, especially among university students (Mannion, 2018; Savci et al., 2020; Yildirim, 2014). University students aged 18-24 years are in young adulthood. Empirical research has shown this period to be a risk factor for problematic smartphone use

(Adnan & Gezgin, 2016; Bragazzi & Del Puente, 2014; Yildirim & Correia, 2015). Students at this age range also have more emotional confidence in smartphones for both academic use and social activities (Gikas & Grant, 2013). However, it has been suggested that the frequent use of smartphones may cause negative impacts on psychological wellbeing in a small number of individuals by increasing anxiety in situations where individuals are unable to use their smartphone (such as when they run out of battery, forget to take their smartphone with them after leaving home, are in areas where there is no Wi-Fi access, or when internet connections are suddenly lost) (Lin et al., 2018; Przybylski et al., 2013; Savci, 2019; Savci & Griffiths, 2019; Walsh et al., 2011).

The feeling of extreme anxiety and disturbance among individuals in the absence of the smartphone has been termed "nomophobia" (King et al., 2010; Yildirim & Correia, 2015). The word nomophobia derives from the shortening of the word "no mobile phone phobia" (Yildirim, 2014) and is defined as the phobia of the modern era regarding the loss of access, connection and communication skills resulting from the advent of new technologies (King et al., 2010; Yildirim & Correia, 2015). In the literature, while some researchers suggest that nomophobia should be treated as a specific phobia (King et al., 2014; Lin et al., 2014; Yildirim & Correia, 2015), based on the components model of addiction (Griffiths, 2005), other researchers argue that this concept is associated with smartphone addiction (e.g., Sahin et al., 2013). However, although nomophobia has not yet been formally included in any official diagnostic texts such as the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association [APA], 2013), based on the evidence to date, it appears more appropriate that it is classified as a phobia (King et al., 2014; Lin et al., 2014). Because nomophobia is regarded as anxiety or fear resulting from the inability to use a smartphone it is considered as a specific phobia (Bragazzi & Del Puente, 2014; Yildirim, 2014; Yildirim & Correia, 2015). In the present study, two different mediation analyses and two different

moderation analyses in which nomophobia was the outcome variable were examined. First, the mediating effect of intolerance of uncertainty was tested in the relationship between differentiation of self and nomophobia. Second, the mediating effect of intolerance of uncertainty was tested in the relationship between emotion management skills and nomophobia. Third, the moderating effect of intolerance of uncertainty was tested in the relationship between differentiation of self and nomophobia. Finally, the moderating effect of intolerance of uncertainty was tested in the relationship between emotion management skills and nomophobia.

Nomophobia is considered as a relatively new phenomenon. Therefore, studies are needed to better understand nomophobia. The present study examined the variables that appear to be theoretically related to nomophobia rather than the variables that have already been investigated previously. Consequently, the relationships between nomophobia, differentiation of self, emotion management skills, and intolerance of uncertainty have not been well researched to provide a more detailed explanation of factors underlying nomophobia.

Differentiation of self and nomophobia

As a concept with intrapsychic and interpersonal dimensions, differentiation of self in Bowen's (1978) family system therapy is defined as the ability to maintain self-awareness and autonomy while maintaining links within family and other relationship systems. Differentiation in the intrapsychic dimension involves the ability to regulate emotions and to distinguish thoughts from feelings. Differentiation in the interpersonal dimension involves the capacity to develop an autonomous sense of self, while maintaining close relationships with other important individuals, especially family (Bowen, 1978; Kerr & Bowen, 1988).

Individuals with low levels of self-differentiation, by relying upon their smartphones may tend to encourage intrapsychic and interpersonal fusion (Smith, 2017). The use of smartphones influences and demonstrates how individuals choose to deal with anxiety, manage relationships, and seek approval. Smith (2017) suggested that there was a strong relationship between the intense use of the mobile phone and the fusion which is characterized by seeking approval from other people from the subscales of self-differentiation.

When smartphone users see their devices as something they cannot live without (as in nomophobia), it has been suggested that this can affect their concept of self-identity (Smith, 2017; Walsh et al., 2009) and that smartphone use and engagement may be related to the expression of the self (Mannetti et al., 2002). Walsh et al. (2010) state that young adults who experience high engagement with their smartphones claim that use of their smartphones contributes to improve their self-esteem and report that they feel better by getting approval from favorable evaluation or praise from other individuals. However, highly differentiated individuals are less likely to exhibit nomophobic features, as they have more flexibility and emotion management to deal with stress and anxiety and manage their relationships well. Therefore, it is possible that individuals with lower levels of differentiation who do not have effective coping and emotion management skills can turn to mobile phones as a solution and have nomophobia (Smith, 2017). Considering the relationships between differentiation of self and nomophobia, the following hypothesis was proposed.

- *Hypothesis 1: Differentiation of self predicts nomophobia negatively and significantly.*

Differentiation of self, intolerance of uncertainty and nomophobia

Intolerance of uncertainty is defined as the dispositional incapacity to endure the aversive response triggered by the perceived absence of salient, key, or sufficient information,

and sustained by the associated perception of uncertainty (Carleton, 2016, p. 31) and is associated with a number of psychopathologies including anxiety and generalized anxiety disorder (Dugas et al., 1997; Zlomke & Jeter, 2014), major depressive disorder (McEvoy et al., 2012; Yook et al., 2016), obsessive compulsive disorder (Lind & Boschen, 2009), and social anxiety (Boelen & Reijntjes, 2009). A high level of differentiation indicates that the individual has the ability to take the 'I position' and makes an intellectual decision. This is done even in the presence of intense distressing emotions and conditions such as ambiguous and unstable conditions rather than being emotionally responsive to others (Bowen, 1978; Kerr & Bowen, 1988).

When the relevant literature is examined, there is no research that directly addresses the relationship between self-differentiation and intolerance of uncertainty was found. However, considering that high self-differentiation allows for intellectual decision-making with the ability to regulate emotions even in uncertain conditions (Kerr et al., 1988), it can be said that self-differentiation predicts intolerance of uncertainty. According to Rubino et al.'s (2012) demand-control-person model, in the context of smartphone use, uncertainty can create stress and control helps reduce stress. As a result, nomophobia causes stress and nomophobia can be increased by the presence of uncertainty and lack of control. However, the tendency of individuals with anxiety disorders to perceive their smartphones as a safe zone and to regard uncertain situations as stressful and threatening because of having low tolerance of uncertainty, results in increased levels of distress and anxiety in the event of the lack of control over smartphones (King et al., 2014; Tams et al., 2018). Considering the relationships between differentiation of self, intolerance of uncertainty and nomophobia, the following hypothesis was proposed.

- *Hypothesis 2: Intolerance of uncertainty has a mediating role in the relationship between differentiation of self and nomophobia.*

- *Hypothesis 3: Intolerance of uncertainty has a moderating role in the relationship between differentiation of self and nomophobia*

Emotion management skills and nomophobia

According to Hodgson and Wertheim (2007), emotion management is the recognition, incorporation, understanding, and regulation of an individual's emotions. Managing negative emotions that can hinder relationships leads to more concrete and positive close relationships (Kopelman et al., 2009). In contrast, failing to effectively manage emotions in the face of negative life events leads to behavioral, relational, and physical problems that later become a greater risk (McCraty et al. 1999). In this sense, how individuals regulate their emotions with their emotion management skills is an important part of interpersonal and intrapsychic processes (Kozan et al., 2015).

King et al. (2014) note that individuals with anxiety disorders use their smartphones as a source of assurance as a result of low emotion regulation in stressful and anxious situations. In addition, smartphones can be seen as a means of escape from the problems of the real world for individuals who have emotional difficulties (Demirci et al., 2015; Ghasempour et al., 2015; Kim et al., 2015). Indeed, Davoudi et al. (2019) reported that emotion management and regulation skills predict nomophobic features. Therefore, in the light of the research findings above, it can be said that emotion management processes predict nomophobia. Considering the relationships between emotion management skills and nomophobia, the following hypothesis was proposed.

- *Hypothesis 4: Emotion management skills predict nomophobia negatively and significantly.*

Emotion management skills, intolerance of uncertainty and nomophobia

The difficulty in regulating and managing emotions and intolerance of uncertainty are among the main risk factors for the development and maintenance of emotional disorders in the general population (Carleton, 2016; Gross & John, 2003; McEvoy & Mahoney, 2012). The lack of the ability to use emotion regulation strategies leads to difficulty in managing emotions (Gratz & Roemer, 2004). Difficulty in managing emotion is thought to be associated with a range of psychopathologies, especially anxiety and mood disorders (Aldao et al., 2016; Dragan, 2015; Gross & John, 2003; Mao et al., 2012).

Cai et al. (2018) argue that high levels of intolerance of uncertainty and more use of maladaptive emotion regulation strategy (suppression) are associated with high levels of anxiety and depression. Individuals who experience high levels of anxiety and depression who have difficulty in managing and regulating emotions and have high level of intolerance of uncertainty are exposed to recurrent threatening and negative emotions (Mennin et al., 2015; Roemer & Orsillo, 2005; Watson & Greenberg, 2017). Therefore, they may stay connected to their smartphones to avoid or to alleviate their negative feelings (Demirci et al., 2015; Kim et al., 2015) and may seek supportive social relationships via their smartphones (Ghasempour & Mahmoodi-Aghdam, 2015; Savci &Aysan, 2017). Considering the relationships among emotion management skills, intolerance of uncertainty and nomophobia, the following hypothesis is proposed.

- *Hypothesis 5: Intolerance of uncertainty has a mediating role in the relationship between emotion management skills and nomophobia.*
- *Hypothesis 6: Intolerance of uncertainty has a moderating role in the relationship between emotion management skills and nomophobia.*

The aim and importance of the present study

Considering the fact that nomophobia appears to be a rapidly spreading phenomenon (Adnan & Gezgin, 2016) and can cause negative psychosocial effects in the lives of individuals (Rosen et al., 2016), nomophobia-related mapping is arguably an important issue for public health. Nomophobia is one such effect experienced (Bragazzi et al., 2014; King et al., 2014) and therefore has become the subject of study in a number of countries (Dasgupta et al., 2017; Gezgin et al., 2018; Nawaz et al., 2017; Tavolacci et al., 2015). With the increased interest in nomophobia, these studies usually refer to smartphone usage frequency and potential negative consequences on an individual level, but when dealing with nomophobia in the context of family relationships, there have only been a few studies to date (Arpaci et al. 2017; Buyukcolpan, 2019).

Self-differentiation (which is a concept in Bowen Family Therapy) and emotional management skills examined on the basis of attachment theory are predictors that are closely related to establishing positive relationships with others, and coping with negative emotions such as stress and anxiety. Therefore, they are important to examining their effect on nomophobia which is a concept including anxiety of not being able to use the smartphone and is related to tendency of seeking to approval from others. In addition, intolerance of uncertainty is an important mediator variable the relationship between self-differentiation and nomophobia and between emotion management skills and nomophobia. Consequently, as stated in the related literature, it can be said that all three variables are important in predicting nomophobia.

Research is therefore warranted on the drivers and predictors of nomophobia. As far as the present authors are aware, no study has ever examined the relationship between intolerance of uncertainty, self-differentiation, emotion management skills, and nomophobia within a common model. Therefore, the present study examined the mediating and moderating roles of intolerance of uncertainty on two hypothesized predictors of nomophobia

(i.e., self-differentiation and emotional management skills). The diagram of hypotheses is presented in Figure 1, 2 and 3.
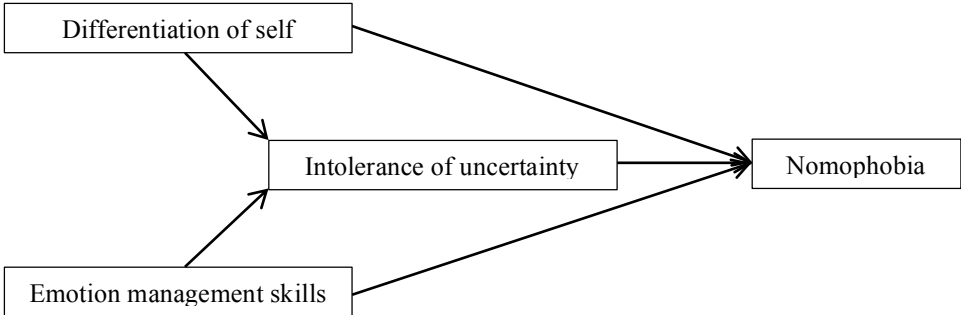

Figure 1. Regression model for the mediating effect of intolerance of uncertainty
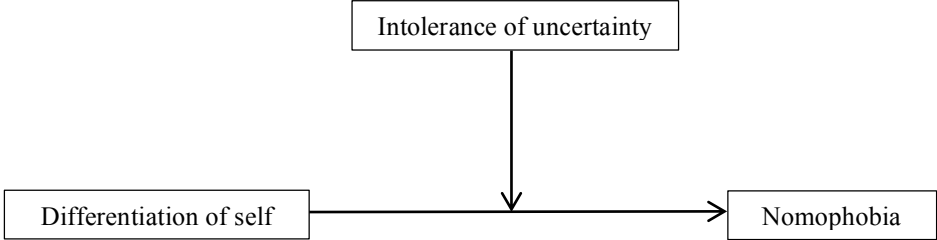

Figure 2. Regression model for the moderating effect of intolerance of uncertainty
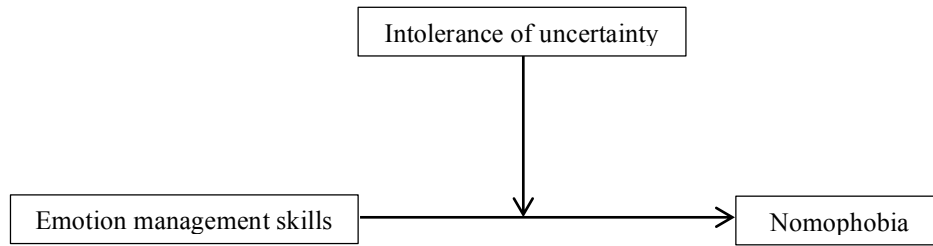
Figure 3. Regression model for the moderating effect of intolerance of uncertainty

Methods

Participants

The present study comprised 398 university students (250 females [62.8%] and 148 males [37.2%]) who had been using smartphone for at least one year. Participants were aged between 17 and 30 years (mean=20.06 years, SD= 2.49). The average daily time spent using smartphones varied between .16 and 10 hours (mean=1.08 hours, SD=.48). All of the data were collected from university students in Turkey.

Materials

Differentiation of Self Inventory-Revised (DSI-R): Practitioners and researchers who have adopted Bowen's Family Systems Approach have developed a number of measurement tools to assess the level of differentiation of the self. Among these measuring tools is the Self-Differentiation Scale developed by Skowron and Friedlander (1998) [Differentiation of Self Inventory (DSI)], which was later revised by Skowron and Schmitt (2003) [Differentiation of Self Inventory (DSI-R)]. The DSI-R is frequently used and was adapted into Turkish by Isik and Bulduk (2013). The DSI-R is a four-dimensional scale comprising 20 items (e.g., *"I am able to say "no" to others even when I feel pressured by them"* and *"I feel it's important to hear my parents' opinions before making decisions"*) and rated on a six-point scale ranging from 1 (*strongly disagree*) to 6 (*absolutely agree*). As a result of the Exploratory Factor Analysis (EFA) performed for the Turkish version of the scale, the DSI-R was found to

comprise four sub-dimensions (emotional reactivity, 'I position', emotional cutoff, fusion with others). High scores on the DSI-R indicate a high level differentiation of self (Isik & Bulduk, 2013). In the present study, the Cronbach's alpha internal consistency reliability coefficient of the DSI-R was good (.74).

The Emotions Management Skills Scale (EMSS): The EMSS was developed by Cecen (2006) and comprises 28 items (e.g*., "I believe I should be loved by everyone"* and *"I have difficulty expressing my emotions in a simple and understandable way"*) and six dimensions (expression of emotions as a verbal, recognizing and accepting of the emotions, expression of the emotions spontaneously, management of negative body response, coping, and management of anger). Responses to the EMSS are answered on a five-point Likert scale ranging from 1 (*not suitable for me at all*) to 5 (*completely suitable for me*). High scores on the EMSS indicate a high level of emotions management skills (Cecen, 2006). In the present study, the Cronbach's alpha internal consistency reliability coefficient of the EMSS was very good (.81).

Intolerance of Uncertainty Scale (IUS): The IUS was developed by Freeston et al. (1994) to assess cognitive, emotional, and behavioral responses to uncertainty conditions and comprises 27 items (e.g., *"Uncertainty makes me vulnerable, unhappy, or sad"* and *"Unforeseen events upset me greatly"*) adapted to English by Buhr and Dugas (2002). Responses to the IUS are assessed using a five-point Likert scale ranging from 1 (*never describes me*) to 5 (*defines me completely*). The adaptation of IUS to Turkish was developed by Sari and Dag (2009). High scores from the IUS indicate a high level of intolerance of uncertainty (Sari & Dag, 2009). In the present study, the Cronbach's alpha internal consistency reliability coefficient of the IUS was excellent (.92).

The Nomophobia Questionnaire (NMP-Q): The NMP-Q was developed by Yildirim and Correia (2015) and adapted to Turkish by Yildirim et al. (2015). The NMP-Q comprises 20 items (e.g., *"If I could not check my smartphone for a while, I would feel a desire to check it"* and *"If I could not use my smartphone, I would be afraid of getting stranded somewhere"*). Responses to the NMP-Q items are rated on a seven-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). As the score on the scale increases, the level of nomophobia increases. In the present study, the Cronbach's alpha internal consistency reliability coefficient of the NMP-Q was excellent (.94).

Procedure and ethics

In the present study, application permission was obtained for data collection and ethics approval was granted by the first author's university ethics committee. Furthermore, each phase of the study was carried out in accordance with the Declaration of Helsinki. The aim of the study was explained to the participants, and written informed consent was provided by all students. All of the data were collected by the researchers in the classes where the students were educated. The inclusion criterion for participants in the study was that that had to have used smartphones for the past year. The data collection process lasted approximately 30 minutes.

Data analysis

In the present study, two different mediation analyses and two different moderation analyses were examined. More specifically, the mediating and moderating effect of intolerance of uncertainty was tested in the relationship between (i) differentiation of self and nomophobia, and (ii) emotion management skills and nomophobia. Prior to the analysis, preconditions for mediating and moderating analyses were examined. Accordingly, the data

should provide single and multiple normality. In addition, there should be no multicollinearity problems in the dataset. Multicollinearity problems occur when the binary correlations between the variables are greater than .90 (Cokluk et al., 2012). Assumptions about these conditions must be met. Firstly, by considering the skewness and kurtosis coefficients, the dataset was examined for univariate normality. The skewness and kurtosis coefficients for the variables were between -1 and +1. Therefore, the data have univariate normality (Cokluk et al., 2012). The dataset was then analyzed for multivariate normality. For this purpose, a scatter diagram matrix was examined. If the shape of the diagrams in the matrix resembles an ellipse, then the data have multiple normality (Cokluk et al., 2012). An elliptical distribution was observed with the present data. These tests meant the dataset met the assumptions of multivariate normality. All binary correlation coefficients of the variables were smaller than .90. Therefore, there are no multicollinearity problems in the dataset. Mediation analyses were performed using the JASP.

Results

Table 1 shows the correlations between all main variables in the present study (i.e., intolerance of uncertainty, differentiation of self, nomophobia, and emotion of management skills). Bivariate correlations demonstrated that all variables were moderately related to each other.

Table 1. *Descriptive statistics and bivariate correlations among variables among the total sample (N=398)*

	IU	DS	EMS	N
IU	—			
DS	-.47*	—		
EMS	-.46*	.58*	—	
N	.29*	-.43*	-.39*	—
Mean	80.66	77.30	91.81	77.17
Std. Deviation	18.88	11.77	14.32	25.11
Skewness	-.08	.01	-.10	.16
Kurtosis	-.25	-.27	-.27	-.52
Range	97	63	74	120

*p<.001. DS=Differentiation of self; EMS=Emotion management skills; IU=Intolerance of uncertainty; N=Nomophobia

Mediation analysis

As seen in Table 2, the direct effect between differentiation of self and nomophobia was statistically significant. However, the direct effect between emotion management skills and nomophobia was not.

Table 2. *Results concerning the direct effects among the total sample (N=398)*

			Estimate	Std. Error	z-value	p	95% Confidence Interval	
							Lower	Upper
DS	→	N	-.655	.012	-5.594	< .001	-.885	-.426
EMS	→	N	-.144	.096	-1.507	.132	-.332	.043

DS=Differentiation of self; EMS=Emotion management skills; IU=Intolerance of uncertainty; N=Nomophobia

When the total effect coefficients are examined, it can be seen that both the total effect between differentiation of self and nomophobia and the total effect between emotion management skills and nomophobia were statistically significant (see Table 3).

Table 3. *Results concerning the total effects among the total sample (N=398)*

			Estimate	Std. Error	z-value	p	95% Confidence Interval	
							Lower	Upper
DS	→	N	-.807	.115	-6.998	< .001	-1.033	-.581
EMS	→	N	-.229	.095	-2.734	< .01	-.445	-.073

DS=Differentiation of self; EMS=Emotion management skills; IU=Intolerance of uncertainty; N=Nomophobia

The results regarding the mediating effect of intolerance of uncertainty in the relationship between differentiation of self and nomophobia and emotion management skills and nomophobia are presented in Table 4.

Table 4. *Results concerning the indirect effects among the total sample (N=398)*

					Estimate	Std. Error	z-value	p	95% Confidence Interval	
									Lower	Upper
DS	→	IU	→	N	-.152	.042	-3.622	< .001	-.234	-.070
EMS	→	IU	→	N	-.115	.033	-3.503	< .001	-.179	-.051

DS=Differentiation of self; EMS=Emotion management skills; IU=Intolerance of uncertainty; N=Nomophobia

Indirect effects indicate that intolerance of uncertainty partly mediated the relationship between differentiation of self and nomophobia. As the direct effect of emotion management skills on nomophobia were not statistically significant, the mediating effect for these variables was not carried out. These findings show that the relationship between differentiation of self and nomophobia via intolerance of uncertainty can be explained. On the other hand the relationship between emotion management skills and nomophobia via intolerance of uncertainty cannot. Consequently, the first and second hypotheses were confirmed but the fourth and fifth hypotheses were not.

Moderation analysis

Table 5 shows that the model regarding the moderator analysis was significant ($F=48.797$, $R^2=.271$, $p<.001$). In this model, intolerance of uncertainty, differentiation of self, and interaction (intolerance of uncertainty x differentiation of self) were used as variables in predicting nomophobia. When the contributions of predictive variables to the model were examined, intolerance of uncertainty (CI=.196, .452) and differentiation of self (CI=-.961, -.550) provided a statistically significant contribution to the model. However, the interaction did not contribute statistically to the model (CI=-.001, .017). This indicates that the moderating effect of intolerance of uncertainty was not significant. When the R^2 increase due to interaction was examined, the change in R^2 was not significant (R^2 change=.006, $p>.05$). These findings indicate that the third hypothesis was not confirmed.

Table 5. The findings related to the moderating role of intolerance of uncertainty *among the total sample (N=398)*

Outcome: Nomophobia

Model Summary	R	R^2	MSE	F	df1	df2	*p*
	.520	.271	463.289	48.797	3	394	<.001

Model	coefficient	SE	*t*	*p*	95% CI	
					Lower	Upper
IU	.324	.065	4.972	<.001	.196	.452
DS	-.755	.105	-7.224	<.001	-.961	-.550
IU x DS	.008	.004	1.826	>.05	-.001	.017

DS=Differentiation of self; EMS=Emotion management skills; IU=Intolerance of uncertainty; N=Nomophobia

Table 6 shows that the model regarding the moderator analysis was significant (F=35.232, R^2=.212, *p*<.001). In this model, intolerance of uncertainty, emotion management skills, and interaction (intolerance of uncertainty x emotion management skills) were used as variables in predicting nomophobia. When the contributions of predictive variables to the model were examined, intolerance of uncertainty (CI=.282, .545) and emotion management skills (CI=-.566, -.218) provided a statistically significant contribution to the model. However, the interaction did not contribute statistically to the model (CI=-.009, .007). This indicates that the moderating effect of intolerance of uncertainty was not significant. When the R^2 increase due to interaction was examined, the change in R^2 was not significant (R^2 change= .000, *p*>.05).). These findings indicate that the sixth hypothesis was not confirmed.

Table 6. The findings related to the moderating role of intolerance of uncertainty *among the total sample (N=398)*

Outcome: Nomophobia

Model Summary	R	R^2	MSE	F	df1	df2	*p*
	.460	.212	501.02	35.232	3	394	<.001

Model	coefficient	SE	*t*	*p*	95% CI	
					Lower	Upper
IU	.414	.067	7.165	<.001	.282	.545
EMS	-.392	.089	-4.423	<.001	-.566	-.218
IU x EMS	-.001	.004	-.220	>.05	-.009	.007

DS=Differentiation of self; EMS=Emotion management skills; IU=Intolerance of uncertainty; N=Nomophobia

Discussion

The present study examined four aspects of nomophobia. First, the mediating effect of intolerance of uncertainty was tested in the relationship between (i) differentiation of self and nomophobia, and (ii) emotion management skills and nomophobia. Secondly, the moderating effect of intolerance of uncertainty was tested in the relationship between (i) differentiation of self and nomophobia, and (ii) emotion management skills and nomophobia. Findings showed that the direct effect between differentiation of self and nomophobia was statistically significant but was not significant between emotion management skills and nomophobia. Findings demonstrated that intolerance of uncertainty mediated the relationship between differentiation of self and nomophobia. On the other hand intolerance of uncertainty did not moderate in the relationship between emotion management skills and nomophobia. Also intolerance of uncertainty did not moderate the relationship between differentiation of self and nomophobia. Similarly, intolerance of uncertainty did not moderate the relationship between emotion management skills and nomophobia.

First, self-differentiation significantly predicted nomophobia. When smartphones become an integral part of personal identity and are perceived as a source that promotes self-esteem (Walsh et al., 2009, 2010), they may be possible for an individual to experience nomophobia (King et al., 2010; Yıldırım et al., 2015) alongside the development of pseudo-self (Bowen, 1978; Gilbert, 2006). Pseudo-self was defined by Bowen (1978) as an unstable identity structure as a change of one's response to individuals' reactions, and that high levels of pseudo-self-corresponds to low self-differentiation in family systems therapy. Based on related previous literature is analyzed, only one previous study (i.e., Smith, 2017) examined self-differentiation as a predictor of nomophobia. Smith (2017) noted that there was a strong relationship between fusion and nomophobia, one of the sub-dimensions of self-differentiation. A possible explanation for this situation is that the fusion, which is

characterized by the tendency to seek approval from other people, causes smartphone addiction and consequently nomophobic properties. However, Smith (2017) emphasized that well-differentiated individuals show less nomophobic features because they are more successful in dealing with stress and anxiety and managing their emotions and relationships. However, individuals with poorly differentiated exposure are more exposed to nomophobia because they do not have effective coping and emotion management skills. The findings of the present study support the hypothesis that self-differentiation affects the level of nomophobia and Smith's (2017) study is consistent with the present study's findings.

Second, intolerance of uncertainty mediated the relationship between differentiation of self and nomophobia. However the moderating effect of intolerance of uncertainty was not significant. When the related literature is examined, no research addressing the relationship between self-differentiation and intolerance of uncertainty was found. However, considering that high self-differentiation allows for intellectual decision-making with the ability to regulate emotions even in uncertain conditions (Kerr & Bowen, 1988), it can be said that self-differentiation predicts intolerance of uncertainty which is defined as a challenge related to uncertainty, innovation, and unpredictable changes (Sookman & Pinard, 1997) and associated with high levels of anxiety and stress. Consequently, in the light of the aforementioned findings, it can be said that the present study's finding that the self-differentiation predicts intolerance of uncertainty is supported.

In the literature, no previous study has directly addressed the relationship between intolerance of uncertainty and nomophobia. However, researchers who have examined nomophobia based on extended self-theory (e.g., Han et al., 2017) suggest that when users consider their smartphone as a part of their extended self, they are more likely to become attached to and/or dependent upon the device and cause separation anxiety if they are unable to use their smartphone. This would lead to nomophobia by promoting proximity-seeking

(King et al., 2014; Rubino et al., 2012; Tams et al., 2018). The important factor to emphasize is whether uncertainty tendencies play an important role in the relationship between nomophobia and control (Rubino et al., 2012). According to Rubino et al.'s (2012) demand-control-person model, in the context of smartphone use, uncertainty can create stress and control helps reduce stress. Consequently, nomophobia causes stress and nomophobia that can be facilitated by the presence of uncertainty and lack of control. In addition, Tams et al. (2018) stated that uncertainty and control were mediator variables in the relationship between nomophobia and stress, and reported that nomophobia caused stress under high uncertainty and low control. According to the uncertainty orientation theory developed by Sorrentino and Short (1986), individuals who are uncertainty-oriented are motivated by ambiguous situations, while individuals who are certainty-oriented are motivated by situations that maintain certainty about themselves and their environment (i.e., trust and familiarity). Therefore, certainty-oriented individuals utilize their smartphones as a means of avoiding negative emotions and experiences due to having a high level of intolerance of uncertainty and having a low likelihood of positive emotions and experiences. Consequently, these findings are indirectly consistent with the present study's finding that the intolerance of uncertainty predicted nomophobia.

Individuals with anxiety disorders, in stressful and anxiety situations (accompanied by intolerance of uncertainty in nomophobia, as a result of low emotion management skills) use their smartphones as a source of assurance (King et al., 2014) and as a means of providing a distraction from real-world problems (Demirci et al., 2015; Ghasempour et al., 2015; Kim et al., 2015). In addition, Davoudi et al. (2019) found that emotion management and regulation skills had predictive effects on nomophobia. Therefore, this emotion management process predicts nomophobia and intolerance of uncertainty, and intolerance of uncertainty determines the level of nomophobia. In the extant literature, findings suggest that emotional management

and regulation processes predict the level of intolerance of uncertainty (Abbate-Daga et al., 2015; Cai et al., 2018; Yuksel, 2014). Abbate-Daga et al. (2015) showed that exhibiting low tolerance when faced with uncertain situations results from low emotion regulation ability. Cai et al. (2018) suggest that the intolerance of uncertainty plays an intermediary role in the relationship between emotion regulation processes and anxiety. Yuksel (2014) concluded that there was a positive relationship between negative emotion regulation and intolerance of uncertainty, and emotion regulation skills predicted intolerance of uncertainty. As a result, these findings support the present study's findings.

Third, emotion management skills did not significantly predict nomophobia. This result appears valid given that emotion management skills and differentiation of self simultaneously predict nomophobia (see Table 2). On the other hand, emotion management skills alone make a statistically significant contribution in predicting nomophobia (see Table 6). The reason for using two different models in the moderation analysis was because there is no analysis that has carried this out simultaneously (as far as the researchers are aware). It was also found that emotion management skills alone make a statistically significant contribution in predicting nomophobia. Individuals with anxiety disorders, in stressful and anxiety situations (accompanied by intolerance of uncertainty in nomophobia, as a result of low emotion management skills) use their smartphones as a source of assurance (King et al., 2014) and as a means of providing a distraction from real-world problems (Demirci et al., 2015; Ghasempour et al., 2015; Kim et al., 2015). In addition, Davoudi et al. (2019) found that emotion management and regulation skills had predictive effects on nomophobia.

Fourth, since the regression coefficient between emotion management skills and nomophobia was not statistically significant, the mediating effect of intolerance of uncertainty in the relationship between emotion management skills and nomophobia was not tested. On the other hand, since the regression coefficient between emotion management skills and

nomophobia was significant in the moderation analysis, the moderating effect of intolerance to uncertainty in the relationship between emotion management skills and nomophobia was examined. However, the moderating effect of intolerance to uncertainty in this relationship was not statistically significant. There is no research in the literature that has previously tested the moderating effect of intolerance to uncertainty on the relationship between emotion management skills and nomophobia. Therefore, further replication studies are needed in other countries and cultures to confirm or refute the findings here.

Limitations and conclusions

The results of the present study should be considered in light of a number of limitations. The convenience sample was obtained from just two different Turkish universities and the data collected were self-report. The measurement tools were all based on self-report which are subject to well-known methodological biases, and the survey tool was cross-sectional. Future development of the model should use different assessment tools among different sample groups (both inside and outside of Turkey), and future research would benefit from the use of qualitative studies (such as studies using different target populations such as teachers, family, alongside peer evaluations) and longitudinal studies (to overcome the lack of causality testing when using cross-sectional data).

The present study may contribute to explaining and preventing a new phenomenon (i.e., nomophobia). When examining related literature, although there is research concerning frequency, risk factors, and negative consequences of nomophobia in Turkey, none of the previous research focused on prevention or intervention. By taking into consideration significant impacts of Bowen's (1978) self-differentiation along with emotion management processes associated with nomophobia, psycho-education programs need to be developed to reduce the negative impact of nomophobia and to raise awareness among those who may

experience it. The present study not only examined nomophobia, but also the direct and indirect relationships of intolerance of uncertainty, differentiation of self, and emotion management skills. Therefore, the findings here will contribute to intervention and prevention studies related to intolerance of uncertainty, differentiation of self, and emotion management skills in the context of problematic smartphone use more generally, and nomophobia more specifically.

References

Abbate-Daga, G., Quaranta, M., Marzola, E., Amianto, F., & Fassino, S. (2015). The relationship between alexithymia and intolerance of uncertainty in anorexia nervosa. *Psychopathology, 48*(3), 202–208. https://doi.org/10.1159/000381587.

Adnan, M., & Gezgin D. M. (2016). A modern phobia: Prevalence of nomophobia among college students. *Ankara University, Journal of Faculty of Educational Sciences, 49*(1), 141-158.

Aldao, A., Gee, D. G., De Los Reyes, A., & Seager, I. (2016). Emotion regulation as a transdiagnostic factor in the development of internalizing and externalizing psychopathology: Current and future directions. *Development and Psychopathology, 28*(4pt1), 927–946. https://doi.org/10.1017/s0954579416000638.

American Psychiatric Association (APA). (2013). *Diagnostic and statistical manual of mental disorders* (Fifth ed.). American Psychiatric Publishing.

Arpaci, I., Baloglu, M., Kozan, H. İ. Ö., & Kesici, Ş. (2017). Individual differences in the relationship between attachment and nomophobia among college students: the mediating role of mindfulness. *Journal of Medical Internet Research, 19*(12), e404. https://doi.org/10.2196/jmir.8847.

Boelen, P. A., & Reijntjes, A. (2009). Intolerance of uncertainty and social anxiety. *Journal of Anxiety Disorders, 23*(1), 130-135. https://doi.org/10.1016/j.janxdis.2008.04.007.

Bowen, M. (1978). *Family therapy in clinical practice*. Aronson.

Bragazzi, N. L., & Del Puente, G. (2014). A proposal for including nomophobia in the new DSM-V. *Psychology Research and Behavior Management, 7*, 155-160. https://doi.org/10.2147/prbm.s41386.

Buhr, K., & Dugas, M. . (2002). The intolerance of uncertainty scale: psychometric properties of the English version. *Behaviour Research and Therapy, 40*(8), 931–945. https://doi.org/10.1016/s0005-7967(01)00092-4.

Buyukcolpan, H. (2019). *Nomophobia, attachment styles, depression and perceived social support among university students.* (Master's thesis). Hacettepe University, Turkey.

Cai, R. Y., Richdale, A. L., Dissanayake, C., & Uljarević, M. (2018). Brief report: Inter-relationship between emotion regulation, intolerance of uncertainty, anxiety, and depression in youth with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 48*(1), 316-325. https://doi.org/10.1007/s10803-017-3318-7.

Carleton, R. N. (2016). Into the unknown: A review and synthesis of contemporary models involving uncertainty. *Journal of Anxiety Disorders, 39*, 30-43. https://doi.org/10.1016/j.janxdis.2016.02.007.

Cecen, A. R. (2006). Validity and reliability studies of the Emotions Management Skills Scale. *Turkish Psychological Counseling and Guidance Journal, 26*(3), 101-113.

Cokluk, Ö., Sekercioglu, G., & Buyukozturk, Ş. (2012). *Sosyal bilimler için çok değişkenli istatistik: SPSS ve Lisrel uygulamalari [Multivariate SPSS and LISREL applications for social sciences].* Pegem Publishing.

Dasgupta, P., Bhattacherjee, S., Dasgupta, S., Roy, J. K., Mukherjee, A., & Biswas, R. (2017). Nomophobic behaviors among smartphone using medical and engineering students in two colleges of West Bengal. *Indian Journal of Public Health, 61*(3), 199-204. https://doi.org/10.4103/ijph.ijph_81_16.

Davoudi, R., Manshaee, G., & Golparvar, M. (2019). Comparing the effectiveness of adolescent-centered mindfulness with cognitive behavioral therapy and emotion-

focused therapy on emotion regulation among adolescent girls with nomo-phobia. *Journal of Health Promotion Management*, *8*(4), 16-25.

Demirci, K., Akgönül, M., & Akpinar, A. (2015). Relationship of smartphone use severity with sleep quality, depression, and anxiety in university students. *Journal of Behavioral Addictions, 4*(2), 85-92. https://doi.org/10.1556/2006.4.2015.010.

Dragan, M. (2015). Difficulties in emotion regulation and problem drinking in young women: The mediating effect of metacognitions about alcohol use. *Addictive Behaviors, 48,* 30–35. https://doi.org/10.1016/j.addbeh.2015.04.008.

Dugas, M. J., Freeston, M. H., & Ladouceur, R. (1997). Intolerance of uncertainty and problem orientation in worry. *Cognitive Therapy and Research, 21*(6), 593-606.

Freeston, M. H., Rhéaume, J., Letarte, H., Dugas, M. J., & Ladouceur, R. (1994). Why do people worry? *Personality and Individual Differences*, *17*(6), 791-802. https://doi.org/10.1016/0191-8869(94)90048-5.

Gezgin D. M., Hamutoglu, N. B., Sezen-Gultekin, G., & Ayas, T. (2018). The relationship between nomophobia and loneliness among Turkish adolescents. *International Journal of Research in Education and Science, 4*(2), 358-374.

Ghasempour, A., & Mahmoodi-Aghdam, M. (2015). The role of depression and attachment styles in predicting students' addiction to cell phones. *Addiction & Health, 7*(3-4), 192-197.

Gikas, J., & Grant, M. M. (2013). Mobile computing devices in higher education: Student perspectives on learning with cell phones, smartphones & social media. *The Internet and Higher Education, 19*, 18-26. https://doi.org/10.1016/j.iheduc.2013.06.002.

Gilbert, R. M. (2006). *Extraordinary leadership: Thinking systems, making a difference.* Leading Systems Press.

Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and

 dysregulation: Development, factor structure, and initial validation of the Difficulties

 in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment,*

 26(1), 41-54. https://doi.org/10.1023/b:joba.0000007455.08539.94.

Griffiths, M. D. (2005). A 'components' model of addiction within a biopsychosocial

 framework. *Journal of Substance Use, 10,* 191-197.

 https://doi.org/10.1080/14659890500114359.

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes:

 Implications for affect, relationships, and well-being. *Journal of Personality and*

 Social Psychology, 85(2), 348-362. https://doi.org/10.1037/0022-3514.85.2.348.

Han, S., Kim, K. J., & Kim, J. H. (2017). Understanding nomophobia: Structural equation

 modeling and semantic network analysis of smartphone separation

 anxiety. *Cyberpsychology, Behavior, and Social Networking, 20*(7), 419-427.

 https://doi.org/10.1089/cyber.2017.0113.

Hodgson, L. K., & Wertheim, E. H. (2007). Does good emotion management aid forgiving?

 Multiple dimensions of empathy, emotion management and forgiveness of self and

 others. *Journal of Social and Personal Relationships*, *24*(6), 931-949.

 https://doi.org/10.1177/0265407507084191.

Isik, E., & Bulduk, S. (2013). Psychometric properties of the Differentiation of Self

 Inventory-Revised in Turkish Adults. *Journal of Marital and Family Therapy, 41*(1),

 102-112. https://doi.org/10.1111/jmft.12022.

Kerr, M., & Bowen, M. (1988). *Family evaluation: An approach based on Bowen Theory*. W.

 W. Norton & Company.

King, A. L. S., Valença, A. M., & Nardi, A. E. (2010). Nomophobia: The mobile phone in

 panic disorder with agoraphobia: Reducing phobias or worsening of dependence?

Cognitive and Behavioral Neurology, 23(1), 52-54. https://doi.org/10.1097/wnn.0b013e3181b7eabc

King, A. L. S., Valença, A. M., Silva, A. C., Sancassiani, F., Machado, S., & Nardi, A. E. (2014). "Nomophobia": Impact of cell phone use interfering with symptoms and emotions of individuals with panic disorder compared with a control group. *Clinical Practice & Epidemiology in Mental Health, 10*(1), 28–35. https://doi.org/10.2174/1745017901410010028.

Kopelman S., Shoshana J., Chen L. 2009. Re-narrating positive relational identities in organizations: Self-narration as a mechanism for strategic emotion management in interpersonal interactions. In Roberts L., & M. Dutton J. (Eds.), *Exploring positive identities and organizations: Building a theoretical and research foundation* (pp. 265-288). Routledge & CRC Press.

Kozan, H. İ. Ö., Kesici, Ş., & Baloglu, M. (2017). Multivariate relationships between emotional management skills and forgiveness. *Journal of Values Education, 15*(34), 193-215.

Lin, C.-Y., Griffiths, M. D., & Pakpour, A. H. (2018). Psychometric evaluation of Persian Nomophobia Questionnaire: Differential item functioning and measurement invariance across gender. *Journal of Behavioral Addictions, 7*(1), 100–108. https://doi.org/10.1556/2006.7.2018.11.

Lin, Y. H., Chang, L. R., Lee, Y. H., Tseng, H. W., Kuo, T. B., & Chen, S. H. (2014). Development and validation of the Smartphone Addiction Inventory (SPAI). *PloS One, 9*(6), e98312. https://doi.org/10.1371/journal.pone.0098312.

Lind, C., & Boschen, M. J. (2009). Intolerance of uncertainty mediates the relationship between responsibility beliefs and compulsive checking. *Journal of Anxiety Disorders, 23*(8), 1047-1052. https://doi.org/10.1016/j.janxdis.2009.07.005.

Mannetti, L., Pierro, A., & Livi, S. (2002). Explaining consumer conduct: From planned to self-expressive behavior. *Journal of Applied Social Psychology, 32*(7), 1431-1451. https://doi.org/10.1111/j.1559-1816.2002.tb01445.x.

Mannion, K. (2018). *The effect of smartphones on anxiety: An attachment issue or fear of missing out?* (Master's thesis). Seton Hall University, USA.

Mao, H. J., Li, H. J., Chiu, H., Chan, W. C., & Chen, S. L. (2012). Effectiveness of antenatal emotional self-management training program in prevention of postnatal depression in Chinese women. *Perspectives in Psychiatric Care*, *48*(4), 218-224. https://doi.org/10.1111/j.1744-6163.2012.00331.x.

McCraty, R., Atkinson, M., Tomasino, D., Goelitz, J., & Mayrovitz, H. N. (1999). The impact of an emotional self-management skills course on psychosocial functioning and autonomic recovery to stress in middle school children. *Integrative Physiological and Behavioral Science, 34*(4), 246-268. https://doi.org/10.1007/bf02688693.

McEvoy, P. M., & Mahoney, A. E. (2012). To be sure, to be sure: Intolerance of uncertainty mediates symptoms of various anxiety disorders and depression. *Behavioral Therapy, 43*(3), 533-545. https://doi.org/10.1016/j.beth.2011.02.007.

Mennin, D. S., Fresco, D. M., Ritter, M., & Heimberg, R. G. (2015). An open trial of emotion regulation therapy for generalized anxiety disorder and coocurring depression. *Depression and Anxiety, 32*(8), 614-623. https://doi.org/10.1002/da.22377.

Nawaz, I., Sultana, I., Amjad, M. J., & Shaheen, A. (2017). Measuring the enormity of nomophobia among youth in Pakistan. *Journal of Technology in Behavioral Science, 2*(3-4), 149-155. https://doi.org/10.1007/s41347-017-0028-0.

Przybylski, A. K., Murayama, K., DeHaan, C. R., & Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out. *Computers in Human Behavior, 29*(4), 1841-1848. https://doi.org/10.1016/j.chb.2013.02.014.

Roemer, L., & Orsillo, S. M. (2005). An acceptance-based behavior therapy for generalized anxiety disorder. In S. M. Orsillo & L. Roemer (Eds.), *Acceptance and mindfulness based approaches to anxiety* (pp. 213-240). Springer.

Rosen, L., Carrier, L. M., Miller, A., Rokkum, J. ve Ruiz, A. (2016). Sleeping with technology: Cognitive, affective, and technology usage predictors of sleep problems among college students. *Sleep Health, 2*(1), 49-56. https://doi.org/10.1016/j.sleh.2015.11.003.

Rubino, C., Perry, S. J., Milam, A. C., Spitzmueller, C., & Zapf, D. (2012). Demand-control-person: Integrating the demand-control and conservation of resources models to test an expanded stressor-strain model. *Journal of Occupational Health Psychology, 17*(4), 456-472. https://doi.org/10.1037/a0029718.

Sahin, S., Ozdemir, K., Unsal, A., & Temiz, N. (2013). Evaluation of mobile phone addiction level and sleep quality in university students. *Pakistan Journal of Medical Sciences Quarterly, 29*(4), 913-918. https://doi.org/10.12669/pjms.294.3686.

Sari, S. & Dag, D. (2009). Belirsizliğe tahammülsüzlük ölçeği, endişe ile ilgili olumlu inançlar ölçeği ve endişenin sonuçları ölçeğinin Türkçe'ye uyarlanması, geçerliliği ve güvenilirliği. *Anatolian Journal of Psychiatry, 10,* 261-270.

Savci, M. (2019). Validity and reliability of the Smartphone Craving Scale: Modifying and adaptation of the Penn Alcohol Craving Scale to the Turkish culture as Smartphone Craving Scale. *Anatolian Journal of Psychiatry, 20*(Supplement 1), 5-14. http://doi:10.5455/apd.13549.

Savci, M., & Aysan, F. (2017). Technological addictions and social connectedness: Predictor effect of Internet addiction, social media addiction, digital game addiction and smartphone addiction on social connectedness. *Dusunen Adam: The Journal of*

Psychiatry and Neurological Sciences, 30(3), 202-216. https://doi.org/10.5350/dajpn2017300304.

Savci, M., Griffiths, M. D. (2019). The development of the Turkish Craving for Internet Gaming Scale (CIGS): A validation study. *International Journal of Mental Health and Addiction.* https://doi.org/10.1007/s11469-019-00114-0.

Savci, M., Tekin, A., & Elhai, J. D. (2020). Prediction of problematic social media use (PSU) using machine learning approaches. *Current Psychology.* https://doi.org/10.1007/s12144-020-00794-1.

Skowron, E. A., & Friedlander, M. L. (1998). The differentiation of self-inventory: Development and initial validation. *Journal of Counseling Psychology, 45*(3), 235-246. https://doi.org/10.1037/0022-0167.45.3.235.

Skowron, E. A., & Schmitt, T. A. (2003). Assessing interpersonal fusion: Reliability and validity of a new DSI fusion with others subscale. *Journal of Marital and Family Therapy*, *29*(2), 209-222. https://doi.org/10.1111/j.1752-0606.2003.tb01201.x.

Smith, A. K. (2017). *The cell and the self-exploring the relationship between cell phone involvement and differentiation of self.* (Doctoral thesis). School of Education and Human Development of the George Washington University, Washington, US.

Sookman, D., & Pinard, G. (1997, September). Vulnerability and response to unpredictability, newness and change in obsessive compulsive disorder: Measurement and implications for treatment. *Paper presented at the XXVII Congress of European Association for Behavioural and Cognitive Therapies*, Venice, Italy.

Sorrentino, R. M., & Short, J. C. (1986). Uncertainty orientation, motivation and cognition. In R. M. Sorrentino & E. T. Higgins (Ed.). *The handbook of motivation and cognition: foundations of social behaviour* (pp. 379-403). Guilford Press.

Tams, S., Legoux, R., & Léger, P. M. (2018). Smartphone withdrawal creates stress: A moderated mediation model of nomophobia, social threat, and phone withdrawal context. *Computers in Human Behavior, 81*, 1-9. https://doi.org/10.1016/j.chb.2017.11.026.

Tavolacci, M. P., Meyrignac, G., Richard, L., Dechelotte, P., & Ladner, J. (2015). Problematic use of mobile phone and nomophobia among French college students. *European Journal of Public Health, 25*(Suppl. 3), 206. https://doi.org/10.1093/eurpub/ckv172.088.

Walsh, S. P., White, K. M., & Young, R. M. (2009). The phone connection: A qualitative exploration of how belongingness and social identification relate to mobile phone use amongst Australian youth. *Journal of Community and Applied Social Psychology, 19*, 225-240. https://doi.org/10.1002/casp.983.

Walsh, S. P., White, K. M., Cox, S., & Young, R. M. (2011). Keeping in constant touch: The predictors of young Australians' mobile phone involvement. *Computers in Human Behavior, 27*(1), 333-342. https://doi.org/10.1016/j.chb.2010.08.011.

Walsh, S. P., White, K. M., Young, R. M. (2010). Needing to connect: The effect of self and others on young people's involvement with their mobile phones. *Australian Journal of Psychology, 62*(4), 194-203. https://doi.org/10.1080/00049530903567229.

Watson, J. C., & Greenberg, L. S. (2017). *Emotion-focused therapy for generalized anxiety.* American Psychological Association.

Yildirim, C. (2014). *Exploring the dimensions of nomophobia: Developing and validating a questionnaire using mixed methods research.* (Master's thesis). Ames, Iowa State University, US.

Yildirim, C., & Correia, A.-P. (2015). Exploring the dimensions of nomophobia: Development and validation of a self-reported questionnaire. *Computers in Human Behavior, 49*, 130-137. https://doi.org/10.1016/j.chb.2015.02.059.

Yook, K., Kim, K. H., Suh, S. Y., & Lee, K. S. (2016). Intolerance of uncertainty, worry, rumination in major depressive disorder and generalized anxiety disorder. *Journal of Anxiety Disorders, 24*(6), 623-628. https://doi.org/10.1016/j.janxdis.2010.04.003.

Yuksel, B. (2014). *Attachment, positive and negative emotion regulation, and intolerance of uncertainty in anxiety: searching for an integrative model.* (Master's thesis). Hacettepe University, Ankara, Turkey.

Zlomke, K. R., & Jeter, K. M. (2014). Stress and worry: Examining intolerance of uncertainty's moderating effect. *Anxiety, Stress, & Coping, 27*(2), 202-215. https://doi.org/10.1080/10615806.2013.835400.