

EXAMINING THE RELATIONSHIP BETWEEN PERSONALITY TRAITS AND
NOMOPHOBIA AMONG PRESERVICE TEACHERS

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
COMPUTER EDUCATION AND INSTRUCTIONAL TECHNOLOGY

SEPTEMBER 2019

Approval of the thesis:

**EXAMINING THE RELATIONSHIP BETWEEN PERSONALITY TRAITS
AND NOMOPHOBIA AMONG PRESERVICE TEACHERS**

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ABSTRACT

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September 2019, 55 pages

In the last decade, the uptake of mobile information and communication technologies, especially smartphones, has undoubtedly had a substantial impact on how people communicate, work, learn, entertain, and even live. While smartphones have obvious benefits due to the capabilities they provide, such as instant access to information and constant connectivity to family and friends, problems associated with smartphones constitute a growing concern for end users, parents, teachers, experts, and researchers. One such problem that has recently become popular is nomophobia, which refers to the fear of being unable to use one's smartphone and to utilize its capabilities. Although research into nomophobia has rapidly grown over the last five years, little is known about the factors contributing to nomophobia, especially among preservice teachers. Therefore, the current study investigated the prevalence and personality-related predictors of nomophobia among preservice teachers in Turkey. The current study collected data from 458 preservice teachers regarding their nomophobia levels, demographic characteristics, and personality traits. Results indicated that nomophobia was a prevalent issue among the preservice teachers in the sample, with 55% of the preservice teachers demonstrating moderate levels of nomophobia and 22.5% demonstrating severe levels of nomophobia. Results also indicated that female

preservice teachers were more nomophobic than male preservice teachers. However, there was no age-related differences in nomophobia levels. In relation to personality-related predictors of nomophobia, extraversion and agreeableness were the only personality traits that were significant predictors of preservice teachers' nomophobia levels, with extraversion being a positive predictor and agreeableness being a negative predictor.

Keywords: Nomophobia, Personality Traits, Preservice Teachers, Smartphones

ÖZ

ÖĞRETMEN ADAYLARI ARASINDA KİŞİLİK ÖZELLİKLERİ İLE NOMOFOBİ ARASINDAKİ İLİŞKİNİN İNCELENMESİ

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Eylül 2019, 55 sayfa

Son on yılda, mobil bilgi ve iletişim teknolojilerinin, özellikle akıllı telefonların, hayatın içine girmesi, kuşkusuz insanların iletişimleri, çalışmaları, öğrenmeleri, eğlenmeleri ve hatta yaşamları üzerinde önemli bir etkiye sahiptir. Akıllı telefonlar, bilgiye anında erişim ve aileye ve arkadaşlara sürekli bağlantı gibi sağladığı çeşitli kolaylıklardan dolayı sahip olduğu bariz faydalara rağmen, akıllı telefonlarla ilgili sorunlar son kullanıcılar, ebeveynler, öğretmenler, uzmanlar ve araştırmacılar için artan bir endişe kaynağı olmaktadır. Son zamanlarda yaygın medyada ve akademik çevrelerde popüler olan bu tür problemlerden biri, kişinin akıllı telefonunu ve sağladığı kolaylıkları kullanamama korkusu anlamına gelen nomofobidir. Her ne kadar nomofobiye yönelik araştırmalar son beş yılda hızla artmış olsa da, özellikle öğretmen adayları arasında, nomofobiye katkı sağlayan faktörler hakkında çok az şey bilinmektedir. Bu nedenle, bu tez çalışması Türkiye'de öğretmen adayları arasında nomofobinin yaygınlığı ve kişiliğe bağlı yordayıcılarını araştırmıştır. Çalışma kapsamında 458 öğretmen adayından nomofobi düzeyleri, demografik özellikleri ve kişilik özellikleri ile ilgili veriler toplandı. Sonuçlar, örneklemdaki öğretmen adaylarının %55'inde orta dereceli nomofobi ve %22,5'inde şiddetli nomofobi düzeyi ile nomofobinin öğretmen adayları arasında yaygın bir sorun olduğunu göstermiştir.

Sonuçlar ayrıca, kadın öğretmen adaylarının erkek öğretmen adaylarından daha nomofobik olduğunu göstermiştir. Ancak, nomofobi düzeylerinde yaşa bağlı hiçbir fark görülmemiştir. Nomofobinin kişiliğe bağlı yordayıcıları konusunda, dışa dönüklük pozitif ve yumuşak başlılık negatif olmak üzere, dışa dönüklük ve yumuşak başlılık öğretmen adaylarının nomofobi seviyelerinin önemli yordayıcıları olarak bulunan tek kişilik özellikleridir.

Anahtar Kelimeler: Nomofobi, Kişilik Özellikleri, Öğretmen Adayları, Akıllı Telefonlar

To My Family...

ACKNOWLEDGEMENTS

I would like to express my deep gratitude to my thesis advisor Prof. Dr. Soner Yıldırım for his unwavering support and guidance since my undergraduate years and throughout what turned out to be a long graduate studies journey. I feel honored to be one of his graduate students.

I also would like to acknowledge and thank my co-advisor Dr. Ömer Faruk İslim for his guidance throughout my thesis study and for his tremendous help with data collection. In addition, I would like to thank my thesis committee members, Dr. Halil Ersoy and Dr. Göknur Kaplan for their time and contributions to my thesis.

Lastly, I would like to thank my family for their unconditional love, support, and encouragement throughout my graduate studies. I had to spend a great deal of time away from them to work on the thesis, for which I deeply appreciate their understanding.

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LIST OF ABBREVIATIONS

ABBREVIATIONS

NMP-Q: Nomophobia Questionnaire

ICTs: Information and Communication Technologies

FFM: Five-Factor Model

FFT: Five-Factor Theory

CEIT: Computer Education and Instructional Technology

PCG: Psychological Counseling and Guidance

CHAPTER 1

INTRODUCTION

This chapter provides an introduction to the current study by giving some background information about the study, stating the problem being addressed within the scope of the study, describing the purpose of the study, and highlighting the significance of the problem. The chapter concludes by identifying the assumptions made throughout the study and listing the definition of key terms.

1.1. Background of the Study

The rapid developments in mobile computing have expedited the proliferation and adoption of mobile information and communication technologies (ICTs). Of all these mobile ICTs, mobile phones and smartphones have infiltrated into every aspect of our daily lives. By 2025, the number of unique mobile subscriptions is projected to reach 5.9 billion (GSMA, 2018a). In a recent Mobile Economy Report, GSMA Association (2018b) reports that smartphone ownership rate in Turkey is 79% and is estimated to reach 87% by 2025. Considering global trends (GSMA, 2018a, Pew Research Center, 2019), it is safe to assume that smartphones are commonly adopted by young adults around the world and in Turkey.

Although mobile phones in general and smartphones in particular have obvious benefits in terms of communication, information retrieval, entertainment, and so on, smartphones have been shown to result in compulsive usage checking habits (Oulasvirta et al., 2012; Lee, Chang, Lin, & Cheng, 2014) an increase in distress (Matusik & Mickel, 2011) and addictive use behaviors (Chiu, 2014; Lee et al., 2014; Salehan & Negahban, 2013). Another problem that has recently introduced to our lives with smartphones been is nomophobia (Yildirim & Correia, 2015; Yildirim, Sumuer, Adnan, & Yildirim, 2016). Nomophobia, which stands for no mobile-phone-phobia,

is defined as “the fear of being out of mobile phone contact” (SecurEnvoy, 2012, para. 1). Commonly described as a modern age phobia, nomophobia refers to the intense feeling of anxiety or discomfort when one is unable to use their smartphone or utilize the services it offers (Yildirim & Correia, 2015).

While there are a few research studies investigating nomophobia among college students (Adnan & Gezgin, 2016; Gezgin, Şahin, & Yıldırım, 2017; Yıldırım & Correia, 2015; Yıldırım et al., 2016;), little is known about what personality traits may account for young adults’ predisposition to nomophobia (Yıldırım & Correia, 2015; e.g. Yoğurtçu, 2018). In addition, several studies have been conducted among adolescents (Gezgin & Çakır, 2016; Gezgin, Çakır, & Yıldırım, 2018), various young adult groups (Akıllı & Gezgin, 2016; Sırakaya, 2018), nursing students (Ayar, Gerçekler, Özdemir, & Bektas, 2018), and teachers (Dağlı, Gezgin, Hamutoğlu, & Sezen-Gültekin, 2017) in Turkey. Yet, there is a scarcity of research studies examining the prevalence of nomophobia among Turkish preservice teachers (Gezgin, Şumuer, Arslan, & Yıldırım, 2017).

1.2. Statement of the Problem

Given the growing number of problems associated with mobile phones, it is essential that behavioral and psychological mechanisms underlying nomophobia be explored (Bianchi & Phillips, 2005; Hong, Chiu, & Der-Hsiang, 2012), because understanding these factors and their comorbidity with nomophobia can assist in identifying the risk groups predisposed to exhibiting nomophobic behaviors (Walsh, White, Cox & Young, 2011) and developing intervention programs for those groups (Pourrazavi, Allahverdipour, Jafarabadi & Matlabi, 2014). This is especially important for preservice teachers who are the teachers of tomorrow and will be serving as role models for future generations. Accordingly, this study was designed to investigate the personality-related predictors of nomophobia among preservice teachers.

1.3. Purpose of the Study

Drawing upon the literature on problematic use of mobile phones, the purpose of this study was to examine the prevalence and severity of nomophobia among preservice teachers in Turkey and investigate whether and which personality traits may predict the severity of nomophobia among preservice teachers in Turkey.

The following are the research questions that guided the current study:

1. What is the prevalence of nomophobia among Turkish preservice teachers?
2. In what ways, if at all, do preservice teachers differ in their nomophobia levels?
3. To what extent do personality traits predict the nomophobia levels of preservice teachers?

1.4. Significance of the Study

The main importance of investigating nomophobia levels of preservice teachers is that they are the teachers of tomorrow who are going to educate and serve as role models for future generations. Undeniably, students have a tendency to look up to their teachers, and if they observe their teachers being overdependent on their smartphones and displaying nomophobic behaviors, it is very easy for them to adopt such problematic behaviors at early ages. Therefore, it is of great importance to better understand the prevalence and severity of nomophobia among preservice teachers, based on which appropriate intervention strategies could be developed. The current study, hence, seeks to contribute to the existing nomophobia literature by shedding light on the nomophobia levels of preservice teachers in Turkey with respect to various demographic factors, including gender, age, major, year of study, and duration of smartphone ownership and on the personality-related predictors of nomophobia among Turkish preservice teachers.

1.5. Assumptions

The following assumptions were made in this study:

- Participants completed the questionnaire truthfully and accurately.
- The self-reported questionnaires administered to the participants yield reliable and valid measurements of the underlying constructs.
- The paper-based questionnaires have been accurately entered into the statistical software package.
- The sample recruited for this study fairly represents the preservice teachers population in Turkey.

1.6. Definition of Terms

The following are the key terms used throughout this study.

Nomophobia: The fear of not being able to use a smartphone or a mobile phone and/or the services it offers. (Yildirim & Correia, 2015)

Personality traits: Personality is a multidimensional construct organized hierarchically from narrow to broad traits, including extraversion, agreeableness, conscientiousness, neuroticism, and openness-to-experience (McCrae & Costa, 2008).

Extraversion: Extraversion encompasses dispositions associated with being warm, gregarious, assertive, sensation-seeking and having positive emotions (Anastasi & Urbina, 1997).

Agreeableness: The characteristics that represent agreeableness include trust, straightforwardness, altruism, compliance, modesty and tender-mindedness (Anastasi & Urbina, 1997).

Conscientiousness: Conscientiousness is the dimension of personality that is related to competence, achievement, self-discipline and dutifulness (Anastasi & Urbina, 1997).

Neuroticism: Neuroticism pertains to the fluctuations in emotions and is associated with such dispositions as anxiety, impulsiveness and self-consciousness (Anastasi & Urbina, 1997).

Openness-to-experience: The characteristics associated with openness-to-experience involve intellectual curiosity, inquisitiveness, aesthetic sensitivity, alertness to feelings and imagination (Costa and McCrae, 1992).

1.7. Thesis Outline

The outline of the rest of the thesis is as follows: Chapter 2 provides a review and synthesis of the relevant literature on the definition, prevalence, and predictors of nomophobia, highlighting the need for the current study. Chapter 3 provides a detailed description of the methodology followed throughout the entire study, from conceptualization to data collection and analysis. Chapter 4 provides the results of descriptive and inferential statistical tests conducted to analyze the data and to answer the research questions that guided the current study. Lastly, Chapter 5 provides a discussion of the findings from the current study in relation to the literature and highlights some directions for future research.

CHAPTER 2

LITERATURE REVIEW

This chapter provides a review of the relevant literature based on which the current study was conceptualized. It starts with a discussion of nomophobia, how it is measured, and its prevalence in the society. Then the chapter dives into the predictors of nomophobia, with a particular focus on demographic factors and personality-related factors. In so doing, this chapter synthesizes the prior work on the main topic of the thesis and highlights the need for investigating the prevalence and predictors of nomophobia. The chapter concludes with a summary of the relevant literature.

2.1. ICTs and Preservice Teachers in Turkey

Over the last decade, Turkey has witnessed a rapid increase in the adoption of various ICTs by its citizens. One remarkable example of the increasing proliferation of ICTs in Turkey is the staggering increase in Internet penetration rates in Turkey over the last decade. Back in 2009, 38.1% of the Turkish population were Internet users (TUIK, 2019). As of 2019, the Internet penetration rate in Turkey was 75.3% (TUIK, 2019). The Internet, among other ICTs, is commonly and frequently used by preservice teachers in Turkey as well. For instance, Firat and Serpil (2017) found that Turkish preservice teachers actively use the Internet, with younger preservice teachers using the Internet more frequently than older preservice teachers. Similarly, smartphones have rapidly proliferated in Turkey over the past decade. As of January 2019, the total number of mobile subscriptions is estimated to be over 76 million, corresponding an approximate mobile penetration rate of 93%, and 77% of the population are estimated to be smartphone users (We are Social, 2019).

Undoubtedly, the widespread adoption of various ICTs across various demographic groups in Turkey has been a popular research topic in many academic disciplines,

including education. For instance, Kilinc et al. (2016) investigated Turkish preservice teachers' views on the adoption of information and communication technologies for educational purposes and found that the attitudes of preservice teachers in Turkey towards the use and integration of various educational technologies, including smartphones, were positive. The study also revealed that Turkish preservice teachers associated minimal levels of risk with the use of educational technologies.

While Turkish preservice teachers have been shown to display positive attitudes toward educational technologies (Kilinc et al., 2016), previous research has shown that there is sufficient evidence to be concerned about the unintended negative effects of technology dependence on preservice teachers themselves. For example, Altundağ and Bulut (2017) investigated the prevalence of problematic smartphone usage among Turkish preservice teachers. The authors revealed that female preservice teachers were more likely to be addicted to their smartphones compared to male preservice teachers. The authors also found a positive relationship between the frequencies of smartphone, social media, and Internet usage and smartphone addiction levels of the preservice teachers. Likewise, Arnavut, Nuri, and Direktör (2018) found that social media usage frequency of Turkish preservice teachers was a significant positive predictor of their smartphone addiction levels. Arnavut et al. (2018) also showed that female preservice teachers' smartphone addiction level was higher than that of male preservice teachers. That said, Konan, Durmuş, Türkoğlu and Ağıroğlu Bakır (2018) investigated smartphone addiction levels of preservice teachers in Turkey and found no significant differences between female and male preservice teachers. While there are some mixed findings in the literature, previous research seems to indicate that there is a direct link between increased technology use and increased problematic usage patterns, with particular emphasis on the association between smartphone usage frequency and problematic smartphone usage behaviors. In the following sections, the literature on one of these problematic smartphone usage behaviors is reviewed in detail: nomophobia.

2.2. Nomophobia

Nomophobia refers to “the fear of being out of mobile phone contact” (SecurEnvoy, 2012, para. 1). The term nomophobia is a modern coinage and stands for no-mobile-phone phobia. Nomophobia is a relatively new phenomenon that has become more and more popular over the last five years since the publication of the Nomophobia Questionnaire (Yildirim & Correia, 2015). As a matter of fact, based on a public poll, the word nomophobia has been selected the word of the year for 2018 by Cambridge dictionary (Daily Mail, 2018), exemplifying the popularity of the term in mainstream media and among the public.

More formally, Yildirim and Correia’s (2015) conceptualization of nomophobia portrays it as an unintended consequence of individuals’ overdependence on smartphones and their capabilities. Yildirim et al. (2016, p. 1323) define nomophobia as the “fear of being unable to use one’s mobile phone or being unreachable through one’s mobile phone.” Nomophobia is characterized by “feelings of discomfort or anxiety experienced by individuals when they are unable to use their mobile phones or utilize the affordances these devices provide” (Yildirim et al., 2016, p. 1323). Nomophobic individuals tend to feel anxious and/or experience discomfort when they cannot use their smartphone, when they are not connected to the Internet, when the battery of their smartphone is low, when they run out of battery, or when network coverage is limited (Akillı & Gezgin, 2016; Yildirim & Correia, 2015).

2.3. Measuring nomophobia

While academic research on problematic mobile phone use dates back to early 2000s (Bianchi & Phillips, 2005), the literature on nomophobia has developed rapidly over the past five years and continues to expand day by day. The impetus for the academic interest in nomophobia came from the Yildirim and Correia (2015) study in which the authors developed and validated a self-reported questionnaire to measure nomophobia, following a mixed-methods research design.

Based on their findings, Yildirim and Correia (2015) proposed the four dimensions of nomophobia: not being able to communicate, losing connectedness, not being able to

access information, and giving up convenience. According to Yildirim and Correia (2015, p. 133), the dimension of not being able to communicate refers to the “feelings of losing instant communication with people and not being able to use the services that allow for instant communication”. The dimension of losing connectedness refers to the “feelings of losing the ubiquitous connectivity smartphones provide, and being disconnected from one’s online identity, especially on social media” (Yildirim & Correia, 2015, p. 133). The dimension of not being able to access information refers to the “discomfort of losing pervasive access to information through smartphones, being unable to retrieve information through smartphones and search for information on smartphones” (Yildirim & Correia, 2015, p. 134). Lastly, the dimension of giving up convenience refers to the “feelings of giving up the convenience smartphones provide and reflect the desire to utilize the convenience of having a smartphone” (Yildirim & Correia, 2015, p. 134).

The outcome of the study was a 20-item questionnaire measuring the four dimensions of nomophobia that Yildirim and Correia (2015) called the Nomophobia Questionnaire (NMP-Q). Yildirim and Correia (2015) demonstrated that the NMP-Q produces valid and reliable scores and could be used as a self-reported measure of nomophobia levels. The NMP-Q asks respondents to rate the extent to which they agree/disagree with each of the 20 items on a 7-point Likert scale (strongly disagree – strongly agree). Based on the responses, a total NMP-Q score is calculated ranging from 20 to 140. An NMP-Q score of 20 indicates that the respondent does not have nomophobia. NMP-Q scores greater than 20 but less than 60 are indicative of mild levels of nomophobia, while NMP-Q scores greater than 60 but less than 100 indicate moderate levels of nomophobia. NMP-Q scores greater than 100 indicate severe levels of nomophobia.

Since the publication of the NMP-Q in 2015, research into nomophobia has flourished and the NMP-Q has been translated and adapted into various languages and cultures, including, but not limited to, Turkish (Yildirim et al., 2016), Italian (Adawi et al., 2018), Spanish (Gutiérrez-Puertas, Márquez-Hernández, & Aguilera-Manrique,

2016), Chinese (Ma, & Liu, 2018), Persian (Lin, Griffiths, & Pakpour, 2018), and Arabic (Al-Balhan et al., 2018). Across multiple cultures and samples, previous studies have provided substantial evidence for the construct validity of the NMP-Q and have shown that it could be used to measure nomophobia. Therefore, it can be concluded that the NMP-Q can be used in research studies as a self-reported measure of nomophobia that produces valid and reliable scores.

2.4. Prevalence of nomophobia

Considering the proliferation of smartphones and smartphone users' dependence on these devices, it is reasonable to assume that nomophobia would be a prevalent issue in the society. Despite the infancy of the nomophobia literature, a considerable number of studies have shown that this assumption holds true. To begin with, a public survey study done in the UK in 2008 revealed that 53% of the surveyed participants exhibited nomophobic behaviors (Mail Online, 2008). The results of the study also indicated that gender differences existed in nomophobia levels with more male participants demonstrating nomophobic behaviors than female participants. In another study conducted a few years later, it was found that the prevalence of nomophobia among British adults witnessed an increase from 53% to 66% SecurEnvoy (2012). The SecurEnvoy study conducted in 2012 found that nomophobia was more common among female participants than among male participants, which is different from the 2008 study. Several other studies revealed similar findings regarding the prevalence of nomophobia among various populations around the world (King et al., 2014; Sharma, Sharma, Sharma, & Wavare, 2015; Tavoracci, Meyrignac, Richard, Dechelotte, & Ladner, 2015).

More relevant to the current study, nomophobia has also been shown to be a prevalent issue in Turkey. For example, in one of the first studies into the prevalence of nomophobia among young adults in Turkey, Yildirim et al. (2016) showed that 42.6% of university students demonstrated nomophobic behaviors. In addition, Gezgin and Adnan (2016) reported similar findings and found that the severity of nomophobia

among more than 400 university students who participated in the study was above the average. Similarly, Gezgin & Çakır (2016) found that high school students demonstrated nomophobic behaviors and that their nomophobia levels were above the average. Furthermore, in a large study of preservice teachers, Gezgin et al. (2017) showed that nomophobia was a common issue among preservice teachers with the majority of them having moderate levels of nomophobia. Moreover, Ayar et al. (2018) demonstrated that nomophobia was a common problem among nursing students and provided evidence for the link of nomophobia to problematic Internet use and social media dependency. Similar findings regarding the prevalence of nomophobia in Turkey have been reported by other studies (e.g., Akıllı & Gezgin, 2016; Dağlı, Hamutoğlu, & Gezgin, 2017) as well.

These findings indicate that nomophobia is a prevalent issue among various populations in Turkey, especially among young individuals. This highlights the need for further studying nomophobia and better understanding its predictors.

2.5. Predictors of Nomophobia

Based on the notion that demographic characteristics and preexisting psychological personality-related factors are involved in individuals' disposition to problematic mobile phone use behaviors (Bianchi & Phillips, 2005; Hong et al., 2012), previous studies have closely examined various demographic and personality factors as potential predictors of problematic mobile phone use behaviors.

While research into nomophobia has grown rapidly over the past years, a limited number of studies have specifically focused on the predictors of nomophobia, with the exception of a few studies that have looked at demographic factors contributing to nomophobia (e.g. Yogurtcu, 2018). Therefore, previous studies on the predictors of problematic mobile phone use behaviors are also reviewed in this section, because nomophobia can be considered one specific type of problematic mobile phone usage and is expected to be similar to other types of problematic mobile phone usage, such as addiction and compulsive usage, in terms of its effects on individuals.

2.5.1. Demographic factors

Previous studies have widely examined two demographic factors, namely gender and age, as potential predictors of nomophobia and problematic mobile phone use behaviors and investigated individual differences in nomophobia and problematic mobile phone use behaviors with respect to age and gender.

2.5.1.1. Gender

Gender differences in nomophobia and problematic mobile phone use behaviors have been of interest to many researchers. While a considerable number of studies have investigated gender as a potential predictor of both mobile phone use and problematic mobile phone use, their results as to which group is more prone to nomophobia and problematic mobile phone use behaviors are somewhat mixed.

Previous studies attributed gender differences in mobile phone use to the fact that the main use of mobile phones for females was to stay in touch with persons they value, while males tended to use their mobile phone for functional purposes (Lemish & Cohen, 2005; Rees & Noyes, 2007). In an early study, Bianchi and Phillips (2005) found that gender was a predictor of type of mobile phone use, with females using their mobile phone for social reasons and males for making phone calls. In partial agreement with the previous study, Toda, Monden, Kubo and Morimoto (2006) showed that males used their mobile phone for calling, while females used their mobile phone for Internet services. In another study, Billieux, Van der Linden and Rochat (2008) found that females spent more time using their mobile phone for texting. Moreover, it was found that males used their mobile phone more for exploration and games, whereas females used them for communication purposes (Sánchez-Martínez & Otero, 2009). Still and all, Billieux et al. (2007) revealed that there was no association between gender and frequency of mobile phone use, which was supported by Reid & Reid (2007) study that disclosed no gender differences in mobile phone use.

Similar to the results related to gender differences in mobile phone use, past studies produced mixed results regarding gender differences in problematic mobile phone use. On one hand, Billieux et al. (2007) disclosed that females were more involved with their mobile phone. Similarly, in another study, Billieux et al. (2008) found that females were more addicted their mobile phones than males and showed more signs of mobile phone dependency. Other studies also confirmed that female gender was a predictor of problematic mobile phone use (Andreassen et al., 2013; Augner and Hacker, 2012; Jenaro et al., 2007; Takao et al., 2009). Furthermore, Martinotti et al. (2011) verified the association between female gender and problematic mobile phone use. However, they reported that gender had no significant effect on problematic mobile phone use behavior when controlled by age, meaning that older females may not be so susceptible to problematic mobile phone use behavior.

Contrary to these studies that found gender differences in problematic mobile phone use, some studies showed no gender differences. Bianchi and Phillips (2005) demonstrated that gender was not a predictor of problematic mobile phone use. In explaining why no associations existed between gender and problematic mobile phone use behaviors, they asserted that mobile phones were equally appealing to both males and females, and that both groups equally accepted and adopted mobile phones. That gender differences did not exist in problematic mobile phone use behaviors was supported by another recent study that found no associations between gender and mobile phone addiction (Salehan & Negahban, 2014).

In relation to gender differences in nomophobia, one of the early studies revealed that female university students demonstrated more nomophobic behaviors than male university students (Yildirim et al., 2016). In a large study conducted with 818 preservice teachers, Gezgin et al. (2017) found that female preservice teachers were more nomophobic than male preservice teachers. In addition, in their study conducted among more than 400 high school students, Gezgin & Çakır (2016) found that female adolescents demonstrated more nomophobic behaviors than male adolescents. Moreover, Yoğurtçu (2018) found that female university students were more

nomophobic than male students. In contrast to these studies, Dağlı, Hamutoğlu and Gezgin (2017) found no gender differences in nomophobia levels among preschool teachers, which might be explained by age differences across the different samples used in these studies.

2.5.1.2. Age

Owing to the rapid proliferation of mobile phones particularly among adolescents and young adults, previous studies argued that young individuals would be more inclined to demonstrate problematic mobile phone use behaviors. One of the early studies in the literature (Bianchi & Phillips, 2005) investigated the phenomenon of problematic mobile phone use among a sample diverse in terms of age. The study found that age was significantly associated with problematic use and that young people were more likely to exhibit problematic mobile phone use behaviors than were older people in the sample. Hence, they related young people's tendency toward problematic mobile phone use to their inclination to adopt new technologies. The susceptibility of young people to problematic mobile phone use behavior was further corroborated by more recent studies in the literature (Augner & Hacker, 2012; Buckner et al., 2012; Sánchez-Martínez & Otero, 2009; Smetaniuk, 2014; Walsh et al., 2011).

Similar findings have been reported by studies that directly examined the relationships between nomophobia and age. For instance, SecureEnvoy (2012) found that adults aged 18-24 (77%) demonstrated more nomophobic behaviors than adults aged 24-34 (68%). In the same manner, Gezgin et al. (2017) showed that younger preservice teachers were more likely to demonstrate nomophobic behaviors than older preservice teachers. Dağlı et al. (2017) also found that younger preschool teachers demonstrated more nomophobic behaviors than older preschool teachers. However, Yildirim et al. (2016) found no significant differences in nomophobia levels between university students aged 18-20 and those aged 20 or older.

Given the substantial evidence for the significant association between age and problematic mobile phone use, the contention that young people are more likely to

exhibit more problematic mobile phone use behaviors in general and more nomophobic behaviors in particular can be relied upon as convincing. It should be, however, noted that some studies employed a sample with a restricted age range. Therefore, more studies using a sample with a broader age range, similar to Augner & Hacker (2012) and Smetaniuk (2014), can contribute to the generalizability of this assumption.

2.5.2. Personality Traits

In addition to demographic factors, previous studies have also focused on personality traits as a potential predictor of problematic mobile phone use behaviors due to the influence of personality on interpersonal interactions (Eysenck, 1994). These studies have widely adapted the Five-Factor Model of Personality (FFM, McCrae & Costa, 1992), which views personality as a multidimensional construct organized hierarchically from narrow to broad traits, including extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. FFM has been empirically shown to possess a strong predictive validity to explain personality and its five dimensions have been reliably measured across various contexts and samples (McCrae & Costa, 1992). Consequently, FFM has recently been developed into the Five-Factor Theory (FFT) of Personality (McCrae & Costa, 2008). While FFM or FFT might not be the sole, exact representation of an individual's personality, it can elucidate how personality traits play a role in an individual's behaviors (Epstein, 2010).

These innate traits or dispositions shape an individual's feelings, thoughts and actions (McCrae & Costa, 2008). That's why these factors have received a great deal of attention from researchers investigating problematic mobile phone use behaviors on the grounds that they may account for problematic behaviors (Phillips, Butt & Blaszczynski, 2006). In the following sections, each of these five factors is described and the related studies are examined. Given the scarcity of research into the relationship between personality traits and nomophobia, this section mainly builds on

previous studies that have investigated the association between personality traits and problematic mobile phone use behaviors, assuming that the relationship between personality traits and nomophobia would reveal similar findings.

2.5.2.1. Extraversion

Extraversion encompasses dispositions associated with being warm, gregarious, assertive, sensation-seeking and having positive emotions (Anastasi & Urbina, 1997). Extraverts are sociable individuals seeking social interaction and they tend to be talkative, outgoing and enthusiastic (Costa & McCrae, 1992).

Previous studies revealed that extraverts are inclined to spend more time using their mobile phones (Bianchi & Phillips, 2005; Butt & Phillips, 2008; Ehrenberg et al., 2008). Given that mobile phones provide ubiquitous connectivity to an individual's contacts and social networks and enable the individual to have constant access to opportunities for social interaction anywhere anytime, it becomes apparent that there exists an association between mobile phone behavior and extraversion (Bianchi & Phillips, 2005).

One of the early studies into the psychological predictors of problematic mobile phone use (Bianchi & Phillips, 2005) argued that extraverts would be more prone to addictive and problematic behaviors, and that extraversion would significantly predict problematic mobile phone use owing to extraverts' tendency to be affected by social influences, on which mobile phones seem to have an enormous impact. They found out that extraversion was a predictor of both overall mobile phone use and problematic mobile phone use. This result was empirically corroborated by the recent consecutive studies in the literature. Hong et al. (2012) examined the relationship between psychological characteristics and mobile phone addiction among Taiwanese female university students. They provided empirical support for the predictive effect of extraversion on mobile phone addiction. Similarly, Augner & Hacker (2012), Andreassen et al. (2013) and Smetaniuk (2014) verified the association between extraversion and problematic mobile phone use such that extraverts would be more

susceptible to exhibit problematic mobile phone use behaviors. The association between extraversion and problematic mobile phone use is generally ascribed to the fact that extraverts look for social stimulation (Andreassen et al., 2013), which can be well provided by mobile phones.

Regarding the direct relationship between extraversion and nomophobia, Yoğurtçu (2018) conducted a study with more than 400 university students in Turkey. Results of the Yoğurtçu (2018) study revealed that extraversion and nomophobia were positively correlated, indicating that extraverted students were more likely to demonstrated nomophobic behaviors.

Notwithstanding these studies, only one study (Buckner, Castille, & Sheets, 2012) disclosed opposing results regarding the association between extraversion and problematic mobile phone use behavior. They sought to explore the effects of personality traits on problem and pathological use of text-messaging among professional adults. They revealed that no association could be made between extraversion and problematic mobile phone behavior, which led them to the conclusion that the relationship between personality and problematic mobile phone use may be explained by some other factors that were not considered in the study (Buckner et al., 2012). One possible explanation for this result may be that this study focused on a sample of employees with a mean age of 30.6 years, whereas aforementioned studies that supported the predictive effect of extraversion mentioned studies concentrated on adolescents and university students. This may point to differences between young extraverts and professional extraverts in their predisposition to problematic mobile phone behaviors, which warrants further comparative studies.

2.5.2.2. Agreeableness

The characteristics that represent agreeableness include trust, straightforwardness, altruism, compliance, modesty and tender-mindedness (Anastasi & Urbina, 1997). Agreeable individuals tend to be friendly and sociable (Costa & McCrae, 1992).

Previous studies (Butt & Phillips, 2008; Ehrenberg et al., 2008) showed that individuals scoring low on agreeableness (i.e., disagreeable individuals) reported using their mobile phone more than those with higher scores on agreeableness. In contrast, in a recent study, it was found that agreeableness was not a predictor of mobile phone use (Lee, Tam & Chie, 2013).

While the agreeableness dimension of personality has been investigated as a predictor of mobile phone use, it has received relatively scarce attention as a predictor of problematic mobile phone behaviors. In one of the few studies looking at this topic, Andreassen et al. (2013) specifically examined agreeableness as a potential predictor of problematic mobile phone behaviors. They revealed that agreeableness was negatively correlated with mobile phone addiction, meaning that agreeable individuals were less likely to develop addiction to mobile phones. However, Yoğurtçu (2018) found that there was no significant correlation between agreeableness and nomophobia levels in a Turkish undergraduate student sample.

Considering the fact that disagreeable individuals are more likely to develop anti-social personality disorders (Butt & Phillips, 2008), the dimension of agreeableness needs to be explored as a probable predictor to ascertain a sounder association between agreeableness and nomophobia.

2.5.2.3. Conscientiousness

Conscientiousness is the dimension of personality that is related to competence, achievement, self-discipline and dutifulness (Anastasi & Urbina, 1997). Conscientious people are usually known to be good at working towards established goals, whilst unconscientious people tend to be disorganized (Costa & McCrae, 1992).

Previous studies (Butt & Phillips, 2008; Ehrenberg et al., 2008) found that individuals scoring low on conscientiousness (i.e. unconscientious individuals) spent more time using their mobile phone for texting. Based on these studies, Lee et al. (2013) hypothesized that conscientiousness would be a predictor of mobile phone use for texting, in such a way that unconscientious individuals would spend more time texting.

They, however, discovered that conscientiousness was not a predictor of frequency of texting. They also asserted that unconscientious individuals would use texting as a means of procrastination (Lee et al., 2013).

A limited number of studies have examined conscientiousness as a predictor of problematic mobile phone use behavior. Buckner et al. (2012) disclosed that conscientiousness predicted problematic uses of several technologies, including mobile phones for texting. They concluded that conscientious employees were less likely to exhibit problematic mobile phone use for texting. On the other hand, Andreassen et al. (2013) demonstrated that conscientiousness was negatively related to several addictive behaviors (e.g., Facebook addiction, video game addiction, and Internet addiction) and positively related to exercise addiction and study addiction among university students. Nevertheless, no associations could be found between conscientiousness and problematic mobile phone use behavior. Similar to Andreassen et al. (2013), However, Yoğurtçu (2018) found that there was no significant correlation between conscientiousness and nomophobia levels in a Turkish undergraduate student sample.

This inconsistency in the relationship between conscientiousness and problematic mobile phone use behaviors may be explained by the age difference of the samples used in these studies, since young adults are expected to be more prone to problematic mobile phone use (Cheever, Rosen, Carrier & Chavez, 2014). Possibly, conscientious employees surveyed in Buckner et al. (2012) may be able to develop and employ strong self-control mechanisms that enable them to monitor their mobile phone use. As for university students, this may not be as effective due to the developmental stage they are going through. During young adulthood, they may not have completely developed effective self-control mechanisms that would help them cope with the distractions caused by their mobile phones.

2.5.2.4. Neuroticism

Neuroticism pertains to the fluctuations in emotions and is associated with such dispositions as anxiety, impulsiveness and self-consciousness (Anastasi & Urbina, 1997). Neurotic individuals tend to demonstrate sensitivity and vulnerability to emotional stimuli in their social environment (Costa & McCrae 1992).

Previous studies (Butt & Phillips, 2008; Ehrenberg et al., 2008) showed that individuals with a high score on neuroticism spent more time using their mobile phone for texting, which Lee et al. (2013) attributed to the fact that neurotic individuals preferred using text messaging as a way to cope with the anxiety induced by face-to-face interactions. Therefore, Lee et al. (2013) hypothesized that neuroticism would be negatively correlated with frequency of voice calling and positively correlated frequency of text messaging. Nevertheless, they found no such impact of neuroticism. This result, on the other hand, was in congruence with early research that found no associations between neuroticism and mobile phone use (Bianchi & Phillips, 2005; Phillips et al., 2006).

Despite these studies concerned with the relationship between neuroticism and mobile phone use, only two studies (Buckner et al., 2012; Ehrenberg et al., 2008) were identified in the literature that examined the impact of neuroticism dimension of personality on problematic mobile phone use behaviors. Based on Bianchi and Phillips' (2005) contention that neurotic people would avoid using their mobile phone for texting to curtail their communication anxiety and restrict the amount of contact they have with others, Buckner et al. (2012) hypothesized that neuroticism and problematic mobile phone use behavior would be negatively related. Nonetheless, their results rejected this hypothesis and showed that neuroticism had no effect on employees' problematic mobile phone use behaviors. In contrast, Ehrenberg et al. (2008) found neuroticism was a significant predictor of young adults' addictive tendencies such that neurotic university students would be more likely to have addictive tendencies toward mobile phone use. Similarly, Yoğurtçu (2018) found that there was a positive correlation between neuroticism and nomophobia levels in a Turkish undergraduate student sample, indicating that neurotic students were more

likely to demonstrate nomophobic behaviors. Considering these mixed results regarding the association between neuroticism and nomophobia levels, further research is needed to better understand how neuroticism is related to nomophobia.

2.5.2.5. Openness-to-experience

The characteristics associated with openness-to-experience involve intellectual curiosity, inquisitiveness, aesthetic sensitivity, alertness to feelings and imagination (Costa and McCrae, 1992). Individuals scoring high on openness-to-experience tend to be adventurous and like to explore new things, ideas, and ways of doing (Costa and McCrae, 1992).

Of all the five dimensions of personality, openness-to-experience seems to be the one that has garnered the least attention from researchers investigating the relationship between personality traits and mobile phone use behaviors (Lee et al., 2013). That being said, Lee et al. (2013) found that openness-to-experience was related to frequency of mobile phone use such that individuals open to experience used their mobile phone more than those individuals scoring low on openness-to-experience, which they chalked up to open individuals' tendency to be inquisitive and curious and the affordances mobile phones provide for them to be able to easily convey their feelings, ideas and thoughts.

Regarding the association between openness-to-experience and problematic mobile phone use behavior, the literature search identified only one study that examined such a relation (Andreassen et al., 2013). The authors disclosed that openness-to-experience was a predictor of mobile phone addiction and that university students with lower scores on openness-to-experience were more susceptible to mobile phone addiction as well as Facebook addiction. Likewise, Yoğurtçu (2018) found that there was a negative correlation between openness-to-experience and nomophobia levels in a Turkish undergraduate student sample, indicating that university students with lower scores on openness-to-experience were more likely to demonstrate nomophobic

behaviors. Just as this result may be surprising to some extent, it is yet to be substantiated by additional studies.

2.6. Summary

This chapter provided a review and synthesis of the relevant literature on nomophobia, its measurement, prevalence, and potential predictors, including personality traits (i.e., extraversion, agreeableness, conscientiousness, neuroticism, and openness-to-experience). Based on the review, it is apparent that along with their numerous benefits, such as instant communication, constant access to information, etc., the proliferation of smartphones has brought about a negative consequence; the fear of not being able to use one's smartphone, or simply nomophobia. The review has also shown that nomophobia is a prevalent issue in our modern world and that it is especially a common problem among young adults. The existing literature shows that gender differences exist in individual's susceptibility to nomophobia. Specifically, females tend to demonstrate more nomophobic behaviors than males. Regarding the personality-related factors contributing to nomophobia, it seems that extraversion is a positive predictor of nomophobia and, more broadly, of problematic mobile phone use behaviors. In regard to the other four personality traits, previous research has produced mixed results, highlighting the need for examining personality-related predictors of nomophobia. The review also highlights the need for further studying nomophobia among preservice teachers.

CHAPTER 3

METHODOLOGY

This chapter provides a detailed description of the methodology that was followed throughout the entire study. The chapter starts with a description of the research design and sampling. Then, a description of the instrumentation process is provided, along with a description of the data collection tools. The chapter concludes by providing a summary of the data collection and analysis procedures.

3.1. Research Design

The current study utilized the associational research methodology to address the guiding research questions (Fraenkel, Wallen, & Hyun, 2011) by examining the relationship between preservice teachers' nomophobia levels and various demographic and personality-related characteristics. More specifically, the current study followed the causal-comparative design to examine the differences in nomophobia levels with respect to existing groups within the preservice teachers sample (Fraenkel et al., 2011). The survey research method was used to collect data from a large group of individuals at one point in time using a self-reported questionnaire, which makes it a cross-sectional design (Fraenkel et al., 2011).

3.2. Sampling

The current study employed the convenience sampling method to recruit participants and administer the questionnaire to a large number of individuals (Fraenkel et al., 2011). The data were collected from preservice teachers studying at a public university in the Central Anatolia region of Turkey to which the researcher had easy access. While this method of sampling is prone to sampling bias (Fraenkel et al., 2011), the advantage of having easy access to representative participants and collecting data from

a large number of participants in a relatively short time provided the foundation for adopting convenience sampling in this study.

3.3. Participants

The questionnaire was administered to 496 preservice teachers at an Anatolian university in Turkey during the 2018 – 2019 academic year. After cleaning the data and omitting the responses with missing data, the final sample consisted of 458 preservice teachers with an average age of 21.02 years old. Of the 458 preservice teachers, 329 were female and 125 were male. Table 3.1. presents a detailed summary of the demographics of the participants in the sample.

3.4. Instrumentation

The current study employed a self-reported questionnaire administered on paper. Prior to data collection, ethics approval was obtained from Middle East Technical University (METU) Ethics Committee (Appendix A). The questionnaire, which is available in Appendix B, was comprised of three major sections, namely demographics, personality traits, and nomophobia. Each of these three measures is described below.

3.4.1. Demographics

The Demographics section of the questionnaire contained the items designed to collect demographic information about participants. The questions were related to participants' gender, age, year of study, major, and duration of smartphone ownership.

3.4.2. Personality Traits

Personality traits were measured using the short version of the Big Five Inventory (BFI-10) developed by Rammstedt and John (2007). The current study used the Turkish version of the BFI-10 adapted into Turkish by Horzum, Ayas, and Padir (2017). The BFI-10 is a 10-item questionnaire rated on a 5-point Likert scale. The BFI-10 measures the five dimensions of personality: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. The BFI-10 contains two

items for each of these five dimensions, adding up to a total of 10 items. Items 1, 3, 4, 5, and 7 were reverse coded so that greater scores would indicate greater levels of extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. For each dimension, an average score was computed for analysis purposes. The Cronbach's alpha value for the BFI-10 scores was .43.

Table 3.1. *Demographics of the Participants in the Sample*

Variable	<i>n</i>	%
Gender		
Female	329	71.83
Male	125	27.29
Age		
18-20	176	38.43
21-24	260	56.77
25 or older	15	3.28
Major		
Computer Education and Instructional Technology	58	12.66
Mathematics Education	91	19.87
Science Education	120	26.20
Social Studies	64	13.97
Elementary Education	63	13.76
Psychological Counseling and Guidance (PCG)	62	13.54
Year of Study		
Freshman	100	21.83
Sophomore	112	24.45
Junior	152	33.19
Senior	94	20.52
Duration of Smartphone Ownership		
Less than a year	4	0.87
1 year to less than 2 years	21	4.59
2 years to less than 3 years	38	8.30
3 years to less than 4 years	66	14.41
4 years to less than 5 years	84	18.34
5 years or more	244	53.28

3.4.3. Nomophobia Questionnaire

Nomophobia levels were operationally defined as the total score on the Nomophobia Questionnaire (NMP-Q) developed by Yildirim and Correia (2015). The Turkish version of the NMP-Q, adapted into Turkish by Yildirim et al. (2016) was used in the current study. The NMP-Q contains 20 items rated on a 7-point Likert scale. The NMP-Q measures the four dimensions of nomophobia and produces a total score as an index of an individual's overall nomophobia level. The total NMP-Q score ranges from 20 to 140, with greater scores indicating greater levels of nomophobia. For each participant, a total NMP-Q score was computed for analysis purposes. The reliability of the scores produced by the NMP-Q in the current sample was very good, as indicated by a Cronbach's alpha value of .93.

3.5. Data Collection

The questionnaire containing the previously mentioned three sections was administered on paper. Printed questionnaires were distributed to participants in person, who then completed and returned the questionnaires to the proctors.

3.6. Data Analysis

For data analysis purposes, the paper-based questionnaires were first digitized and entered into a spreadsheet. The final dataset was examined for accuracy. To analyze the data, the research questions were used as a reference. Several descriptive and inferential statistics were conducted to analyze the data and answer each of the previously mentioned research questions. Specifically, for the first research question, descriptive statistics were used to calculate means, standard deviations, frequencies, and percentages. For the second research question, independent-samples t test was conducted when the grouping variable contained two levels and a one-way analysis of variance was conducted when the grouping variable contained three or more levels. For the third and final research question, a multiple regression analysis was conducted.

CHAPTER 4

RESULTS

This chapter provides a summary of the descriptive and inferential statistics conducted to analyze the data and answer the research questions that guided the current study. This chapter is organized in terms of the research questions. For each research question, corresponding results are presented.

4.1. The prevalence of nomophobia among Turkish preservice teachers

The average nomophobia score of the sample ($n = 458$) was 79.83 ($SD = 24.44$), which would be classified as moderately nomophobic based on the NMP-Q scoring guidelines (Yildirim & Correia, 2015). Of the 458 preservice teachers in the sample, 22.5% ($n = 103$) were severely nomophobic, 55% ($n = 252$) were moderately nomophobic, 22.3% ($n = 102$) were mildly nomophobic, and 0.2% ($n = 1$) were identified as not nomophobic (Table 4.1).

Table 4.1. Prevalence of Nomophobia among the Sample

	<i>n</i>	<i>%</i>
Nomophobia Levels		
Not Nomophobic	1	.2%
Mildly Nomophobic	102	22.3%
Moderately Nomophobic	252	55%
Severely Nomophobic	103	22.5%

4.2. Differences in preservice teachers' nomophobia levels

The second research question was aimed at describing the differences in preservice teachers' nomophobia levels with respect to various demographics factors, including gender, major, year of study, and duration of smartphone ownership. Results for each of these factors are presented below.

4.2.1. Gender

Table 4.2. *Nomophobia Levels of Female and Male Preservice Teachers*

	<i>n</i>	<i>M (SD)</i>	<i>t</i>	<i>df</i>	<i>p</i>	<i>M_{diff}</i>	<i>d</i>
Gender			3.20	452	.001	8.12	.34
Female	329	82.06 (23.98)					
Male	125	73.94 (24.72)					

Note: 4 participants did not answer this question. d refers to Cohen's d.

An independent-samples *t* test was conducted to compare the nomophobia levels for female and male preservice teachers. Assumptions of normality, as assessed by Shapiro-Wilk's test ($p > .05$) and homogeneity (equality) of variances, as assessed by Levene's test ($p > .05$) were met. Results showed a statistically significant difference between females and males, $t(452) = 3.20$, $p = .001$. An examination of the average nomophobia levels revealed that female preservice teachers ($M = 82.06$, $SD = 23.98$) were more nomophobic than male preservice teachers ($M = 73.94$, $SD = 24.72$).

4.2.2. Age

Table 4.3. *Nomophobia Levels with Respect to Age*

Variable	<i>n</i>	<i>M (SD)</i>	<i>F</i> (2, 448)	<i>MSE</i>	<i>p</i>
Age			.435	261.02	.647
18-20	176	79.97 (24.14)			
21-24	260	79.33 (24.79)			
25 or older	15	85.33 (23.10)			

Note: 7 participants did not answer this question.

Table 4.3 provides a summary of the descriptive and inferential statistics for nomophobia levels with respect to participants' age group. ANOVA results revealed that there was no statistically significant difference in nomophobia levels with respect to preservice teachers' age group, $F(2, 448) = .435$, $p = .647$.

4.2.3. Major

Table 4.4. *Nomophobia Levels with Respect to Major*

Variable	<i>n</i>	<i>M (SD)</i>	<i>F (5, 452)</i>	<i>MSE</i>	<i>p</i>
Major			3.07	1794.47	.01
CEIT	58	79.43 (26.28)			
Mathematics Education	91	81.45 (22.43)			
Science Education	120	77.67 (24.77)			
Social Studies	64	81.83 (26.36)			
Elementary Education	63	87.78 (20.90)			
Psychological Counseling and Guidance	62	71.87 (24.10)			

Table 4.4 provides a summary of the descriptive and inferential statistics for nomophobia levels with respect to major. An examination of the descriptive statistics revealed that elementary education preservice teachers had the greatest level of nomophobia levels and that psychological counselling and guidance (PCG) preservice teachers had the lowest level of nomophobia levels.

A one-way analysis of variance (ANOVA) was conducted to examine the differences in nomophobia levels with respect to preservice teachers' major. Results revealed a significant difference in nomophobia levels, $F(5, 452) = 3.07$, $p = .01$. Post-hoc comparisons using the Tukey test indicated that the only significant difference in nomophobia levels was between elementary education preservice teachers ($n = 63$, $M = 87.78.6$, $SD = 20.90$) and PCG preservice teachers ($n = 62$, $M = 71.87$, $SD = 24.10$), with the former displaying more nomophobic behaviors than the latter. There was no statistically significant difference in nomophobia levels among the other four majors.

4.2.4. Year of Study

Table 4.5. *Nomophobia Levels with Respect to Year of Study*

Variable	<i>n</i>	<i>M (SD)</i>	<i>F (3, 454)</i>	<i>MSE</i>	<i>p</i>
Year of Study			1.96	1160.25	.12
Freshman	100	77.94 (23.07)			
Sophomore	112	78.30 (25.69)			
Junior	152	83.72 (23.57)			
Senior	94	77.38 (25.30)			

Table 4.5 provides a summary of the descriptive and inferential statistics for nomophobia levels with respect to year of study. An examination of the descriptive statistics revealed that junior preservice teachers had the greatest level of nomophobia levels and that senior preservice teachers had the lowest level of nomophobia levels. However, ANOVA results revealed that there was no statistically significant difference in nomophobia levels with respect to preservice teachers' year of study, $F(3, 454) = 1.96, p = .12$.

4.2.5. Duration of Smartphone Ownership

Table 4.6. *Nomophobia Levels with Respect to Duration of Smartphone Ownership*

Variable	<i>n</i>	<i>M (SD)</i>	<i>F (5, 451)</i>	<i>MSE</i>	<i>p</i>
Duration of Phone Ownership			3.07	1797.46	.01
Less than a year	4	90.75 (18.73)			
1 year to less than 2 years	21	74.57 (21.86)			
2 years to less than 3 years	38	71.92 (24.99)			
3 years to less than 4 years	66	72.98 (21.42)			
4 years to less than 5 years	84	80.25 (21.27)			
5 years or more	244	83.00 (25.88)			

Table 4.6 provides a summary of the descriptive and inferential statistics for nomophobia levels with respect to duration of smartphone ownership. An examination of the descriptive statistics revealed that those preservice teachers who reported owning a smartphone for less than a year had the greatest level of

nomophobia levels and that those preservice teachers who reported owning a smartphone for 2 years to less than 3 years had the lowest level of nomophobia levels.

ANOVA results revealed a statistically significant difference in nomophobia levels with respect to duration of smartphone ownership, $F(5, 451) = 3.07, p = .01$. Post-hoc comparisons using the Tukey test indicated that the only significant difference in nomophobia levels was between preservice teachers who reported owning a smartphone for 3 years to less than 4 years ($n = 66, M = 72.98, SD = 21.42$) and preservice teachers who reported owning a smartphone for 5 years or more ($n = 244, M = 83.00, SD = 25.88$), with the latter displaying more nomophobic behaviors than the former.

4.3. Personality-Related Predictors of Preservice Teachers' Nomophobia Levels

Table 4.7. *Correlations among nomophobia levels and personality traits*

Variable	<i>M</i>	<i>SD</i>	2	3	4	5	6
1. Nomophobia	79.83	24.44	.078*	-.111**	-.001	.073	-.021
2. Extraversion	3.63	.899		.115**	.437***	-.130**	.283***
3. Agreeableness	3.96	.751			.081*	-.132**	.122**
4. Conscientiousness	3.78	.832				-.049	.267***
5. Neuroticism	2.92	.847					-.105*
6. Openness to experience	3.42	.857					

***. Correlations significant at the .001 level
 **. Correlations significant at the .01 level
 *. Correlations significant at the .05 level

Table 4.7 presents the correlations among preservice teacher's nomophobia levels and five personality traits. As seen in the table, nomophobia levels were positively correlated with extraversion scores, $r = .078, p < .05$, and were negatively correlated with agreeableness scores, $r = -.111, p < .01$, indicating that there was a weak relationship between nomophobia and these two personality traits.

Extraversion scores were positively correlated with agreeableness, $r = .115, p < .01$, conscientiousness, $r = .437, p < .001$ and openness to experience scores, $r = .283, p <$

.001, and were negatively correlated with neuroticism scores, $r = -.130, p < .01$. Agreeableness scores were positively correlated with conscientiousness, $r = .081, p < .05$, and openness to experience scores, $r = .122, p < .01$, and were negatively correlated neuroticism scores, $r = -.132, p < .01$. Openness to experience scores were positively correlated with conscientiousness scores, $r = .267, p < .001$, and were negatively correlated with neuroticism scores, $r = -.105, p < .05$.

Table 4.8. *Multiple Regression Analysis Predicting Nomophobia*

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>
Intercept	82.40	9.87		8.35
Extraversion	3.33	1.44	.12	2.31*
Agreeableness	-3.57	1.54	-.11	-2.33*
Conscientiousness	-1.05	1.54	-.04	-.68
Neuroticism	2.01	1.36	.07	1.48
Openness to experience	-.72	1.41	-.03	-.51

$F(5, 451) = 1.54, MSE = 1493.60, p = .028, R^2 = .027, R^2_{\text{adjusted}} = .017$
 *. Predictors significant at the .05 level

A multiple regression analysis was performed to determine whether the five personality traits could predict the preservice teachers' nomophobia levels (Table 4.8). Results revealed that this five-predictor model significantly explained 2.7% of the variance in nomophobia levels, $F(5, 451) = 1.54, MSE = 1493.60, p = .028, R^2 = .027$. Of the five personality traits, extraversion ($\beta = .12$) positively predicted nomophobia levels, whereas agreeableness ($\beta = -.11$) negatively predicted nomophobia levels.

CHAPTER 5

DISCUSSIONS

The current study set out to investigate the prevalence and predictors of nomophobia among preservice teachers in Turkey. The current study found that nomophobia was a prevalent issue among the Turkish preservice teachers in the sample, who were found to be moderately nomophobic on average. Of the 458 preservice teachers in the sample, 22.5% ($n = 103$) were severely nomophobic, 55% ($n = 252$) were moderately nomophobic, 22.3% ($n = 102$) were mildly nomophobic, and 0.2% ($n = 1$) were identified as not nomophobic.

One major objective of this descriptive study was to describe the differences in nomophobia levels of preservice teachers with respect to various demographic factors, including gender, major, year of study, and duration of smartphone ownership. In relation to gender, the current study found gender differences in Turkish preservice teachers' nomophobia levels. Specifically, female preservice teachers were significantly more nomophobic than male preservice teachers. This finding is consistent with the majority of the existing studies in the literature into the prevalence of nomophobia among preservice teachers in Turkey (e.g., Gezgin & Çakır, 2016; Gezgin et al., 2017; Yildirim et al., 2016; Yoğurtçu, 2018) and into the prevalence of problematic mobile phone use among young adults around the world (Andreassen et al., 2013; Augner and Hacker, 2012; Jenaro et al., 2007; Takao et al., 2009; Walsh et al., 2011).

A potential explanation for female preservice teachers' tendency to demonstrate more nomophobic behaviors than their male counterparts might be that females usually use their smartphones to communicate with their loved ones, whereas males tend to use their smartphones for more functional purposes, such as looking up certain

information (Lemish & Cohen, 2005; Rees & Noyes, 2007). This difference in usage patterns might be the reason for the difference in the nomophobia levels of female and male preservice teachers.

Although it may be tempting to assume that females are more likely to exhibit problematic mobile phone use behaviors in general and nomophobic behaviors in particular, other factors should be taken into consideration before making such an assumption. To begin with, similar to the current study, most of the previous studies (e.g., Walsh et al., 2011; Yildirim et al., 2016) that identified female gender as a predictor of problematic mobile phone use behaviors used an unbalanced sample in terms of gender, limiting the generalizability of the findings to larger, gender-balanced populations. In order to better explore whether and how gender differences influence nomophobia levels of preservice teachers and young adults, future studies with a sample equally balanced in terms of gender are needed.

In relation to age group, there was no statistically significant difference among preservice teachers aged 18-20, preservice teachers aged 21-24, and preservice teachers 25 or older. This could be attributed to the fact that all participants were in the same demographic cohort, Gen Z, and displayed similar characteristics. Another demographic variable closely related to preservice teachers' age is their year of study, which is why their nomophobia levels were compared with respect to their year of study. In relation to preservice teachers' year of study, the current study yielded no significant differences in nomophobia levels of preservice teachers with respect to their year of study.

This age-related finding is consistent with the Yildirim et al. (2016) study that found no age-related differences in nomophobia levels of Turkish college students and with other studies into problematic mobile phone usage patterns of Turkish college students (Çağan, Ünsal, & Çelik, 2014; Yildirim et al., 2016). It is important to point out that the age range of the majority of the preservice teachers in the current study was rather limited; 96.7% of the participants were aged between 18 and 24. This limited age

range may have influenced the results, because the majority of prior work into age-related differences in problematic mobile phone use behaviors have found that younger individuals tended to exhibit more problematic mobile use behaviors than older individuals (Augner & Hacker, 2012; Buckner et al., 2012; Dağlı et al., 2017; Gezgin et al., 2017; Sánchez-Martínez & Otero, 2009; Smetaniuk, 2014; Walsh et al., 2011). Therefore, future research should seek to further examine age-related differences in nomophobia levels by extending the current study to include various age groups with broader age ranges, similar to Augner & Hacker (2012) and Smetaniuk (2014).

In relation to preservice teachers' major, or field of study, participants came from one of these six majors: CEIT, Mathematics Education, Science Education, Social Studies, Elementary Education, and Psychological Counselling and Guidance (PCG). Of these preservice teachers, elementary education preservice teachers were more nomophobic than PCG preservice teachers, while there was no significant difference in nomophobia levels of other four majors.

Considering PCG preservice teachers' training, it can be speculated that PCG preservice teachers might have been biased when completing the questionnaires. One potential explanation could be the fact that PCG preservice teachers have greater self-awareness when it comes to administering and completing questionnaires and inventories and that they are more familiar with personality-related evaluations. They might have felt the need to portray themselves as less nomophobic when completing the questionnaire, biasing their responses to the questions related to nomophobia.

Previous studies have shown that the duration of smartphone ownership is a key factor in young adults' nomophobia levels (Yildirim et al., 2016; Gezgin et al., 2017). Therefore, this variable was also included in the current investigation. While there was no clear pattern in the differences observed in the nomophobia levels of preservice teachers, preservice teachers who reported owning a smartphone for 5 years or longer were more nomophobic compared to preservice teachers who reported owning a

smartphone for 3 years to less than 4 years. This finding is consistent with Yildirim et al. (2016) and partially indicates that the duration of smartphone ownership is closely linked to nomophobia. More specifically, this finding supports the argument that those individuals owning a smartphone for a longer period of time tend to demonstrate more nomophobic behaviors. This interpretation is sound on the grounds that when one utilizes a smartphone and its services for a longer period of time, they are more likely to become dependent and, in certain cases, over-dependent on their smartphone, leading such problems as nomophobia.

Apart from describing the differences in nomophobia levels of preservice teachers with respect to the previously mentioned demographic factors, another objective of the current study was to examine personality-related predictors of nomophobia among Turkish preservice teachers. This was done based on the Five-Factor Theory of Personality that views personality as a multidimensional construct organized hierarchically from narrow to broad traits, including extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience (McCrae & Costa, 2008). In terms of these five personality traits, results of the multiple regression analysis indicated that extraversion and agreeableness were the only personality traits that were significant predictors of preservice teachers' nomophobia levels, with extraversion being a positive predictor and agreeableness being a negative predictor. More specifically, preservice teachers scoring higher on extraversion were found to demonstrate more nomophobic behaviors, compared to preservice teachers scoring lower on extraversion. Preservice teachers scoring higher on agreeableness were found to be less nomophobic, compared to preservice teachers scoring lower on agreeableness. This finding is mostly in line with previous studies demonstrating that extraversion is the only strong predictor of problematic mobile phone use behaviors (Andreassen et al., 2013; Augner & Hacker, 2012; Hong, Chiu, & Huang, 2012; Smetaniuk, 2014). Based on the convergence of evidence on this finding, it seems that extraverted individuals, who tend to be communicative, are more likely to develop and exhibit more problematic mobile phone use behaviors. This could be attributed to

their need to communicate with their friends and family, leading them to become over-dependent on smartphones. Different from these previous studies, the current study found that agreeableness was another significant predictor of nomophobia. Regarding the relationship between nomophobia and the other three personality traits, previous studies provided ambiguous results, which is an open area for future research.

It should be noted that the amount of variance in nomophobia levels explained by these personality-related predictors was small. This could be attributed to potential problems with the validity of the 10-item personality measure, because a construct such as personality may be better measured using a self-reported questionnaire containing more questions tapping more deeply into different aspects of personality. Furthermore, the reliability of the scores produced by the BFI measure was problematic, indicating that the 10-item questionnaire may not have yielded valid and reliable scores of personality traits, limiting the generalizability of the current findings. Therefore, future studies could consider using the long version of the BFI to increase the validity and reliability of the measurements. It is also possible that participants may not have fully understood the items when completing the questionnaire.

5.1. Implications

Several implications can be drawn from the findings of the current investigation. To begin with, results clearly indicate that nomophobia is a prevalent issue among preservice teachers, with a considerable proportion of them exhibiting moderate to severe nomophobic behaviors. Considering the fact that preservice teachers are the teachers of tomorrow who will be educating future generations and serving as role models for them, it would be prudent for preservice teacher education programs to acknowledge and address this modern phobia during the formal training of preservice teachers and proactively eliminate the possibility of this prevalent issue becoming a more severe problem when preservice teachers graduate and begin their teaching career. Instead of reactively trying to solve this problem by offering in-service training programs to currently-appointed teachers, policy makers and curriculum designers

could incorporate into teacher education curricula courses/seminars/training regarding the unintended negative consequences of technology in general and educational technology in particular.

Additionally, given the smartphones' place in our society as ICTs and in our schools as educational tools, there is a need to prepare preservice teachers against the negative effects of overdependence on smartphones and raise their awareness on this issue. This could be accomplished by teaching preservice teachers about the negative effects of overdependence on technology and encouraging them to self-regulate their technology usage so that they can serve as role models for students and model healthy use of technology for their prospective students.

Furthermore, policy makers and administrators should be aware of the potential disruptive impact of nomophobia on teachers' instructional effectiveness and implement in-service interventions to raise awareness on this rising problem and help teachers self-regulate their smartphone usage.

5.2. Limitations

When interpreting the findings from the current study, some limitations should be considered. First, the sample of preservice teachers was conveniently selected from an accessible population at a public university in Turkey. While this convenient sample provided easy access to the target population, it may not be completely representative of the target population, limiting the generalizability of the current findings to the larger population of preservice teachers in Turkey. Second, although the current study recruited a relatively large sample, the sample itself was unbalanced in terms of gender, with females greatly outnumbering males. Last, the current study used self-reported questionnaires to operationalize and measure the study constructs. While self-reported measures are valid instruments to easily collect attitudinal data from a large amount of participants in a short time, there is a heavy reliance on participants' candidness in completing the questionnaire and answering the questions. Therefore,

self-representation bias is another limitation of the current study, which should be kept in mind during the interpretation of the current findings.

5.3. Future Research

Future studies into the prevalence and predictors of nomophobia among preservice teachers are needed to better understand this phenomenon. Future research could address the limitations of the current study by recruiting a larger sample from several universities in Turkey to generalize the findings to the larger population. Doing so would help to increase the external validity of the current findings. Also, in order to draw stronger conclusions regarding gender differences in nomophobia levels, future studies should recruit gender balanced samples with equal proportion of females and males. Similarly, to better explore age-related differences in nomophobia levels, future studies should compare different age groups with broader age ranges. Additionally, future research could enhance the validity of self-reported data by incorporating objective measures of smartphone usage patterns through smartphone usage tracking applications.

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APPENDICES

A. ETHICS COMMITTEE APPROVAL

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
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02 OCAK 2018

Konu: Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

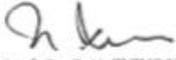
İlgi: İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Prof.Dr. Soner YILDIRIM;

Danışmanlığını yaptığımız Mehmet AKHOROZ'un " **Kişilik Özellikleri ve Düşünme İhtiyacının Telefon Bağımlılığı Üzerindeki Etkileri**" başlıklı araştırması İnsan Araştırmaları Etik Kurulu tarafından uygun görülerek gerekli onay **2017-EGT-214** protokol numarası ile **02.01.2018-30.12.2018** tarihleri arasında geçerli olmak üzere verilmiştir.

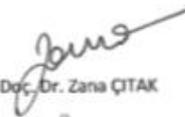
Bilgilerinize saygılarımla sunarım.


Prof. Dr. Ayhan SOL
Üye


Prof. Dr. Ş. Halil TURAN
Başkan V


Prof. Dr. Ayhan Gürbüz DEMİR
Üye


Doç. Dr. Yaşar KONBAKÇI
Üye


Doç. Dr. Zana ÇITAK
Üye


Yrd. Doç. Dr. Pınar KAYGAN
Üye


Yrd. Doç. Dr. Emre SELÇUK
Üye

B. QUESTIONNAIRE

Akıllı Telefon Kullanımı ve Kişilik Özellikleri Anketi

Değerli öğrenciler,

Biraz sonra cevaplayacağınız anket, akıllı telefonların kullanımına yönelik maddelerden oluşmaktadır. Ölçeklerdeki maddelere vereceğiniz SAMİMİ ve DOĞRU cevaplar çalışmanın güvenilirliği açısından çok önemlidir. Çalışmada kullanılan ölçek maddeleri kişisel rahatsızlık verecek bir öge içermemektedir. Hiçbir ölçek maddesinin doğru ya da yanlış cevabı yoktur. Elde edilecek bilgiler sadece bilimsel amaçlar için kullanılacak ve gizli tutulacaktır. Anket 4 bölümden oluşmakta ve tamamlamanız yaklaşık 15-20 dakika sürecektir. Çalışmaya yapacağınız değerli katkı için teşekkür ederiz. Lütfen yanıtlanmamış soru bırakmayın ve her soru için tek bir yanıt veriniz. Lütfen soruları cevaplarırken samimi cevaplar vermeye çalışınız ve sizi en iyi yansıtan cevapları seçiniz.

Şartları okudum kabul ediyorum

Q1 Bölümünüz: Evet Hayır

Q2 Yaşınız:

Q3 Cinsiyetiniz: Kadın Erkek

Q4 Lisans eğitiminizde şu an kaçınıcı sınıftasınız?

1 2 3 4 Diğer: _____

Q5 Kaç yıldır akıllı telefon kullanıyorsunuz? (Lütfen aralık seçiniz):

1 yıldan az 1 – 2 yıl 2 – 3 yıl 3 – 4 yıl 4 – 5 yıl
 5 yıl veya daha fazla

Q6 Akıllı telefonunuzdan İnternet erişiminizi sağlayan mobil veri paketiniz var mı?

Evet Hayır

Q7 "1" ifadeye kesinlikle katılmadığınızı "7" ise kesinlikle katıldığınızı göstermektedir.

Akıllı telefonun kullanımınızla ilgili olarak aşağıdaki ifadelere katılma derecenizi belirtiniz.	1	2	3	4	5	6	7
1. Akıllı telefonumdan sürekli olarak bilgiye erişemediğimde kendimi rahatsız hissederim.	()	()	()	()	()	()	()
2. Akıllı telefonumdan istediğim her an bilgiye bakamadığımda canım sıkılır.	()	()	()	()	()	()	()
3. Haberlere (örneğin neler olup bittiğine, hava durumuna ve diğer haberlere) akıllı telefonumdan ulaşamamak beni huzursuz yapar.	()	()	()	()	()	()	()
4. Akıllı telefonumu ve telefonumun özelliklerini istediğim her an kullanamadığımda rahatsız olurum.	()	()	()	()	()	()	()
5. Akıllı telefonumun şarjının bitmesinden korkarım.	()	()	()	()	()	()	()
6. Kontörüm (TL kredim) bittiğinde veya aylık kota sınırımı aştığımda paniğe kapılırım.	()	()	()	()	()	()	()
7. Telefonum çekmediğinde veya kablosuz İnternet bağlantısına erişemediğimde sürekli olarak sinyal olup olmadığını veya kablosuz erişim bağlantısı bulup bulamayacağımı kontrol ederim.	()	()	()	()	()	()	()
8. Akıllı telefonumu kullanamadığımda, bir yerlerde mahsur kalacağımdan korkarım.	()	()	()	()	()	()	()

9. Akıllı telefonuma bir süre bakamadıysam, bakmak için güçlü bir istek hissederim.	()	()	()	()	()	()	()
10. Ailemle ve/veya arkadaşlarımla hemen iletişim kuramayacağım için kaygı duyarım.	()	()	()	()	()	()	()

Eğer akıllı telefonum yanımda değilse...	1	2	3	4	5	6	7
11. Ailem ve/veya arkadaşlarımla bana ulaşamayacakları için endişelenirim.	()	()	()	()	()	()	()
12. Gelen aramaları ve mesajları alamayacağım için kendimi huzursuz hissederim.	()	()	()	()	()	()	()
13. Ailemle ve/veya arkadaşlarımla iletişim halinde olamadığım için endişelenirim.	()	()	()	()	()	()	()
14. Birinin bana ulaşmaya çalışıp çalışmadığını bilemediğim için gerilirim.	()	()	()	()	()	()	()
15. Ailem ve arkadaşlarımla olan bağlantım kesileceği için kendimi huzursuz hissederim.	()	()	()	()	()	()	()
16. Çevrimiçi kimliğimden kopacağım için gergin olurum.	()	()	()	()	()	()	()
17. Sosyal medya ve diğer çevrimiçi ağlarda güncel kalamadığım için rahatsızlık duyarım.	()	()	()	()	()	()	()
18. Bağlantılarımdan ve çevrimiçi ağlardan gelen güncelleme bildirimlerini takip edemediğim için kendimi tuhaf hissederim.	()	()	()	()	()	()	()
19. Elektronik postalarımı kontrol edemediğim için kendimi huzursuz hissederim.	()	()	()	()	()	()	()
20. Ne yapacağımı bilemiyor olacağımdan kendimi tuhaf hissederim.	()	()	()	()	()	()	()

Q8 Aşağıda sizi tanımlayan ya da tanımlamayan birçok özellik bulunmaktadır. Aşağıda verilen maddelerin her birini dikkatlice okuduktan sonra her bir maddenin size en uygun olduğunu düşündüğünüz seçeneği işaretleyerek belirtiniz.

	Hiçbir Zaman	Nadiren	Bazen	Sık sık	Her Zaman
Kendimi içine kapanık biri olarak görüyorum.	()	()	()	()	()
Kendimi genellikle güvenilir biri olarak görüyorum.	()	()	()	()	()
Kendimi yavaş hareket etme eğiliminde olan biri olarak görüyorum.	()	()	()	()	()
Kendimi rahat ve stresle başa çıkabilen biri olarak görüyorum.	()	()	()	()	()
Kendimi çok az sanatsal ilgisi olan biri olarak görüyorum.	()	()	()	()	()
Kendimi dışa dönük, sosyal biri olarak görüyorum.	()	()	()	()	()
Kendimi başkalarının hatasını bulma eğiliminde biri olarak görüyorum.	()	()	()	()	()
Kendimi bir işi tam yapacak biri olarak görüyorum.	()	()	()	()	()
Kendimi kolay sinirlenen biri olarak görüyorum.	()	()	()	()	()
Kendimi yaratıcı biri olarak görüyorum.	()	()	()	()	()

Anketimize katıldığınız için teşekkürler.

-Anketin Sonu-