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RESEARCH ARTICLE / ARAŞTIRMA MAKALESİ

# The Effect of Emotion Dysregulation, Affect, Boredom, and Social Context on State Nomophobia among University Students: An Experience Sampling Study (State Nomophobia)

## Üniversite Öğrencilerinde Duygu Düzenleme Güçlüğü, Duygulanım, Can Sıkıntısı ve Sosyal Bağlamın Durumsal Nomofobiye Etkisi: Deneyim Örnekleme Çalışması

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**ABSTRACT**

This study aimed to examine whether state-based psychological constructs (emotion dysregulation, positive affect, negative affect, boredom, satisfaction with the social context) and trait-based psychological constructs (nomophobia, emotion dysregulation, positive affect, negative affect, boredom proneness) predict state nomophobia. This study also examined the variation of daily nomophobia scores during the week and the difference between nomophobic and non-nomophobic individuals. The experience sampling method was used because it allows simultaneous evaluation of the internal and situational determinants of the research variables as the data are collected within the real-world context. Two groups were used (non-nomophobia/nomophobia; *N* = 42). Data were collected from university students using standard measurement tools and momentary assessments for a week via the PIEL Survey smartphone application. In this 2-level study, the level 1 analysis was based on 1679 observations and the level 2 analysis was based on 42 observations. The random intercept and slope model and the growth curve model were used. The results showed that state-based psychological constructs predicted state nomophobia, but trait-based psychological constructs failed to predict it (except trait nomophobia). Daily nomophobia scores decreased throughout the week. The decrease in the nomophobia group was slower, and their daily scores were higher than those in the non-nomophobia group. The findings suggest that momentary assessments should be used to make inferences about the determinants of state nomophobia experienced in daily life. As far as is known, there has been no experience sampling study examining state nomophobia. Determining the factors that may cause nomophobia may provide scientific insight into the content of programs developed for the prevention and treatment of nomophobia. An in-depth investigation of nomophobia using momentary assessments along with retrospective assessments may provide a more holistic understanding of nomophobia and a new perspective for future nomophobia studies.

**Keywords:** Affect, boredom, emotion dysregulation, experience sampling method, nomophobia

**ÖZ**

Bu çalışmada durumsal psikolojik yapıların (duygu düzenleme güçlüğü, pozitif duygulanım, negatif duygulanım, can sıkıntısı, sosyal bağlamdan memnuniyet) ve karakter-temelli (sürekli) psikolojik yapıların (nomofobi, duygu düzenleme güçlüğü, pozitif duygulanım, negatif duygulanım, can sıkıntısı eğilimi) durumsal nomofobiyi yordama gücünü araştırmak amaçlanmıştır. Ayrıca günlük nomofobi puanlarının hafta boyunca değişimini ve nomofobik

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bireyler ile nomofobik olmayan bireyler arasındaki farkı incelemek de amaçlanmıştır. Bu çalışmada deneyim örnekleme yöntemi kullanılmıştır. Deneyim örnekleme yönteminde veriler günlük yaşam bağlamında tekrarlı olarak toplanmaktadır. Bu sayede araştırma değişkenlerinin içsel ve dışsal belirleyicilerinin eş zamanlı olarak değerlendirilmesi mümkündür. Çalışmada iki grup kullanılmıştır (nomofobik olmayan grup /nomofobik grup; *N* = 42). Veriler üniversite öğrencilerinden standart ölçme araçları ve anlık değerlendirmelerle bir hafta boyunca PIEL Survey telefon uygulaması üzerinden toplanmıştır. Bu iki seviyeli çalışmada düzey 1 analizi 1679 gözleme, düzey 2 analizi ise 42 gözleme dayanmaktadır. Rastgele kesen ve eğim modeli ile büyüme eğrisi modeli kullanılmıştır. Sonuçlar, durumsal psikolojik yapıların durumsal nomofobiyi yordadığını, ancak karakter-temelli psikolojik yapıların durumsal nomofobiyi yordamadığını göstermiştir (sürekli nomofobi hariç). Hafta boyunca günlük nomofobi puanları düşüş göstermiştir. Nomofobi grubundaki düşüş nomofobik olmayan gruba göre daha azdır ve nomofobi grubunun puanları daha yüksektir. Bulgular, durumsal nomofobinin belirleyicileri hakkında çıkarımlarda bulunmak için anlık değerlendirmelerin kullanılması gerektiğini göstermektedir. Bilindiği kadarıyla nomofobiyi inceleyen deneyim örnekleme çalışması bulunmamaktadır. Nomofobiye neden olabilecek faktörlerin belirlenmesi, nomofobinin önlenmesi ve tedavisi için geliştirilen programların içeriğine ilişkin bilimsel bir alt yapı sunabilir. Geriye dönük değerlendirmeler ve anlık değerlendirmeler kullanılarak nomofobinin derinlemesine incelenmesi, nomofobinin bütüncül bir şekilde anlaşılmasına katkıda bulunabilir ve gelecekteki nomofobi çalışmalarına yeni bir bakış açısı sağlayabilir.

**Anahtar Kelimeler:** Can sıkıntısı, deneyim örnekleme yöntemi, duygu düzenleme güçlüğü, duygulanım, nomofobi

During the Coronavirus (COVID-19) pandemic, many countries imposed lockdowns to control the virus, and most people avoided physical contact with others to protect themselves. Consequently, the smartphone was used more than ever because it allowed for maintaining social relationships and fulfilling responsibilities (online meetings/classes) and daily routines (banking, shopping, etc.) (Zwilling, 2022). Since connection with the world was established through the smartphone, not being able to use it has caused more fear than usual (Caponnetto et al., 2021). In the literature, such fear is defined as no-mobile-phone phobia (nomophobia) (King et al., 2010). Nomophobia is an intense discomfort, anxiety, and stress caused by the absence of a smartphone. It involves the fear of not being able to communicate, losing connectedness, not being able to access information, and giving up convenience (Yildirim, 2014).

Before going any further, this study aimed to investigate the momentary nomophobia symptoms that individuals experience in daily life using the experience sampling method (ESM) (See Study Design section). This study has two objectives that have not been examined by past research. The first one was to determine the predictors of momentary nomophobia symptoms. State-based psychological constructs (state emotion dysregulation, state positive affect, state negative affect, state boredom, satisfaction with the social context) and trait-based psychological constructs (trait nomophobia, trait emotion dysregulation, trait positive affect, trait negative affect, boredom proneness) were selected as predictors of momentary nomophobia symptoms. The second objective was to examine the fluctuations in nomophobia symptoms during the week. Although Enez (2021) found that trait emotion dysregulation, trait positive affect, trait negative affect, and trait boredom were significant predictors of trait nomophobia, the rationale and importance of conducting the current research as a follow-up study can be explained as follows.

First, many psychopathologies are characterized by fluctuations in symptoms. Therefore, momentary nomophobia symptoms may differ from relatively stable trait nomophobia symptoms measured by retrospective measurements (Myin-Germeys et al., 2018). This study aimed to show that nomophobia symptoms can change depending on internal and external factors during the day and on the day during the week (Fidancı et al., 2021). Examining the weekly pattern of nomophobia and identifying both individual tendencies and momentary factors that lead to the exacerbation of momentary nomophobia symptoms in daily life may contribute to the development of more effective prevention and treatment programs.

Second, since people are often inconsistent across time and situations, traits may not always predict how individuals think and behave in a given situation and time (Gana et al., 2019; Nezlek, 2007). Therefore, generalizing past findings about trait nomophobia to momentary nomophobia symptoms may lead to incorrect inferences. Similarly, since between-person findings may differ from within-person findings, between-person findings may not generalize to within-person processes. Therefore, assessing fluctuations in nomophobia and its predictors at multiple time points is an ideal method to determine the direction of causality (Myin-Germeys et al., 2009). For example, based on the finding that boredom proneness leads to trait nomophobia (Enez, 2021), it can be inferred that people with a low tendency to boredom are less likely to suffer from nomophobia.

However, it is not known whether any individual, regardless of their tendency, experiences nomophobia when experiencing boredom during the day. Therefore, it can be assumed that the predictors of the actual nomophobia symptoms are still not fully determined. Since nomophobia causes physical, cognitive and psychological problems (e.g., physical injuries, concentration problems, loneliness; Bragazzi & Puente, 2014; Devi & Dutta, 2022), it is important to identify not only the tendencies that cause nomophobia but also the momentary factors that lead to the exacerbation of nomophobia symptoms in daily life. Such an in-depth investigation of nomophobia can increase the awareness of clinicians and educational policymakers and provide scientific information about the content of nomophobia prevention and treatment programs (Devi & Dutta, 2022).

Lastly, this study is one of the pioneering studies using ESM in the nomophobia literature (See Study Design section). This study may provide a new perspective for future studies and highlight the need to reconsider the psychological constructs that have been investigated with a cross-sectional design so far. That is, both the clinical and academic contributions of this study can fill such gaps in the literature and practice.

**Conceptualization of Nomophobia**

Past research has mostly used standard measurements to investigate nomophobia (Jahrami et al., 2023). The severity of nomophobia is determined through instructions in which people are asked to rate their average or typical nomophobia experience on standardized measurement tools (e.g., Running out of battery in my smartphone would scare me; Yildirim & Correia, 2015). Therefore, it is possible to argue that past research has evaluated nomophobia as a trait because traits are permanent characteristics that refer to the tendency to think and act in a certain way (Gana et al., 2019).

Conceptualizing nomophobia as a trait may indicate that nomophobia severity remains relatively the same across time and situations, and only nomophobes experience chronic anxiety in the absence of a smartphone (Yildirim, 2014). However, several momentary factors may affect the severity of nomophobia (i.e., cognitive and emotional processes, situational factors, and interpersonal experiences). Non-nomophobes, who score below the cut-off score on standard measurement tools (Yildirim & Correia, 2015), may also experience nomophobia symptoms in some situations. For example, not being able to use the smartphone in emergencies may cause more intense anxiety than usual, regardless of whether a person is nomophobic or not (Caponnetto et al., 2021). Therefore, nomophobia can also be a context-dependent phenomenon. Since states are the temporal and context-dependent responses of individuals (Gana et al., 2019), context-dependent nomophobia can be called state nomophobia. Although state nomophobia is not a widely accepted term in the literature, it has been used throughout this article to refer to the momentary fear and anxiety of not being able to use the smartphone. That is, in this study, nomophobia is considered both a dynamic phenomenon that fluctuates throughout the day and week and a relatively permanent phenomenon that reflects an individual tendency.

**Theoretical Framework**

In formulating the rationale of this study, the compensatory internet use theory (CIUT; Kardefelt-Winther, 2014) and the uses and gratifications theory (UGT; Blumler, 1979) were used because these theories are recommended to investigate nomophobia (Durak, 2019). UGT argues that technological devices are utilized to meet affective, personal integrative, and cognitive needs (Blumler, 1979). CIUT argues that technology use is a compensatory process in dealing with psychological problems (Kardefelt-Winther, 2014). These theories argue that individuals use smartphones to regulate emotions, control positive/negative affect, and reduce boredom (Blumler, 1979; Elhai et al., 2019; Kanjo et al., 2017; Kardefelt-Winther, 2014; Katz et al., 2008; Wegmann et al., 2018). These theories also argue that social context affects technology usage patterns (Blumler, 1979; Kardefelt-Winther, 2014). Based on these assumptions, emotion dysregulation, positive affect, negative affect, boredom, and satisfaction with the current social context were identified as potential determinants of state nomophobia.

## Predictors of State Nomophobia

### *Emotion Dysregulation*

Emotion dysregulation (EDR) is defined as the lack of awareness and clarity of emotional responses, the inability to accept emotional responses, the inability to use effective strategies, and the difficulties in engaging in goal-directed behaviors and controlling impulsive behaviors when experiencing negative affect (Gratz & Roemer, 2004, p. 43). EDR can be relatively stable over time and vary between individuals (trait EDR), and also be dynamic and vary depending on the current context (state EDR) (Lavender et al., 2017). Trait EDR is a tendency impacted by biological, developmental, and environmental factors such as impulsivity and parenting style (Thompson, 2019). State EDR is a more dynamic phenomenon that can change moment-to-moment depending on internal or external factors such as negative self-evaluations and negative social interactions (Lavender et al., 2017).

Trait EDR decreases the capacity to use adaptive emotion regulation (ER) strategies (Gratz & Roemer, 2004; Thompson, 2019). Individuals with trait EDR are more likely to regulate emotions through smartphone apps that provide immediate relief. Smartphone use as an ER strategy may strengthen the belief that smartphone use is the best solution to regulate emotions (Blalock et al., 2016; Hoffner & Lee, 2015). Therefore, trait EDR may elicit state nomophobia symptoms by causing the need for it at all times.

Individuals who are not prone to EDR may experience state EDR during the day (Daros et al., 2019). When positive and negative emotions are unmanageable, people may want to control their emotions with the help of others and smartphones (Weiss et al., 2015). During the pandemic, one of the most important sources of emotional support was smartphone-based support (Colasante et al., 2022). Therefore, the benefits of the smartphone may increase the need for the smartphone and anxiety about its absence (Rodríguez et al., 2020).

Although the association between trait EDR and trait nomophobia has been revealed (Catone et al., 2020; Celik & Atilla, 2018; Enez, 2021), trait EDR may not always provide accurate information about state EDR (Blalock et al., 2016; Daros et al., 2019) and state nomophobia. Therefore, the impact of trait EDR and state EDR on state nomophobia should be investigated in a daily life context to identify the real causes of nomophobia. Therefore, the following hypotheses were tested:

*H1.* The tendency of individuals to experience emotion dysregulation is positively associated with state nomophobia symptoms.

*H2.* An increase in emotion dysregulation in a given time period is positively associated with an increase in nomophobia symptoms during that period.

***Positive Affect and Negative Affect***

Affect can be relatively stable over time and vary between people (trait affect), and also be dynamic and differ depending on the current context (state affect; Watson et al., 1988). Affect has two orthogonal dimensions: positive affect (PA) and negative affect (NA). State PA encompasses the combination of individuals' momentary positive emotions, and trait PA encompasses individuals' general tendency to feel positive emotions. State NA encompasses a combination of temporary negative emotions, and trait NA reflects the tendency to feel negative emotions (Gray & Watson, 2007)

Individuals high in trait PA may be more prone to suffer from state nomophobia because of their desire to use the smartphone for social purposes (Ku et al., 2013; Watson et al., 1988) because socialization is possible through it anytime and anywhere (Biolcati et al., 2017). Moreover, as people tend to share positive life events with others (Verduyn et al., 2015), increased state PA may also cause an immediate desire to communicate through the smartphone to share positive emotions. Since the smartphone was almost the only way to socialize and share emotions during the pandemic, both individuals' tendencies and momentary increases in PA may trigger state nomophobia (Caponnetto et al., 2021). Furthermore, since smartphone use increases state PA, the desire to maintain increased state PA may cause anxiety when the smartphone cannot be used (Gable et al., 2004), triggering state nomophobia.

Trait NA and state NA are characterized by the use of maladaptive coping strategies (Watson et al., 1988). Trait NA and state NA lead people to use the smartphone as a coping tool because it offers them an easy solution to escape from affective problems (Lukoff et al., 2018; Wegmann et al., 2018). Consequently, both trait NA and state NA may make people more vulnerable to state nomophobia because of the increased need for smartphones. Moreover, when state NA is intense, people may need immediate smartphone-based emotional support for relief (Villanueva et al., 2020). Considering that state NA was experienced more intensely during the COVID-19 (Oliveira Carvalho et al., 2022), the benefits of smartphones on state NA may lead to dependence on it (Wegmann et al., 2018), triggering state nomophobia.

Although the effect of inter-individual differences in trait affect on trait nomophobia has been revealed (Delavarpour et al., 2019; Enez, 2021), it is still unknown whether fluctuations in affect impact state nomophobia. To determine the real predictors of nomophobia, the impact of both trait affect and momentary fluctuations in affect on momentary nomophobia symptoms should be examined. Therefore, the following hypotheses were tested:

*H3.* The tendency of individuals to experience *a)* negative affect and *b)* positive affect are positively associated with state nomophobia symptoms.

*H4.* An increase in *a)* state negative affect and *b)* state positive affect in a given time period is positively associated with an increase in nomophobia symptoms during that period.

### *Boredom*

Boredom is a situation-specific aversive state (state boredom) and a personality trait (boredom proneness). State boredom is defined as "a state of relatively low or high arousal and dissatisfaction, which is attributed to an inadequately stimulating situation" (Mikulas & Vodanovich, 1993, p. 3). Boredom proneness (BP) is defined as "one's proneness toward experiencing boredom" (Farmer & Sundberg, 1986, p. 5).

Boredom-prone individuals tend to use smartphones to deal with chronic boredom because it offers them the stimulation they need regardless of time and place (Regan et al., 2020). Since boredom-prone individuals cannot stay away from the smartphone to eliminate the negative impact of their tendencies (Biolcati & Cani, 2015), they may be more afraid of being without it during the day.

Likewise, state boredom causes an urge to change the current environment (Mercer-Lynn et al., 2014), but this was not possible because of the restriction of outdoor activities during the pandemic. Bored individuals can use smartphones to reduce their dissatisfaction with the environment (Zhao et al., 2021). However, smartphone use can weaken the ability to cope with boredom (Pielot et al., 2015). Weakened coping skills may trigger state nomophobia by causing the belief that boredom cannot be reduced without a smartphone.

Evidence has revealed that BP is positively correlated with trait nomophobia (Regan et al., 2020) and predicts trait nomophobia (Enez, 2021; Ozturk & Cosanay, 2020). However, no study has investigated the effect of state boredom and BP on momentary nomophobia symptoms. When considering the causal effect of boredom on nomophobia, separating the within-person dynamics from the stable between-person differences is a necessary step to identify the real causes of state nomophobia. Therefore, the following hypotheses were tested:

*H5.* The tendency of individuals to experience boredom is positively associated with state nomophobia symptoms.

*H6.* An increase in state boredom in a given time period is positively associated with an increase in nomophobia symptoms during that period.

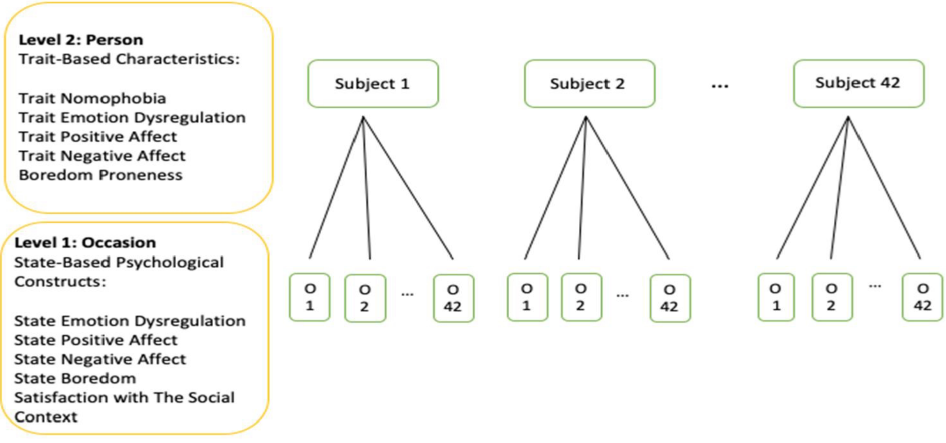
### *Satisfaction with the Social Context*

Previous studies have revealed that context is a significant predictor of smartphone use (Cohen & Lemish, 2003; Pielot et al., 2017). However, no study has investigated the association between state nomophobia and satisfaction with the social context. As individuals are more likely to share their positive experiences with others, increased satisfaction may increase a desire to share the positive aspects of the current context on social networks or communicate through the smartphone (Verduyn et al., 2015). Therefore, it can be assumed that satisfaction with the context may increase the need for the smartphone because of sharing motivation. The possibility of not being able to use it can trigger state nomophobia. Therefore, the following hypothesis was tested:

*H7.* Increased satisfaction with the social context in a given time period is positively associated with an increase in nomophobia symptoms during that period.

The hypotheses given above are presented in Figure 1.

**Figure 1.** *Predictors of State Nomophobia*




*Note*. O = Occasion.

### *Day of the Week*

As mentioned above, although there are studies examining the predictors of trait nomophobia, no study has examined the effect of time on momentary nomophobia symptoms. Therefore, in addition to determining the predictors of state nomophobia, the relationship between the day of the week and state nomophobia was also investigated to gain an in-depth understanding of nomophobia.

Pielot et al. (2014) revealed that 79% of smartphone notifications were received on weekdays, and users responded to the notifications faster on weekdays than on weekends. Shwetak et al. (2006) found that individuals tended to keep their smartphones within arm's reach on weekdays. Deng et al. (2018) found that smartphone usage time decreased from Monday to Saturday. If smartphone usage changes depending on the day, the severity of state nomophobia may also change depending on the day. According to these findings, it may decrease toward the weekend. Moreover, university education was online in Turkey during the pandemic, and the smartphone enabled students to continue their education. That is, not being able to use it was almost equivalent to not being able to access education (Fidancı et al., 2021), which may intensify nomophobia symptoms on weekdays. It can also be assumed that nomophobes generally experience more intense state nomophobia, so the decrease in state nomophobia over the week may be less in nomophobes. As the day-dependent variation in state nomophobia was not investigated, this study tested the following hypotheses:

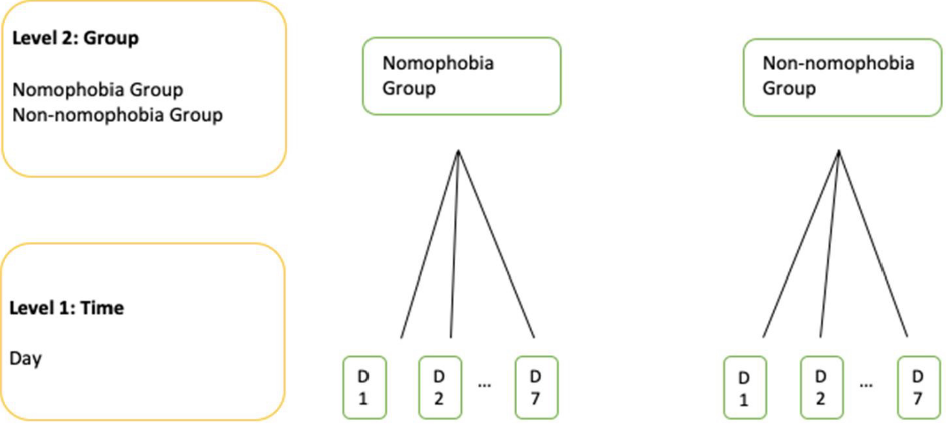
*H8.* Daily nomophobia scores decrease from Monday to Sunday.

*H9.* Nomophobes' daily nomophobia scores are higher than non-nomophobes' scores throughout the week.

*H10.* The decrease in daily nomophobia scores of nomophobes throughout the week is less than that of non-nomophobes.

These hypotheses are presented in Figure 2.

**Figure 2.** *Predictors of Daily Nomophobia*




*Note*. D = Day.

## Method

### Study Design

To investigate state nomophobia in a real-life context, and examine how individuals' relatively permanent characteristics and temporal experiences affect nomophobia, the ESM approach was used. ESM is a structured diary method in which individuals are asked to report their thoughts, emotions, symptoms, and the current context in daily life (Myin-Germeys et al., 2009, p. 1533). ESM allows simultaneous evaluation of the internal and situational determinants of research variables and captures the actual experience and dynamic fluctuations over time rather than the recalled experience. Therefore, it reduces the recall bias in overestimating or underestimating the severity of symptoms and the memory-experience gap by providing real-time feedback (Myin-Germeys et al., 2009).

### Participants

The prevalence of nomophobia among university students is above average (Jahrami et al., 2023), and students suffer from nomophobia more than working adults (Erdem et al., 2017). Therefore, participants were selected among university students. For participant selection, a convenient sampling procedure was applied. Individuals who used drugs and had a psychiatric diagnosis in the last six months were not included in the study. Individuals who scored below the cut-off point according to the General severity index score (< 63) in the Brief Symptom Inventory were invited to participate in the study (Sahin & Durak, 1994).

With guidelines, data were collected from 42 students because this study is a 2-level study and 15 participants are recommended for each level (Berkel et al., 2017; Consolvo & Walker, 2003). Although the sample size is considered as a small sample size for a cross-sectional study, data were collected from more than the number of participants required for such a study. The inclusion criteria were being a university student, having a smartphone, and scoring less than 60 or more than 99 on the Nomophobia questionnaire-Turkish form (NMP-Q-TR). This scoring range was chosen because the cut-off score is 60 for the low level and 100 for the high level of nomophobia (Yildirim et al., 2016). The participants who scored more than 99 were considered the nomophobia group, and those who scored less than 60 were considered the non-nomophobia group. Of the total sample, 14 (33.3%) were male and 28 (66.7%) were female ($N$ = 42). Their ages ranged from 18 to 34 years ($M$ = 22.17, $SD$ = 2.45).

## Materials

### *Demographic Information Form*

The form was used to determine the demographic characteristics of the participants, namely age and gender.

### *Nomophobia Questionnaire*

To assess trait nomophobia, the NMP-Q was used. It was developed by Yildirim and Correia (2015), and the Turkish version (NMP-Q-TR) was validated by Yildirim et al. (2016). The NMP-Q-TR is a 7-point Likert-type scale and involves 20 items. The Cronbach alpha coefficient of the NMP-Q-TR was .92. In this study, the Cronbach alpha coefficient was .92.

### *Difficulties in Emotion Regulation Scale*

To assess trait EDR, the Difficulties in Emotion Regulation Scale (DERS) was used. It was developed by Gratz and Roemer (2004), and the Turkish version (DERS-TR) was validated by Ruganci and Gencoz (2010). The DERS-TR is a 5-point Likert-type scale and involves 35 items. The Cronbach alpha coefficient of the DERS-TR was .94. In this study, the coefficient was .94.

### *Positive and Negative Affect Schedule*

To assess trait affect, the Positive and Negative Affect Schedule (PANAS) was used. It was developed by Watson et al. (1988), and the Turkish version (PANAS-TR) was validated by Gencoz (2000). It is a 5-point Likert-type scale and involves 20 items and two subscales. The Cronbach alpha coefficient was .86 for the NA subscale and .83 for the PA subscale. In this study, the coefficient was .62 for the PA subscale and .77 for the NA subscale.

### *Boredom Proneness Scale*

To assess BP, the short version of the Boredom Proneness Scale (BPS-SR) was preferred. It was developed by Struk et al. (2016), and the Turkish form (BPS-SR-TR) was validated by Koc et al. (2018). The scale has eight items and is a 7-point Likert-type scale. The Cronbach alpha coefficient of the BPS-SR-TR was .86. The coefficient was .86 in this study.

### *ESM Questionnaire*

An ESM questionnaire was developed by the researchers to collect data in momentary assessments via the PIEL Survey smartphone application. ESM questionnaires should take less than two minutes to obtain more reliable results (Myin-Germeys et al., 2018). Therefore, the questionnaire had 10 items, and responses were given on a 5-point Likert-type scale (1= *not at all* to 5= *very much*). Four items were aimed to measure state nomophobia. These items were developed based on the NMP-Q-TR, and attention was given to the selection of sentences that cover the dimensions of nomophobia. For example, respondents were asked “Since the last questionnaire, have you felt discomfort due to not being able to check your calls, messages, notifications, and emails?”. Two items were developed to measure momentary difficulties in the regulation of positive and negative emotions based on the DERS-TR. The participants reported whether they experienced difficulty in differentiating, clarifying, and controlling emotions since the last questionnaire. One item was added to measure state NA. The participants rated the level of negative emotions since the last questionnaire because state NA reflects people's temporary experiences of negative emotions. One item measured state PA. As state PA reflects people's short-term experiences of positive emotions (Gray & Watson, 2007), the participants rated the level of positive emotions since the last questionnaire. As recommended by Todman (2013), state boredom was measured by asking the participants to report their level of state boredom since the last questionnaire. One item measured the level of satisfaction with the social context. The participants reported satisfaction with the social context since the last questionnaire (see Appendix 1).

Unlike standard measurement tools, psychometric analyses of ESM questionnaires are not usually performed (Nezlek, 2020), but the validity of the ESM questionnaire was questioned in this study. The Cronbach alpha coefficient of the ESM questionnaire was .81. To examine validity, Pearson correlation coefficients were calculated between the means of the ESM question(s) (i.e. where occasions were averaged within-person) and the corresponding trait scales (Mneimne et al., 2019; Nezlek, 2020). Results showed that the correlations between the mean of the state nomophobia questions and the NMP-Q-TR ($r$ = .73, $p$ < .001), the mean of the state EDR questions and the DERS-TR ($r$ = .42, $p$ = .005), the mean of the state NA question and the PANAS-TR NA subscale ($r$ = .37, $p$ = .018), and the mean of the state boredom question and the BPS-SR-TR ($r$ = .46, $p$ = .002) were statistically significant. Although the correlation between the mean of the state PA question and the PANAS-TR PA subscale was positive, it was not statistically significant ($r$ = .18, $p$ = .125). Since there is no corresponding scale measuring satisfaction with the social context, no correlation could be calculated for the social context question. Similar to the results of a previous study (Mneimne et al., 2019), these results can be acceptable for ESM questionnaires because unlike standard scales, ESM questionnaires should contain a small number of questions and aim to detect momentary changes rather than tendencies. Therefore, ESM questionnaires may not measure a construct as broadly as standard scales, but this does not mean that they are not valid (Nezlek, 2020). For example, in this study, state PA was measured with a sentence asking about the level of positive emotions, while the PANAS measures the level of several specific emotions. That is, the positive but non-significant correlation between them may be due to differences in wording and/or sample size ($N$ = 42).

**Procedure**

Data were collected during the 2020-2021 academic year. Ethical approval was obtained from the Ethics Committee of Ankara Yıldırım Beyazıt University (Document number: 2019-502, Date: 27/12/2019). The study was conducted with APA ethical standards. Participation was voluntary and informed consent was given to the participants. First, a pilot study was conducted. The comprehensibility of the initial version of the ESM questionnaire was evaluated by five academicians and 10 students. The final version of the questionnaire was developed on the basis of their feedback (see Appendix 2). Lastly, data were collected from five university students for seven days via the PIEL Survey. Data collected in the pilot study were excluded from the analyses.

As recommended, a seven-day and signal/time-contingent protocol was used (Christensen et al., 2003; Consolvo & Walker, 2003). The frequency of observations was six (Conner et al., 2007). The participants accepted the same ESM questionnaire six times a day (10.00, 12.00, 14.00, 16.00, 18.00, 20.00) for seven consecutive days starting from Mondays. The PIEL Survey smartphone application was used to set a timeframe for completing the ESM questionnaires, control the real-time when the ESM questionnaires were completed, and control the participants' compliance with the study. The results of the participants who answered at least 80% of the total questionnaires were included in the analysis (acceptable compliance rate > 80%) (Myin-Germeys et al., 2018).

**Data Analyses**

The Statistical Package for Social Sciences 23 (SPSS 23) was used for the descriptive statistics. The skewness and kurtosis values were determined to be between +1.96 and -1.96 as a measure of normal distribution of the data (Tabachnick & Fidell, 2007). A one-way analysis of variance (ANOVA) test was used to compare the nomophobic group and non-nomophobic group on the questionnaires. The ESM data were analyzed using hierarchical linear modeling (HLM) in the HLM 8 software. The restricted maximum likelihood estimation method was preferred. The expectation-maximization algorithm was used as an iterative procedure (Raudenbush & Bryk, 2002). The random intercept and slope model and the growth curve model were used (Nezlek, 2020). The -2 Log-Likelihood (–2LL) values of the null models were used as a baseline for comparing the further models (Raudenbush & Bryk, 2002). The lower limit of the reliability value for the random effects was determined as .10 (Raudenbush et al., 2019). Cohen's classification was used to categorize the effect size of level 1 and level 2 variances (Cohen, 1988). The HLM results were interpreted with robust standard errors. The significance level was set as .05 in the statistical analyses.

As recommended (Raudenbush & Bryk, 2002), person-mean centering was used for the level 1 predictors and grand-mean centering was used for the level 2 predictors in the random intercept and slope model. To obtain more accurate information about the change over time and to reduce memory bias in the growth curve model, it is recommended to prefer measurements taken at different times of the day instead of daily reports (Noë et al., 2017). Thus, for the level 1 analysis, the average nomophobia scores of the participants for each day were calculated. The daily mean score of nomophobia was used as the outcome variable (daily nomophobia). For level 2, the data set used in the random intercept and slope model was used. In the final growth curve model, the level 1 predictors were the linear and quadratic effects of the day, and the level 2 predictor was group. Day was a categorical variable (coded as 0= Monday, ...., 6= Sunday). The group was a dummy codded variable and represented the individuals in the nomophobia group (coded as 0= non-nomophobia group and 1= nomophobia group). All predictors were categorical and dummy-coded, so no centering procedure was applied (See Nezlek, 2020).

## Results

Level 1 analysis was based on 1679 observations, and level 2 analysis was based on 42 observations. No outliers were detected in the outlier detection analysis. The results of the one-way ANOVA tests performed to compare the mean scores of the nomophobia group and the non-nomophobia group on the questionnaires are given in Appendix 3.

### Random Intercept and Slope Model

The descriptive statistics of the variables are represented in Table 1. The skewness and kurtosis values indicate that the data are normally distributed.

**Table 1.** *Means, Standard Deviations, Ranges, Skewness and Kurtosis Values of the Variables*

| Variable | *N* | *M* | *SD* | Range | Skewness | Kurtosis |
|---|---|---|---|---|---|---|
| Level 1 | | | | | | |
| State Nomophobia | 1679 | 7.29 | 3.84 | 20.00 | .93 | -.33 |
| State EDR | 1679 | 3.63 | 1.94 | 10.00 | 1.03 | .10 |
| State PA | 1679 | 2.86 | 1.14 | 5.00 | .00 | -.72 |
| State NA | 1679 | 2.22 | 1.20 | 5.00 | .53 | -.97 |
| State Boredom | 1679 | 2.31 | 1.27 | 5.00 | .49 | -1.05 |
| SC | 1679 | 3.58 | .99 | 5.00 | -.72 | .18 |
| Level 2 | | | | | | |
| Trait Nomophobia | 42 | 4.03 | 1.94 | 5.50 | .99 | 1.14 |
| Trait EDR | 42 | 2.39 | .66 | 3.05 | -.36 | .06 |
| Trait PA | 42 | 3.40 | .52 | 3.30 | .76 | .69 |
| Trait NA | 42 | 2.25 | .64 | 2.80 | .34 | .09 |
| BP | 42 | 3.19 | 1.32 | 5.88 | .00 | -2.10 |

*Note. N*= Number, *M* = Mean, *SD* = Standard deviation, EDR= Emotion dysregulation, PA= Positive affect, NA= Negative affect, SC= Social context, BP= Boredom proneness.

The null model was used to calculate the intraclass correlation coefficient (ICC) and examine if there is variability in the state nomophobia scores at the within-person and between-person levels using the –2LL values. Results from the null model are represented in Table 2. The equation for the null model was as follows:

State nomophobiati = $\beta_{00} + r_{0i} + e_{ti}$

**Table 2.** *Parameter Estimates of the Null Model in The Random Intercept and Slope Model*

| Null model | | | | | |
|---|---|---|---|---|---|
| Fixed effects | β | *SE* | *df* | *t* | *p* |
| Intercept ($\beta_0$) | 7.26***<br>[6.30, 8.22] | .49 | 41 | 14.80 | <.001 |
| Random effects | Variance | *SD* | *df* | $c^2$ | *p* |
| Within-person (e) | 4.67<br>[.44, 8.90] | 2.16 | | | |
| Between-person ($r_0$) | 10.25***<br>[3.98, 16.52] | 3.20 | 41 | 3671.38 | <.001 |
| Goodness of fit | | | | | |
| Deviance | 7538.01 | | | | |
| Parameters | 2 | | | | |
| AIC | 7542.01 | | | | |
| BIC | 7541.25 | | | | |

*Note*. ****p* < .001, AIC= Akaike information criterion, BIC= Bayesian information criterion, *SE*= Standard error. Values in square brackets indicate the 95% confidence interval for each coefficient.

According to the formula (ICC = $\tau^{00}/\tau^{00} + \sigma^2$) (Kwok et al., 2008), the ICC was .69 (10.25 / [10.25 + 4.67]), showing that 69% of the variance in state nomophobia was due to interindividual differences (level 2), while 31% was due to intraindividual differences (level 1). The reliability values of the random effects were above the specified criteria (> .10).

In Model 1, the state EDR and state boredom slopes were predicted as a random effect according to the final estimation of the variance components. Results from Model 1 are represented in Table 3. The equation for Model 1 was as follows:

State nomophobia$_{ti}$ = $\beta_{00}$+$\beta_{01}$∗(Trait nomophobia$_i$) + $\beta_{02}$∗(Trait emotion dysregulation$_i$) + $\beta_{03}$∗(Trait PA$_i$) + $\beta_{04}$∗(Trait NA$_i$) + $\beta_{05}$*(Boredom proneness$_i$) + $\beta_{10}$ *(State emotion dysregulation$_{ti}$) + $\beta_{20}$∗(State PA$_{ti}$) + $\beta_{30}$∗(State NA$_{ti}$) + $\beta_{40}$∗(State boredom$_{ti}$) + $\beta_{50}$∗ (Social context$_{ti}$) + $r_{0i}$ + $r_{1i}$ *(State emotion dysregulation$_{ti}$) + $r_{4i}$*(State boredom$_{ti}$) + $e_{ti}$

**Table 3.** *Parameter Estimates of Model 1 and Model 2*

| | Model 1 | | | | | Model 2 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Fixed effects | β | *SE* | *df* | *t* | *p* | β | *SE* | *df* | *t* | *p* |
| For Intercept 1 ($p_0$) | | | | | | | | | | |
| Intercept 2 ($\beta_{00}$) | 7.26*** [6.61,7.91] | .33 | 36 | 21.89 | <.001 | 7.26*** [6.59,7.93] | .34 | 40 | 21.59 | <.001 |
| Trait nomophobia | 1.16*** [.75,1.57 ] | .21 | 36 | 5.61 | <.001 | 1.23*** [.90,1.56] | .17 | 40 | 7.31 | <.001 |
| Trait EDR | .72 [-1.36,2.8] | 1.06 | 36 | .68 | .500 | - | - | - | - | - |
| Trait PA | -.03 [1.36,1.30] | .68 | 36 | -.05 | .959 | - | - | - | - | - |
| Trait NA | .04 [-.96,1.04] | .51 | 36 | .07 | .941 | - | - | - | - | - |
| BP | -.21 [-1.13,.71] | .47 | 36 | -.44 | .664 | - | - | - | - | - |
| For Slope ($p_0$) | | | | | | | | | | |
| State EDR | .42*** [.24,.60] | .09 | 41 | 4.76 | <.001 | .42*** [.24,.60] | .09 | 41 | 4.76 | <.001 |
| State PA | .21** [.05,.37] | .08 | 1550 | 2.63 | .009 | .21** [.05,.37] | .08 | 1550 | 2.63 | .009 |
| State NA | .16* [.00,.32] | .08 | 1550 | 2.09 | .036 | .16* [.00,.32] | .08 | 1550 | 2.08 | .037 |
| State boredom | .31*** [.13,.49] | .09 | 41 | 3.52 | .001 | .31*** [.13,.49] | .09 | 41 | 3.52 | .001 |
| SC | .28* [.04,.52] | .12 | 1550 | 2.40 | .016 | .28* [.04,.52] | .12 | 1550 | 2.40 | .016 |
| Random effects Variance | | *SD* | *df* | $c^2$ | *p* | Variance | *SD* | *df* | $c^2$ | *p* |
| Within-person (e) | 3.48 [1.81,5.15] | .85 | | | | 3.48 [-.19,7.15] | 1.87 | | | |
| Between-person ($r_0$) | 5.31*** [.80,9.82] | 2.30 | 35 | 2228.96 | <.001 | 4.90*** [.57,9.23] | 2.21 | 39 | 2292.54 | <.001 |
| State EDR | .20*** [-.66,1.06] | .44 | 40 | 138.80 | <.001 | .19*** [-.67,1.05] | .44 | 40 | 138.79 | <.001 |
| State boredom | .13*** [-.58,.84] | .36 | 40 | 77.63 | <.001 | .13*** [-.58,.84] | .36 | 40 | 76.63 | <.001 |
| Goodness of fit | | | | | | | | | | |
| Deviance | 7122.34 | | | | | 7126.23 | | | | |
| Parameters | 7 | | | | | 7 | | | | |
| AIC | 7136.34 | | | | | 7140,23 | | | | |
| BIC | 7133,68 | | | | | 7137.57 | | | | |
| Pseudo $R^2$ (level 1) | .25 | | | | | .25 | | | | |
| Pseudo $R^2$ (level 2) | .48 | | | | | .52 | | | | |

*Note*. * $p < .05$, ** $p < .01$, ***$p < .001$. EDR= Emotion dysregulation, PA= Positive affect, NA= Negative affect, BP= Boredom proneness, SC= Social context, AIC= Akaike information criterion, BIC= Bayesian information criterion, SE= Standard error. Values in square brackets indicate the 95% confidence interval for each coefficient.

The Chi-square deviance test was significant ($\chi^2$ (5) = 415.67, $p$ < .001). As shown in Table 3, the main effects were statistically significant for all level 1 predictors. At level 2, the effect of trait nomophobia on state nomophobia was statistically significant ($\beta$= 1.16, SE= .21, $p$ < .001). However, the effects of the other level 2 predictors were not statistically significant. That is *H2, H4a, H4b, H6*, and *H7* were confirmed, but *H1, H3a, H3b*, and *H5* were not confirmed. Therefore, Model 2 was created by eliminating the non-significant predictors from Model 1. Results from Model 2 are represented in Table 3. The equation for Model 2, which was the final model, was as follows:

State nomophobia$_{ti}$ = $\beta_{00}$ + $\beta_{01}$*(Trait nomophobia$_i$) + $\beta_{10}$ *(State emotion dysregulationt$_{ti}$) + $\beta_{20}$*(State PA$_{ti}$) + $\beta_{30}$*(State NA$_{ti}$) + $\beta_{40}$*(State boredom$_{ti}$) + $\beta_{50}$* (Social context$_{ti}$) + $r_{0i}$ + $r_{1i}$ *(State emotion dysregulation$_{ti}$) + $r_{4i}$*(State boredom$_{ti}$) + $e_{ti}$

The deviance from the null model to Model 2 was statistically significant ($\chi^2$ (7) = 411.77, $p$ < .001). As shown in Table 3, the intercept was significant ($\beta$ = 7.26, $SE$ = .34, $p$ < .001). At level 1, state EDR ($\beta$ = .42, $SE$ = .09, $p$ < .001), state PA ($\beta$ = .21, $SE$ = .08, $p$ = .009), state NA ($\beta$ = .16, $SE$ = .08, $p$ = .037), state boredom ($\beta$ = .31, $SE$ = .09, $p$ < .001) and satisfaction with the social context ($\beta$ = .28, $SE$ = .12, $p$ = .016) were significant predictors of state nomophobia. At level 2, trait nomophobia was a significant predictor of state nomophobia (β = 1.23, $SE$ = .17, $p$ < .001). According to these results; *H2, H4a, H4b, H6*, and *H7* were confirmed. The effect size for level 1 and level 2 variances was large (Pseudo $R^2$ ≥ .25). The reliability estimates are given in Table 4.

**Table 4.** *Reliability Estimates of the Models in The Random Intercept and Slope Model*

| Random level 1 coefficient | Reliability estimate | | |
|---|---|---|---|
| | Null model | Model 1 | Model 2 |
| Intercept ($\pi_0$) | .99 | .98 | .98 |
| State EDR | - | .62 | .62 |
| State boredom | - | .47 | .47 |

*Note.* EDR= Emotion dysregulation

## The Growth Curve Model

The mean score of daily nomophobia was 7.29 (*SD*= 3.40, skewness= .92, kurtosis= -.30). The ICC was 0.86 (10.13 / [10.13 + 1.66]). Results from the null model are represented in Table 5. The equation for the null model was as follows:

Daily nomophobia$_{ti}$ = $\beta_{00} + r_{0i} + e_{ti}$

First, the linear effect of the day was tested. The deviance from the null model to the linear growth model ($\chi$2 (3) = 10.31, $p$ < .001) and the intercept (β = 7.70, $SE$ = .56, $p$ < .001) were significant. There was a significant linear decrease in daily nomophobia over seven days (β = −.14, $SE$ = .05, $p$ = .007). Then, polynomial growth curve models were used to investigate the deviation from linearity. The deviance from the linear growth model to the quadratic growth model ($\chi^2$ (3) = 17.40, $p$ < .001), and the intercept (β = 8.04, $SE$ = .55, $p$ < .001) were significant. The linear effect was negative (β = −.55, $SE$ = .14, $p$ < .001), the quadratic effect was positive (β = .07, $SE$ = .02, $p$ = .004). The cubic effect (β = −.01, $SE$ = .03, $p$ > .05) and the Chi-square deviance test ($\chi^2$ (4) = 8.15, $p$ > .05) were not significant. Thus, the linear and quadratic effects remained in Model 3. They specified as random. Lastly, the group was added as a level 2 predictor. Results from Model 3 are represented in Table 5. The equation for Model 3 was as follows:

Daily nomophobia$_{ti}$= $\beta_{00} + \beta_{01} * (Group_i) + \beta_{10} * (Day_{ti}) + \beta_{11} * (Group_i * Day_{ti}) + \beta_{20} * (Day_{ti}^2) + r_{0i} + r_{1i} * (Day_{ti}) + r_{2i} * (Day_{ti}^2) + e_{ti}$

**Table 5.** *Parameter Estimates of the Null Model and Model 3*

| | Null Model | | | | | Model 3 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Fixed effects | β | *SE* | *df* | *t* | *p* | β | *SE* | *df* | *t* | *p* |
| For Intercept 1 ($\pi_0$) | | | | | | | | | | |
| Intercept 2 ($\beta_{00}$) | 7.27***<br>[6.31,8.23] | .49 | 41 | 14.82 | <.001 | 5.23***<br>[4.76,5.70] | .24 | 40 | 21.79 | <.001 |
| Group | - | - | - | - | - | 5.62***<br>[4.29,6.95] | .68 | 40 | 8.20 | <.001 |
| For Slope ($\pi_0$) | | | | | | | | | | |
| Day | - | - | - | - | - | -.42**<br>[-.67, -.17] | .13 | 40 | -3.31 | .002 |
| Day*Group | - | - | - | - | - | -.27**<br>[-.47, -.07] | .10 | 40 | -2.81 | .008 |
| Day$^2$ | - | - | - | - | - | .07*<br>[.03,.11] | .02 | 41 | 3.08 | .004 |
| Random effects | | | | | | Variance | SD | df | $\chi^2$ | p |
| Within-person (e) | 1.66<br>[-.87,4.19] | 1.29 | | | | 1.00<br>[-.96,2.96] | 1.00 | | | |
| Between-person ($r_0$) | 10.13***<br>[3.90,16.36] | 3.18 | 41 | 1795.27 | <.001 | 4.63***<br>[.42,8.84] | 2.15 | 40 | 282.37 | <.001 |
| Day | - | - | - | - | - | .28**<br>[-.76,1.32] | .53 | 40 | 65.39 | .007 |
| Day$^2$ | - | - | - | - | - | .01**<br>[-.19,.21] | .10 | 41 | 72.03 | .002 |
| Goodness of fit | | | | | | | | | | |
| Deviance | 1138.25 | | | | | 1049.49 | | | | |
| Parameters | 2 | | | | | 7 | | | | |
| AIC | 1142.25 | | | | | 1063.49 | | | | |
| BIC | 1141.49 | | | | | 1060.83 | | | | |
| Pseudo $R^2$ (level 1) | - | | | | | .39 | | | | |
| Pseudo $R^2$ (level 2) | - | | | | | .54 | | | | |

*Note.* * $p < .05$, ** $p < .01$, ***$p < .001$. AIC= Akaike information criterion, BIC= Bayesian information criterion, *SE*= Standard error. Values in square brackets indicate the 95% confidence interval for each coefficient.

The Chi-square deviance test was significant ($\chi^2(5) = 88.76, p < .001$). As shown in Table 5, the intercept was significant ($\beta = 5.23, SE = .24, p < .001$). There was a negative linear effect of the day ($\beta = -.42, SE = .13, p = .002$) and a positive quadratic effect of the day on daily nomophobia ($\beta = .07, SE = .02, p = .004$), confirming *H8*. Participants' nomophobia scores from Monday to Tuesday dropped by .42 but the decrease slowed by .07 per day. At level 2, the effect of the group was positive ($\beta = 5.62, SE = .68, p < .001$), confirming *H9*. That is, being nomophobic led to a 5.62-point increase in daily nomophobia scores. The group by day interaction effect was negative ($\beta = -.27, SE = .10, p = .008$), confirming *H10*. That is, the change in nomophobia scores for nomophobic participants per day was .27 points slower than for non-nomophobic participants. The effect size for level 1 and level 2 variances was large (Pseudo $R^2 \leq .25$). The reliability statistic was. 86 for the intercept, .38 for the linear effect of time, and .43 for the quadratic effect of time.

## Discussion

This study has revealed that nomophobia is a dynamic construct that changes according to internal and contextual factors. Although trait EDR (Catone et al., 2020; Celik Atilla, 2018; Enez, 2021), trait NA/PA (Delavarpour et al., 2019; Enez, 2021), and BP (Enez, 2021; Ozturk & Cosanay, 2020) significantly predicted trait nomophobia, they were not significant predictors of state nomophobia. However, trait nomophobia and state-based constructs (state EDR, state PA/NA, boredom, and satisfaction with the social context) significantly affected momentary nomophobia symptoms. This study also revealed that nomophobia changes depending on the day, decreasing systematically from Monday to Saturday. The bilateral relations of the research variables with state nomophobia are explained in the following sections.

**Emotion Dysregulation**

The results revealed that momentary difficulties in emotion regulation intensified state nomophobia more than the tendency of emotion dysregulation. That is, during periods when individuals experience emotion regulation problems, momentary nomophobia symptoms also increase. These findings are in parallel with the assumptions of CIUT (i.e., overuse of technological tools to cope with emotions) (Kardefelt-Winther, 2014) and UGT (i.e., technology use as an ER strategy) (Katz et al., 2008).

Control over the current environment is important for ER (Colombo et al., 2020). If people cannot change their environment, they may use smartphones as a distraction strategy to regulate their negative emotions, such as watching videos (Kenny et al., 2016). Individuals may also want to reduce the arousal caused by intense positive emotions and may use smartphones to downregulate their positive emotions (Weiss et al., 2015). Moreover, individuals tend to prefer smartphone communication to regulate their current emotions with the help of others (Colasante et al., 2022). Especially during the COVID-19, emotional support was mostly provided through smartphones (Caponnetto et al., 2021). Regulating emotions through smartphone-based support may strengthen individuals' beliefs about its beneficial effects (Rodríguez et al., 2020). However, smartphone use for coping with overwhelming emotions may decrease the capacity to find adaptive regulation strategies (Blalock et al., 2016). Therefore, individuals may exhibit nomophobic behaviors if they rely only on the smartphone to regulate their emotions. That is, the need for the smartphone to cope with momentary problems in the ER may trigger state nomophobia.

**Positive and Negative Affect**

Similar to EDR, this study showed that momentary upward fluctuations in state affect observed within an individual, rather than inter-individual differences in trait affect, increased momentary nomophobia symptoms. In other words, the need for a smartphone during periods of intense affective states triggers nomophobia symptoms during that period. These results are in line with the assumptions of UGT and CIUT because these theories argue that individuals use technological devices to control intense affective states (Elhai et al., 2019; Kanjo et al., 2017).

To be more specific, people may use the smartphone to boost state PA through positive content on social media (Villanueva et al., 2020). The desire to maintain an increased state PA level may cause them to worry about times when they cannot use the smartphone. Additionally, sharing positive emotional experiences with others increases state PA (Gable et al., 2004). However, sharing may cause subsequent actions on the smartphone, such as controlling likes on the posts. Such motivations may elicit momentary nomophobia symptoms during times of increased state PA.

Similarly, people may prefer to share their negative emotional experiences with others over the smartphone (Villanueva et al., 2020) or private information in online support groups

(Bareket-Bojmel & Shahar, 2011). As the safest way of sharing during the pandemic was smartphone-based communication (Caponnetto et al., 2021), the desire to cope with state NA may increase the need for it, especially in users who also experience state EDR.

Moreover, state NA informs people to change the current environment (Reeve, 2018), but it was not possible because of the restrictions of COVID-19. Like state EDR and boredom, if it is not possible to change the environment, people may try to change it by escaping from the real world to the virtual world. That is, the smartphone can be used as a coping tool to reduce the negative effect of the environment on state NA (Nett et al., 2011; Villanueva et al., 2020). However, smartphone use may become an automatic escape from state NA and coping skills may weaken (Lukoff et al., 2018). The belief that they cannot deal with the intense level of state NA may elicit state nomophobia.

**Boredom**

This study revealed that intense boredom experienced in a given period, rather than individuals' tendency to boredom, intensified nomophobia symptoms during that period. As discussed in CIUT and UGT (Wegmann et al., 2018), the effect of exposure to monotonous stimuli can be reduced through the smartphone because it is used as a behavioral avoidance strategy to relieve boredom. Considering that boredom increased because of the restriction of outdoor activities during the pandemic, individuals have become more dependent on smartphones to reach the optimum level of arousal (Zhao et al., 2021). However, smartphone use may turn into a dysfunctional coping mechanism (Nett et al., 2011). Therefore, similar to state EDR and state affect, the need for a smartphone during periods of intense boredom intensifies nomophobia during those periods.

**Satisfaction with the Social Context**

As stated in UGT (Blumler, 1979) and CIUT (Kardefelt-Winther, 2014), social context affects technology use. This study also revealed that momentary nomophobia symptoms were intensified due to increased satisfaction with the social context. Since people tend to share their positive experiences with others, increased satisfaction may increase a desire to share the positive aspects of the context on social media or communicate via the smartphone (Verduyn et al., 2015). The desire to capture and share every pleasant moment in daily life may increase the need for it (Bayer et al., 2016). However, smartphone use may not always be possible for various reasons, such as lack of a battery. Therefore, its absence at such moments may trigger state nomophobia. That is, the need for a smartphone in a period when satisfaction with the environment is high increases nomophobia during that period.

Moreover, the smartphone might lead to a more positive assessment of the context because it provides users with entertainment, sociability, and emotional support (Kanjo et al., 2017; Pielot et al., 2015; Rodríguez et al., 2020). If people use it frequently to enhance the current conditions, they may need it in any environment, even if they are satisfied with the conditions. This possible implicit link may lead to state nomophobia. Since this assumption is only an inference, it should be investigated with qualitative studies.

**Day of the Week**

This study has also shown that nomophobia is a dynamic psychological construct that is affected not only by internal and contextual factors but also by the day of the week. The results showed that daily nomophobia scores decreased in a quadratic trend throughout the week. The decrease in the nomophobes was slower than that in the non-nomophobes. The daily nomophobia scores of the non-nomophobes were lower than those of the nomophobes. It is possible to say that users high in trait nomophobia usually experience more intense nomophobia symptoms throughout the day, indicating that trait nomophobia can provide accurate information about the severity of state nomophobia.

The finding that nomophobia is more intense on weekdays can be attributed to several reasons. First, due to online education in Turkey during the pandemic, students spent more time on smartphones on weekdays (Fidancı et al., 2021). Students might have experienced an intense fear of not being able to attend online classes in the absence of it on weekdays. Second, the Turkish Government imposed curfew during the weekends during the pandemic. People might have tended to engage in outdoor activities on Mondays after the two-day quarantine. They might have needed the smartphone more on Mondays for social purposes, such as posting photos on social media. Third, EDR, NA, and boredom were the highest on Mondays. Given their predictive effect on state nomophobia, high scores in these predictors might have caused nomophobia to peak on Mondays. Lastly, evidence revealed that smartphone usage decreased from Monday to Saturday (Deng et al., 2018). 79% of notifications were accepted on weekdays and these notifications were answered in a shorter time (Pielot et al., 2014). These findings indicate that individuals need their smartphones more on weekdays, triggering nomophobia on weekdays. Since these assumptions are only inferences, they should be investigated with a qualitative study design.

In summary, the findings have shown that individuals experience more intense nomophobia symptoms during periods when they experience problems in emotion regulation, intense negative/positive affective states, and intense boredom. Similarly, in periods when the satisfaction with the environment increases, the fear of not being able to use the smartphone also increases. Moreover, the results have shown that nomophobia symptoms are experienced more intensely on weekdays when smartphone usage time is high (Deng et al., 2018), indicating that nomophobia is also affected by the day of the week. Furthermore, considering the findings that individuals' tendencies did not predict state nomophobia, this study has shown that state-trait associations are weak, similar to previous studies (Blalock et al., 2016; Daros et al., 2019). It is possible to say that people are not always consistent across time and situations, so their tendencies may not always predict momentary nomophobia symptoms (Nezlek, 2007). Therefore, using trait assessment to make inferences about temporal relationships between dynamic psychological constructs may lead to inaccurate inferences.

The findings are in line with the assumptions of UGT (Blumler, 1979) and CIUT (Kardefelt-Winther, 2014). UGT argues that individuals intentionally use technological devices depending on their personal integrative, affective, and cognitive needs (e.g., need for pleasant emotional experiences, socialization, and arousal) (Blumler, 1979; Leung & Wei, 2000). CIUT argues that smartphone use is a compensatory process for coping with unmet needs and psychological problems (e.g., to escape from distress, emotions, and negative affect) (Elhai et al., 2019; Kardefelt-Winther, 2014). These theories also argue that technology use is affected by the social context (Blumler, 1979; Kardefelt-Winther, 2014).

Based on their assumptions and the current findings, it is possible to argue that one of the motivations for smartphone use is coping because the smartphone provides emotional support, distraction, and entertainment that provide relief from psychological problems, and satisfy affective and cognitive needs (Colasante et al., 2022; Kuss et al., 2018; Wegmann et al., 2018). The smartphone also meets personal integrative needs by allowing the sharing of positive emotions and satisfaction with the environment (Gable et al., 2004), supporting the current findings. That is, the motivations for technology use identified by UGT (Blumler, 1979) and CIUT (Kardefelt-Winther, 2014) may trigger state nomophobia by increasing the need for the smartphone.

Based on the findings, it is possible to make some suggestions about the treatment and prevention of nomophobia. Since students experienced nomophobia symptoms more intensely on weekdays, when organizing educational programs, it should be considered that online education may increase nomophobia (Fidancı et al., 2021). Therefore, this finding should be considered in educational planning. Nomophobia prevention programs organized in schools should also raise students' awareness of this issue.

Moreover, students should be trained in adaptive emotion and affect regulation strategies and leisure time management skills to prevent them from using the smartphone as a regulation strategy. Behavioral activation techniques can be used to reduce the negative effects of boredom, emotions, and affective states in nomophobia interventions (Quigley & Dobson, 2017). For example, students should be encouraged to participate in face-to-face social activities or hobbies. As mindfulness and emotion-focused therapy help to accept and gain control over affective states, boredom and emotions (Creswell, 2017; Greenberg, 2004), their techniques should be used in nomophobia interventions. Similarly, mindfulness therapy can encourage individuals to enjoy the moment instead of sharing their satisfaction with the environment through the smartphone (Creswell, 2017).

Continuing with the limitations, data were collected only from university students. Future studies should collect data from different age groups. Also, two-thirds of the participants were female. As data were collected through the smartphone, and data collection started on Mondays, the fear of missing the questionnaires might have increased the state nomophobia on Mondays. Future studies should repeat this study with the paper-pencil data collection method and start data collection on random days. Lastly, repeating the results with a larger sample is important for the generalizability of the results.

As a final note, nomophobia is a psychological problem that is rapidly increasing in prevalence and causes physical, cognitive and psychological problems (Bragazzi & Puente, 2014). Unlike previous studies, this study examined the momentary determinants of state nomophobia in the context of daily life. The findings of this study, which have high ecological validity, may increase the awareness of clinicians, educational policymakers, and users about nomophobia. Such findings may also contribute to developing effective prevention and treatment programs by revealing the course of nomophobia severity and the momentary determinants of it. Additionally, this study has revealed that psychological constructs (e.g., emotion dysregulation) that are generally considered to be relatively permanent are also dynamic constructs affected by time, internal factors, and external factors. That is, this study provides more detailed information about the antecedents of nomophobia and the course of psychological constructs in daily life than a cross-sectional research design. As the ESM approach is not common in academic studies, this study may guide future studies by emphasizing the importance of ecological research.

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## References / Kaynakça

Bareket-Bojmel, L., & Shahar, G. (2011). Emotional and interpersonal consequences of self-disclosure in a lived, online interaction. *Journal of Social and Clinical Psychology, 30*(7), 732-759. https://doi.org/10.1521/jscp.2011.30.7.732

Bayer, J., Ellison, N., Schoenebeck, S., & Falk, E. (2016). Sharing the small moments: Ephemeral social interaction on snapchat. *Information, Communication & Society, 19*, 956-977. https: //doi.org/10.1080/1369118X.2015.1084349

Berkel, N., Ferreira, D., & Kostakos, V. (2017). The experience sampling method on mobile devices. *ACM Computing Surveys, 50*(6), 93-133. https://doi.org/10.1145/3123988

Biolcati, R., & Cani, D. (2015). Feeling alone among friends: Adolescence, social networks and loneliness. *Webology, 12*(2). Retrieved from: http://www.webology.org/2015/v12n2/a138.pdf

Biolcati, R., Mancini, G., & Trombini, E. (2017). Proneness to boredom and risk behaviors during adolescents' free time. *Psychological Reports, 121*(2), 303-323. https://doi.org/10.1177/0033294117724447

Blalock, D., Kashdan, T., & Farmer, A. (2016). Trait and daily emotion regulation in social anxiety disorder. *Cognitive Therapy and Research, 40*(3), 416-425. https://doi.org/10.1007/s10608-015-9739-8

Blumler, J. (1979). The role of theory in uses and gratifications studies. *Communication Research, 6*(1), 9-36. https://doi.org/10.1177/009365027900600102

Bragazzi, N., & 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

Caponnetto, P., Inguscio, L., Valeri, S., Maglia, M., Polosa, R., Lai, C., & Mazzoni, G. (2021). Smartphone addiction across the lifetime during Italian lockdown for COVID-19. *Journal of Addictive Diseases, 39*, 441-449. https://doi.org/10.1080/10550887.2021.1889751

Catone, G., Senese, V., Pisano, S., Siciliano, M., Russo, K., Muratori, P., Marotta, R., Pascotto, A., & Broome, M. (2020). The drawbacks of information and communication technologies: Interplay and psychopathological risk of nomophobia and cyber-bullying, results from the bullying and youth mental health Naples study (BYMHNS). *Computers in Human Behavior, 113*, Article e106496. https://doi.org/10.1016/j.chb.2020.106496

Celik, Y., & Atilla, G. (2018). Investigation of the relationship between the nomophobia, difficulties in emotion regulation and academic achievements of the university students: A study on Manavgat vocational school. *International Journal of Social Humanities Sciences Research, 5*, 2628-2639. https://doi.org/10.26450/jshsr.674

Christensen, T., Barrett, L., Bliss-Moreau, E., Lebo, K., & Kaschub, C. (2003). A practical guide to experience-sampling procedures. *Journal of Happiness Studies, 4*(1), 53-78. https://doi.org/10.1023/A:1023609306024

Cohen, A., & Lemish, D. (2003). Real time and recall measures of mobile phone use: Some methodological concerns and empirical applications. *New Media & Society, 5*(2), 167-183. https://doi.org/10.1177/1461444803005002002

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences.* Lawrence Earlbaum Associates.

Colasante, T., Lin, L., De France, K., & Hollenstein, T. (2022). Any time and place? Digital emotional support for digital natives. *The American Psychologist, 77*, 186–195. https://doi.org/10.1037/amp0000708

Colombo, D., Fernández-Álvarez, J., Suso-Ribera, C., Cipresso, P., Valev, H., Leufkens, T., Sas, C., Garcia-Palacios, A., Riva, G., & Botella, C. (2020). The need for change: Understanding emotion regulation antecedents and consequences using ecological momentary assessment. *Emotion, 20*(1), 30-36. https://doi.org/10.1037/emo0000671.

Conner, T., Barrett, L., Tugade, M., & Tennen, H. (2007). Idiographic personality: The theory and practice of experience sampling. In R. Robins, R. Fraley, & R. Krueger (Eds.), *Handbook of research methods in personality psychology* (pp. 79-96). The Guilford Press.

Consolvo, S., & Walker, M. (2003). Using the experience sampling method to evaluate ubicomp applications. *Pervasive Computing, IEEE, 2*(2), 24-31. https://doi.org/10.1109/MPRV.2003.1203750

Creswell, J. (2017). Mindfulness interventions. *Annual Review of Psychology, 68*, 491-516. https://doi.org/10.1146/annurev-psych-042716-051139

Daros, A., Daniel, K., Meyer, M., Chow, P., Barnes, L., & Teachman, B. (2019). Impact of social anxiety and social context on college students' emotion regulation strategy use: An experience sampling study. *Motivation and Emotion, 43*(5), 844-855. https://doi.org/10.1007/s11031-019-09773-x

Delavarpour, M., Bahar, M., & Ghods, F. (2019). Predicting nomophobia according to mood status and anxiety sensitivity: Analyzing the moderating role of gender. *Journal of Clinical Psychology, 11*(2), 52-66. https://doi.org/10.22075/jcp.2019.18281.1707

Deng, T., Kanthawala, S., Meng, J., Peng, W., Kononova, A., Hao, Q., Zhang, Q., & David, P. (2018). Measuring smartphone usage and task switching with log tracking and self-reports. *Mobile Media & Communication, 7*(1), 3-23. https://doi.org/10.1177/2050157918761491

Devi, U., & Dutta, R. (2022). A review paper on prevalence of nomophobia among students and its impact on their academic achievement. *Journal of Positive School Psychology, 6*(3), 5397-5405.

Durak, H. (2019). Investigation of nomophobia and smartphone addiction predictors among adolescents in Turkey: Demographic variables and academic performance. *The Social Science Journal, 56*(4), 492-517. https://doi.org/10.1016/j.soscij.2018.09.003

Elhai, J., Levine, J., & Hall, B. (2019). The relationship between anxiety symptom severity and problematic smartphone use: A review of the literature and conceptual frameworks. *Journal of Anxiety Disorders, 62*, 45-52. https://doi.org/10.1016/j.janxdis.2018.11.005

Enez, Ö. (2021). *The phobia of the modern world: Nomophobia conceptualization of nomophobia and investigation of associated psychological constructs*. E-kitap Projesi.

Erdem, H., Turen, U., & Kalkin, G. (2017). Mobil telefon yoksunluğu korkusu (nomofobi) yayılımı: Türkiye'den üniversite öğrencileri ve kamu çalışanları örneklemi [No mobile phone phobia (nomophobia) prevalence: Samples of undergraduate students and public employees from Turkey]. *Journal of Information Technologies, 10*(1), 1-12. https://doi.org/10.17671/btd.30223

Farmer, R., & Sundberg, N. (1986). Boredom proneness-the development and correlates of a new scale. *Journal of Personality Assessment, 50*, 4-17. https://doi.org/10.1207/s15327752jpa5001_2

Fidancı, İ., Aksoy, H., Yengil Taci, D., Ayhan Başer, D., & Cankurtaran, M. (2021). Effect of Covid-19 restrictions on nomophobia and smartphone addiction levels. *Bağımlılık Dergisi, 22*, 395-402. https://doi.org/10.51982/bagimli.911501

Gable, S., Reis, H., Impett, E., & Asher, E. (2004). What do you do when things go right? The intrapersonal and interpersonal benefits of sharing positive events. *Journal of Personality and Social Psychology, 87*(2), 228-245. https://doi.org/10.1037/0022-3514.87.2.228

Gana, K., Broc, G., & Bailly, N. (2019). Does the Boredom proneness scale capture traitness of boredom? Results from a six-year longitudinal trait-state-occasion model. *Personality and Individual Differences, 139*, 247-253. https://doi.org/10.1016/j.paid.2018.11.030

Gencoz, T. (2000). Positive and negative affect shedule: A study of validity and reliability. *Turkish Journal of Psychology, 15*, 19-28. Retrieved from: https://psycnet.apa.org/record/2001-17472-002

Gratz, K., & 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

Gray, E., & Watson, D. (2007). Assessing positive and negative affect via self-report. In J. Coan & J. Allen (Eds.), *Handbook of emotion elicitation and assessment* (pp. 171-183). Oxford University Press.

Greenberg, L. (2004). Emotion–focused therapy. *Clinical Psychology and Psychotherapy, 11*, 3-16. https://doi.org/10.1002/cpp.388

Hoffner, C., & Lee, S. (2015). Mobile phone use, emotion regulation, and well-being. *Cyberpsychology, Behavior, and Social Networking, 18*, 411-416.

Jahrami, H., Fekih Romdhane, F., Pandi-Perumal, S., BaHammam, A., & Vitiello, M. (2023). Global research evidence on nomophobia during 2008-2022: A bibliometric analysis and review. *Psychology, Health & Medicine, 29*(5), 889-904.https://doi.org/10.1080/13548506.2023.2268888

Kanjo, E., Kuss, D., & Ang, C. (2017). Notimind: Utilizing responses to smart phone notifications as affective sensors. *IEEE Access, 5*, 22023-22035. https://doi.org/10.1109/ACCESS.2017.2755661

Kardefelt-Winther, D. (2014). A conceptual and methodological critique of internet addiction research: Towards a model of compensatory internet use. *Computers in Human Behavior, 31*, 351-354. https://doi.org/10.1016/j.chb.2013.10.059

Katz, J., Lever, K., & Chen, Y. (2008). Mobile music as environmental control and prosocial entertainment. In J. Katz (Ed.), *Handbook of mobile communication studies* (pp. 367-376). MIT Press.

Kenny, R., Dooley, B., & Fitzgerald, A. (2016). Ecological momentary assessment of adolescent problems, coping efficacy, and mood states using a mobile phone app: An exploratory study. *JMIR Mental Health, 3*(4), Article e51. https://doi.org/10.2196/mental.6361

King, A., Valenca, A., & Nardi, A. (2010). Nomophobia: The mobile phone in panic disorder with agoraphobia: Reducing phobias or worsening of dependence? *Cognitive and Behavioral Neurology, 23*, 52-54. https://doi.org/10.1097/WNN.0b013e3181b7eabc

Koc, E., Eksi, H., & Demirci, I. (2018). The psychometric properties of the Turkish form of Boredom Proneness Scale-Short Form (BPS-SR). *Proceedings of the 1st International Congress on Seeking New Perspectives in Education, 1*, 217-219. Retrieved from: https://toad.halileksi.net/olcek/kisa-can-sikintisi-egilimi-olcegi-2/

Ku, Y., Chu, T., & Tseng, C. (2013). Gratifications for using CMC technologies: A comparison among SNS, IM, and e-mail. *Computers in Human Behavior, 29*(1), 226-234. https://doi.org/10.1016/j.chb.2012.08.009

Kuss, D., Kanjo, E., Crook-Rumsey, M., Kibowski, F., Wang, G., & Sumich, A. (2018). Problematic mobile phone use and addiction across generations: The roles of psychopathological symptoms and smartphone use. *Journal of Technology in Behavioral Science, 3*, 141-149. https://doi.org/10.1007/s41347-017-0041-3

Kwok, O., Underhill, A., Berry, J., Luo, W., Elliott, T., & Yoon, M. (2008). Analyzing longitudinal data with multilevel models: An example with individuals living with lower extremity intra-articular fractures. *Rehabilitation Psychology, 53*(3), 370-386. https://doi.org/10.1037/a0012765

Lavender, J., Tull, M., DiLillo, D., Messman-Moore, T., & Gratz, K. L. (2017). Development and validation of a state-based measure of emotion dysregulation. *Assessment, 24*, 197-209. https://doi.org/10.1177/1073191115601218

Leung, L., & Wei, R. (2000). More than just talk on the move: Uses and gratifications of the cellular phone. *Journalism & Mass Communication Quarterly, 77*, 308-320. https://doi.org/10.1177/107769900007700206

Lukoff, K., Yu, C., Kientz, J., & Hiniker, A. (2018). What makes smartphone use meaningful or meaningless? *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies, 2*(1), 1-22. https://doi.org/10.1145/3191754

Mercer-Lynn, K., Bar, R., & Eastwood, J. (2014). Causes of boredom: The person, the situation, or both? *Personality and Individual Differences, 56*, 122-126. https://doi.org/10.1016/j.paid.2013.08.034

Mikulas, W., & Vodanovich, S. (1993). The essence of boredom. *The Psychological Record, 43*, 3-12. Retrieved from: https://psycnet.apa.org/record/1993-28333-001

Mneimne, M., Dashineau, S., & Yoon, K. L. (2019). Mindfulness and negative affectivity in real time: a within-person process model. *Cognition and Emotion, 33*(8), 1687–1701. https://doi.org/10.1080/02699931.2019.1597684

Myin-Germeys, I., Kasanova, Z., Vaessen, T., Vachon, H., Kirtley, O., Viechtbauer, W., & Reininghau, U. (2018). Experience sampling methodology in mental health research: New insights and technical developments. *World Psychiatry, 17*(2), 123-132. https://doi.org/10.1002/wps.20513

Myin-Germeys, I., Oorschot, M., Collip, D., Latester, J., Delespaul, P., & van Os, J. (2009). Experience sampling research in psychopathology: Opening the black box of daily life. *Psychological Medicine, 39*, 1533-1547. https://doi.org/10.1017/S0033291708004947

Nett, U., Goetz, T., & Hall, N. (2011). Coping with boredom in school: An experience sampling perspective. *Contemporary Educational Psychology, 36*(1), 49-59. https://doi.org/10.1016/j.cedpsych.2010.10.003

Nezlek, J. (2007). A multilevel framework for understanding relationships among traits, states, situations and behaviours. *European Journal of Personality, 21*(6), 789-810. https://doi.org/10.1002/per.640

Nezlek, J. (2020). Diary studies in social and personality psychology: An introduction with some recommendations and suggestions. *Social Psychological Bulletin, 15*, Article e2679. https://doi.org/10.32872/spb.2679

Noë, B., Turner, L., Linden, D., Allen, S., Maio, G., & Whitaker, R. (2017). Timing rather than user traits mediates mood sampling on smartphones. *BMC Research Notes, 10*(1), 481. https://doi.org/10.1186/s13104-017-2808-1

Oliveira Carvalho, P., Hülsdünker, T., & Carson, F. (2022). The impact of the COVID-19 lockdown on European students' negative emotional symptoms: A Systematic review and meta-analysis. *Behavioral Sciences, 12*(1), 3. https://doi.org/10.3390/bs12010003

Ozturk, E., & Cosanay, B. (2020). Okul öncesi öğretmen adaylarının can sıkıntısı eğilimleri ile mobil telefon yoksunlukları arasındaki ilişki [The relationship between boredom of preschool teacher candidates and mobile phone deprivations]. *The Journal of International Social Research, 13*, 711-720. https://doi.org/10.17719/jisr.2020.4128

Pielot, M., Cardoso, B., Katevas, K., Serrà, J., Matic, A., & Oliver, N. (2017). Beyond interruptibility: Predicting opportune moments to engage mobile phone users. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies, 1*(3), 1-25. https://doi.org/10.1145/3130956

Pielot, M., Church, K., & de Oliveira, R. (2014). An in-situ study of mobile phone notifications. *Proceedings Of The 16th International Conference on Human-Computer Interaction with Mobile Devices and Services* in (p. 233-242). Toronto, Canada: Association for Computing Machinery. https://doi.org/10.1145/2628363.2628364

Pielot, M., Dingler, T., Pedro, J., & Oliver, N. (2015). When attention is not scarce - detecting boredom from mobile phone usage. *Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing* (pp. 825-836). Association for Computing Machinery. https://doi.org/10.1145/2750858.2804252

Quigley, L., & Dobson, K. (2017). Behavioral activation treatments for depression. In G. Hofmann & G. Asmundson (Eds.), *The science of cognitive behavioral therapy* (pp. 291-318). Academic Press.

Raudenbush, S., & Bryk, A. (2002). *Hierarchical linear models: Applications and data analysis methods.* SAGE.

Raudenbush, S., Bryk, A., Cheong, Y., Congdon, R., & Toit, M. (2019). *HLM 8 hierarchical linear and nonlinear modeling.* Scientific Software International Inc.

Reeve, J. (2018). *Understanding motivation and emotion*. Wiley.

Regan, T., Harris, B., Van Loon, M., Nanavaty, N., Schueler, J., Engler, S., & Fields, S. (2020). Does mindfulness reduce the effects of risk factors for problematic smartphone use? Comparing frequency of use versus self-reported addiction. *Addictive Behaviors, 108*, Article e106435. https://doi.org/10.1016/j.addbeh.2020.106435

Rodríguez, M., Lozano, J., Linares Mingorance, P., & Pérez-Mármol, J. (2020). Influence of smartphone use on emotional, cognitive and educational dimensions in university students. *Sustainability, 12*(16), 6646. https://doi.org/10.3390/su12166646

Ruganci, R., & Gencoz, T. (2010). Psychometric properties of a Turkish version of the Difficulties in Emotion Regulation Scale. *Journal of Clinical Psychology, 66*, 442-455. https://doi.org/10.1002/jclp.20665

Sahin, N. H., & Durak, A. (1994). Kısa semptom envanteri: Türk gençleri için uyarlanması [A study of the Brief symptom inventory in Turkish youth]. *Turkish Journal of Psychology, 9*, 44-56. Retrieved from: https://toad.halileksi.net/wp-content/uploads/2022/07/kisa-semptom-envanteri-kse-toad.pdf

Shwetak, N., Julie, A., Gillian, R., Sooraj, B., & Gregory, D. (2006). Farther than you may think: An empirical investigation of the proximity of users to their mobile phones. In P. Dourish & A. Friday (Eds), *Proceedings of the UbiComp 2006: Ubiquitous Computing* (pp.123-140). Springer. https://doi.org/10.1007/11853565_8

Struk, A., Scholer, A., & Danckert, J. (2016). A self-regulatory approach to understanding boredom proneness. *Cognition and Emotion, 30*, 1388-1401. https://doi.org/10.1080/02699931.2015.1064363

Tabachnick, B., & Fidell, L. (2007). *Using multivariate statistics* (5th ed.). Allyn & Bacon/Pearson Education.

Thompson, R. (2019). Emotion dysregulation: A theme in search of definition. *Development and Psychopathology, 31*, 805-815. https://doi.org/10.1017/S0954579419000282

Todman, M. (2013). The dimensions of state boredom frequency duration unpleasantness consequences and causal attributions. *International Journal of Educational Research, 1*(1), 32-40. Retrieved from: http://www.erint.savap.org.pk/PDF/Vol.1(1)/ERInt.2013(1.1-02).pdf

Verduyn, P., Lee, D., Park, J., Shablack, H., Orvell, A., Bayer, J., Ybarra, O., Jonides, J., & Kross, E. (2015). Passive Facebook usage undermines affective well-being: Experimental and longitudinal evidence. *Journal of Experimental Psychology: General, 144*(2), 480-488. https://doi.org/10.1037/xge0000057

Villanueva, J., Meyer, A., Miché, M., Wersebe, H., Mikoteit, T., Hoyer, J., Imboden, C., Bader, K., Hatzinger, M., Lieb, R., & Gloster, A. T. (2020). Social interaction in major depressive disorder, social phobia, and controls: The importance of affect. *Journal of Technology in Behavioral Science, 5*(2), 139-148. https://doi.org/10.1007/s41347-019-00121-x

Wegmann, E., Ostendorf, S., & Brand, M. (2018). Is it beneficial to use internet-communication for escaping from boredom? Boredom proneness interacts with cue-induced craving and avoidance expectancies in explaining symptoms of internet-communication disorder. *PloS One, 13*, 1-18. https://doi.org/10.1371/journal.pone.0195742

Weiss, N., Gratz, K., & Lavender, J. (2015). Factor structure and initial validation of a multidimensional measure of difficulties in the regulation of positive emotions: The DERS-positive. *Behavior Modification, 39*(3), 431-453. https://doi.org/10.1177/0145445514566504

Yildirim, C. (2014). *Exploring the dimensions of nomophobia: Developing and validating a questionnaire using mixed methods research* [Master's thesis, Iowa State University]. https://core.ac.uk/download/pdf/38926087.pdf

Yildirim, C., & Correia, A. (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

Yildirim, C., Sumuer, E., Adnan, M., & Yildirim, S. (2016). A growing fear: Prevalence of nomophobia among Turkish college students. *Information Development, 32*, 1322- 1331. https://doi.org/10.1177/0266666915599025

Zhao, J., Ye, B., & Yu, L. (2021) Peer phubbing and chinese college students' smartphone addiction during Covid-19 pandemic: The mediating role of boredom proneness and the moderating role of refusal self-efficacy. *Psychology Research and Behavior Management, 14*, 1725-1736. https://doi.org/10.2147/PRBM.S335407

Zwilling, M. (2022). The impact of nomophobia, stress, and loneliness on smartphone addiction among young adults during and after the Covid-19 pandemic: An Israeli case analysis. *Sustainability, 14*, 3229. https://doi.org/10.3390/su14063229

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## Appendix 1
## ESM Questionnaire

PIEL Survey akıllı telefon uygulaması üzerinden dolduracağınız bu anket; akıllı telefon kullanımınız, duygularınız ve sosyal ortamınıza ilişkin 10 sorudan oluşmaktadır. Anket sorularının size iletildiği andan itibaren 10 dakika içinde cevaplandırılması gerekmektedir. Sorular telefon ekranınıza sırayla gelecektir. Soruların doğru veya yanlış cevapları yoktur. Soruların altında yer alan cevap seçeneklerinden size en uygun ifadeyi işaretlemeniz gerekmektedir. Lütfen her bir soruyu son 2 saati dikkate alarak cevaplandırınız.

1. Son anketten itibaren ailenizin ve/veya arkadaşlarınızın size telefon aracılığıyla ulaşamamalarından endişelendiniz mi?

Çok az veya hiç   Biraz   Kısmen   Fazla   Çok fazla

2. Son anketten itibaren telefonunuzu kullanamadığınız için rahatsızlık hissettiniz mi?

Çok az veya hiç   Biraz   Kısmen   Fazla   Çok fazla

3. Son anketten itibaren telefonunuzun çektiğini ve/veya internet bağlantısının olduğunu sıklıkla olarak kontrol ettiniz mi?

Çok az veya hiç   Biraz   Kısmen   Fazla   Çok fazla

4. Son anketten itibaren arama, mesaj, bildirim ve e-postalarınızı kontrol edemediğiniz için kendinizi huzursuz hissettiniz mi?

Çok az veya hiç   Biraz   Kısmen   Fazla   Çok fazla

5. Son anketten itibaren hissettiğiniz duygunun hangi duygu olduğunu anlamada güçlük çektiniz mi?

Çok az veya hiç   Biraz   Kısmen   Fazla   Çok fazla

6. Son anketten itibaren olumlu veya olumsuz duygularınızı kontrol etmekte zorlandınız mı?

Çok az veya hiç   Biraz   Kısmen   Fazla   Çok fazla

7. Son anketten itibaren hissettiğiniz olumlu duyguların derecesini aşağıdaki ölçekte işaretleyiniz.

Çok az veya hiç   Biraz   Kısmen   Fazla   Çok fazla

8. Son anketten itibaren hissettiğiniz olumsuz duyguların derecesini aşağıdaki ölçekte işaretleyiniz.

Çok az veya hiç   Biraz   Kısmen   Fazla   Çok fazla

9. Son anketten itibaren hissettiğiniz can sıkıntısı düzeyini aşağıdaki ölçekte işaretleyiniz.

Çok az veya hiç Biraz Kısmen Fazla Çok fazla

10. Şu anda içinde bulunduğunuz durumdan/ortamdan memnuniyet dereceniz nedir?

Hiç memnun değilim Memnun değilim Kararsızım Memnunum Çok memnunum

## Appendix 2
## Pilot Study ESM Questionnaire

PIEL Survey akıllı telefon uygulaması üzerinden dolduracağınız bu anket; akıllı telefon kullanımınız, duygularınız ve sosyal ortamınıza ilişkin 10 sorudan oluşmaktadır. Anket sorularının size iletildiği andan itibaren 10 dakika içinde cevaplandırılması gerekmektedir. Sorular telefon ekranınıza sırayla gelecektir. Soruların doğru veya yanlış cevapları yoktur. Soruların altında yer alan cevap seçeneklerinden size en uygun ifadeyi işaretlemeniz gerekmektedir. Lütfen her bir soruyu son 2 saati dikkate alarak cevaplandırınız.

1. Son anketten itibaren ailenizin ve/veya arkadaşlarınızın size telefon aracılığıyla ulaşamamalarından endişelendiniz mi?

Çok az veya hiç    Biraz    Kısmen    Fazla    Çok fazla

2. Son anketten itibaren telefonunuzu kullanamadığınız için rahatsızlık hissettiniz mi?

Çok az veya hiç    Biraz    Kısmen    Fazla    Çok fazla

3. Son anketten itibaren telefonunuzun çektiğini ve/veya internet bağlantısının olduğunu sıklıkla olarak kontrol ettiniz mi?

Evet    Hayır

4. Son anketten itibaren telefonunuzu kontrol edemediğiniz için huzursuz hissettiniz mi?

Çok az veya hiç    Biraz    Kısmen    Fazla    Çok fazla

5. Son anketten itibaren hangi duyguyu hissettiğinizi anlamada güçlük çektiniz mi?

Çok az veya hiç    Biraz    Kısmen    Fazla    Çok fazla

6. Son anketten itibaren olumlu/ olumsuz duygularınızı kontrol etmekte zorlandınız mı?

Çok az veya hiç    Biraz    Kısmen    Fazla    Çok fazla

7. Şu anda hissettiğiniz olumlu duyguların derecesini aşağıdaki ölçekte işaretleyiniz.

Çok az veya hiç    Biraz    Kısmen    Fazla    Çok fazla

8. Şu anda hissettiğiniz olumsuz duyguların derecesini aşağıdaki ölçekte işaretleyiniz.

Çok az veya hiç    Biraz    Kısmen    Fazla    Çok fazla

9. Şu anda hissettiğiniz can sıkıntısı düzeyi nedir?

Çok az veya hiç    Biraz    Kısmen    Fazla    Çok fazla

10. Şu anda içinde bulunduğunuz durumdan/ortamdan memnuniyet dereceniz nedir?

Hiç memnun değilim     Memnun değilim     Kararsızım     Memnunum     Çok memnunum

## Appendix 3

*One-Way Analyses of Variance Test of the Study Variables According to The Group*

| | Non-nomophobia group | | Nomophobia group | | $F$ (1,40) | $\eta^2$ |
|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | | |
| Trait measures | | | | | | |
| Trait nomophobia | 2.17 | .64 | 5.87 | .31 | 569.85*** | .93 |
| Trait EDR | 2.10 | .48 | 2.67 | .69 | 9.67** | .20 |
| Trait PA | 3.40 | .41 | 3.39 | .62 | .01 | .00 |
| Trait NA | 2.13 | .73 | 2.38 | .52 | 1.55 | .04 |
| BP | 2.77 | 1.16 | 3.61 | 1.37 | 4.53* | .10 |
| ESM measures | | | | | | |
| Daily nomophobia | 4.99 | 1.27 | 9.55 | 3.34 | 240.25*** | .45 |
| Daily EDR | 2.71 | .84 | 4.55 | 1.69 | 139.97*** | .32 |
| Daily PA | 2.76 | .93 | 2.96 | .79 | 3.99* | .01 |
| Daily NA | 1.83 | .84 | 2.60 | .83 | 63.47*** | .18 |
| Daily boredom | 1.78 | .72 | 2.85 | .95 | 117.84*** | .29 |
| Daily SC | 3.79 | .74 | 3.37 | .71 | 24.85*** | .08 |

*Note*. ***$p < .001$, **$p < .01$* $p < .05$, *M*= Mean, *SD*= Standard deviation, EDR= Emotion dysregulation, PA= Positive affect, NA= Negative affect, BP= Boredom proneness, ESM= Experience sampling method, SC= Social context.