

## ORIGINAL RESEARCH

# Examining the Relationships between Gender-Specific Social Network Sites (SNSs) Addiction Patterns and Student Academic Performance

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## Main Points

- Females spend much time on SNSs compared to males.
- Male students' network sizes are higher than their counterparts.
- There is no relationship between SNS addiction patterns and students' academic achievements.
- There is a correlation between SNS addiction patterns.

## Abstract

Given the widespread usage of social media and the saturation of social network sites (SNSs), many students and instructors have integrated technology into both social and educational life to enhance their learning experiences. Yet, non-educational use of social media brings drawbacks and also causes undesirable situations. Especially for young people, multi-tasking, like using SNS during their class sessions, creates cognitive disabilities as well as low academic performance. In this study, we have examined the relationships between SNS addiction patterns (SNS intensity and network size) and academic achievement (grade point average, or GPA) of 711 college students in Turkey. We have also sought to assess whether there is a correlation between gender and SNS addiction patterns. A questionnaire has been used for data collection. Our findings clearly show that the majority of our participants have used a smartphone for more than 5 years, with Instagram the app whose reputation supersedes that of other SNSs. Surprisingly, we found no significant relationship between academic success and SNS addiction patterns, though the study confirms a gender-discrepancy with regard to SNS addiction patterns. Females spend more time on SNS than males, whereas males have more online friends than do females. The reason for this disparity may derive from their different uses of SNS. Thus, further studies may concentrate on different aspects of this issue with more factual and objective data to reveal the real impact of SNS on our lives. Conclusions, suggestions, and research limitations have also been discussed.

**Keywords:** Academic achievement, gender differences, network size, SNS addiction, SNS intensity

## Introduction

Recently so many people, especially young people, suffer from addiction to the internet and complain about their inability to avoid it. According to Young (1999), there are five different types of internet addiction, namely computer addiction (i.e., video game addiction), information overload (i.e., surfing), net compulsions (i.e., online gambling, day-trading), cyber-sexual addiction (i.e., online pornography) and cyber-relationship addiction (i.e., online relationships). In response to Young (1999), Griffiths (2005)

has defined another six criteria: salience (something dominating one's whole life), mood modification (something accepted as a coping strategy), tolerance (something that gradually captures one's whole life), withdrawal symptoms (a range of physical or/and emotional disorders stemming from absence), conflict (something creating chaos in one's life), and relapse (something that one unwillingly but irresistibly uses), which operationally define the addicted behaviors.

As the internet evolves and offers numerous opportunities to inhabit one's own isolated world called

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Social Network Sites (SNS), an excess of SNSs can be related to all of Griffiths' (2005)'s six criteria in direct or indirect ways (Kuss & Griffiths, 2011). They appear as a form of addiction called SNS addiction. This addiction is located under Young's (1999) cyber-relationship category (Kuss & Griffiths, 2011) since the main reason to use SNS is to communicate and/or to check in on other people's lives. In their study, Andreassen and Pallesen (2014) have defined SNS addiction as "being overly concerned about SNSs (salience and withdrawal symptoms), driven by a strong motivation to log on to or use SNSs (mood modification), and to devote so much time (tolerance) and effort (relapse) to SNSs that it impairs other social activities, studies/job, interpersonal relationships, and/or psychological health and well-being (conflict)." If we look deeper into this description from Griffiths' perspective (2005), it can be clearly concluded that, "being overly concerned about SNSs" (referred to as salience factor), "driven by a strong motivation to log on to or use SNSs" (mood modification reason), "to devote so much time" (tolerance), whereas "devoting so much effort" can be referred as relapse, and finally consequences of SNS usage can be considered as conflict factors. SNSs are virtual communities and commonly have three unique features (Boyd & Ellison, 2007). First, SNSs are web-based-bound systems that allow their users to create unique profiles. Second, they can be used both for finding new friends and maintaining current relationships by means of offering a "friends list." Third, these platforms are designed for everyone, and the mentioned friend list can be viewed and traversed. Generally speaking, having an account on an SNSs or networking via these platforms are accepted as normal behavior in our modern world (Andreassen, 2015). Ahn (2011) has also proffered that traditional divide indicators such as parental education or internet access are no longer significant predictors of social media usage, and people invariably find new ways to get connected. However, regardless of their popularity or state-of-the-art features, the literature agrees that people who prefer online communication instead of direct conversation are considered more anxious and socially insecure (Ehrenberg et al., 2008) and also more narcissistic (La Barbera, La Paglia, & Valsavoia, 2009). Excessive use of SNSs creates some emotional problems in both personal and work environments (Moqbel & Kock, 2018). These include low subjective well-being (Meier, Reinecke, & Meltzer, 2016), feelings of worthlessness (Chou & Edge, 2012), insomnia and job loss (Karaiskos et al., 2010), excessive use of mobile phones (Salehan & Negahban, 2013; Sözbilir & Dursun, 2018), and inhibited daily life activities (Charlton, 2002). In addition to social and work life, excessive use of SNSs can also cause some problems in the educational environment since the majority of SNS users are adolescents and young adults (Andreassen et al., 2013; Pempek, Yermolayeva, & Calvert,

2009; Turel & Serenko, 2012). They tend to suffer from self-regulation (Viswanath, 2015) and "urge drive" disorders (Karaiskos et al., 2010), which drag them to a desire to always be a part of a virtual world. Overall, SNSs provide students instant pleasure, such that they have difficulty concentrating even on their daily tasks such as attending and listening to lessons, doing homework, etc. (Jacobsen & Forste, 2011).

Besides the several drawbacks from SNS addiction in our lives, there also exist specific positive effects. For instance, a study conducted with preadolescent boys has revealed that online communication is positively associated with their sense of belonging to a community and quality of friendships (Quinn & Oldmeadow, 2013). Social connection is also essential for adolescents by means of increasing their self-presentation (Fiske, 2004), social capital (Ellison, Steinfield, & Lampe, 2007), self-disclosure and communication (Steinfeld, Ellison, & Lampe, 2008), and motivation and capacity (Reeve, Deci, & Ryan, 2004). In the same line, adolescents who spend their leisure time with SNS activities show positive psychological outcomes such as the enhanced relationships with their parents (Bradley & Inglis, 2012). Using SNSs may be beneficial not only for social life but also by offering potential educational advantages, especially when the primary purpose of using the platforms is to increase the quality and effectiveness of the education. In their study, (Helou & Ab.Rahim, 2014) found that students feel optimistic about SNS and believe social media can help them to increase their academic success. Researchers had found that students use SNSs for various reasons. However, their perceptions were usually positive when using the SNSs as an educational tool (Lim & Richardson, 2016). Another study indicated that SNSs can enhance the learning experience and motivate students by making them active engage in activities (Junco, Heiberger, & Loken, 2011).

All in all, SNS addiction is an inclusive concept that has several effects on people's lives. According to Kuss and Griffiths (2011), SNS addiction has six different features-usage patterns, comorbidity, motivations, typical profiles and dependency, negative consequences, and evidence of dependence. Indeed, usage patterns divide into three sub-groups: the rate of use (SNS intensity), network size, and variety of use. For this study, we have selected usage pattern pillars, SNS intensity, and network size subgroups as indicators of SNS addiction. For the scope of the research, we focus on usage patterns and, more specifically, SNS intensity, due to the accepted importance and exploratory variables of "Intensity Scales" in the context of social-capital formation of SNSs (Steinfeld, Ellison, & Lampe, 2008). Since we believe SNS intensity and network may have high correlation rates, network size is also added into our research model. Recent studies (Marker, Gnambs, & Appel, 2018; Lau, 2017) have admitted that there is still no consensus as to whether or not those who use SNS excessively really fail academically. In addition, it is a fact that there is a gender difference in SNS usage patterns (Hargittai, 2007; Thelwall & Kousha, 2014). Thus, our research has two main objectives: (1) to find if there is a relationship between SNS addiction patterns and college students' grade point averages (GPAs), and (2) to examine whether gender has an effect on SNS addiction patterns. This study contributes to the literature by means of joining two different SNS usage patterns in one research model and examining their effects by gender.

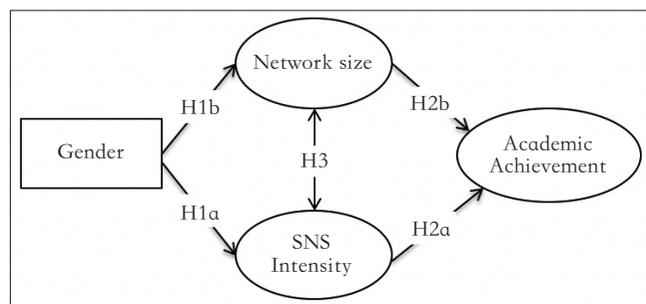


Figure 1. Research Model.

To our knowledge, this study is the first to use the “SNS intensity” scale (Salehan & Negahban, 2013) in Turkey. The paper is organized accordingly. To wit, in the second part, we have outlined the literature about SNS addiction-academic achievement and gender-SNS addiction, relatively. Finally, we have presented our results and followed them with conclusions, limitations, and future studies.

### Related Literature

As can be seen in Figure 1, our research model claims that gender has a significant effect on students’ SNS-addicted habits, which may reflect negatively on their academic achievement. To explain this issue in detail, we have conducted a broad literature review and presented our hypotheses in the following sections.

### SNS Addiction and Gender

Adolescents can spend their leisure time with various activities such as shopping, sports, hanging out with friends, surfing on the net, and playing video games. The majority of research about gender and leisure time activities indicate that both female and male adolescents do not feel willing to spend their spare time in group activities (Bradley & Inglis, 2012; Shaw, Kleiber, & Caldwell, 1995). Instead of this, males tend to be alone in their relaxing time (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2007), whereas females spend their time in individual activities and engaging in unusual experiences such as attending a hobby course or learning a new language (Passmore & French, 2001). Nevertheless, having personal spare time is the first choice for both males and females, with the process of socializing seeming more important for females (Sharp et al., 2007). Indeed, females pursue more stronger-tie activities such as posting photos, making plans and staying in touch with close friends. Males, by contrast, engage in more weaker-tie activities such as developing new relationships or looking at strangers’ profiles (Hargittai & Hsieh, 2010). The main difference between strong-tie and weak-tie activities is that the former is more related to maintaining current relationships, whereas the latter are more passing fancies.

Obviously, SNS usage and more specifically, SNS addiction, can be considered agents of socialization with gender-specific patterns. Indeed, the literature shows mixed results about SNS addiction and gender relationships. For example, one study has revealed that men typically have more friends on their friends lists (Fogel & Nehmad, 2009) and more appear as they grow more addicted (Çam & Işman, 2013). This contrasts with one of the inspiring study’s results that clearly show how women are more likely to use SNS with higher amount of frequency (Andreassen, Torbjørn, Brunborg, & Pallesen, 2012) Parallel with Andreassen et al. (2012) findings, another study has proved that online chatting causes prolonged stress for women but not for men (Thomee et al., 2007). Besides this, some studies have found no meaningful relationship between gender and SNS addiction (Koc & Gulyagci, 2013; Wu et al., 2013).

One of the leading researches conducted by Hargittai (2007) has examined if there are systematic differences between people who use SNS and those who don’t. Surprisingly, it has been admitted that none of the demographic variables (race, ethnicity and parental schooling) except for gender show any statistically significant relationship with SNS usage. According to these results, women are more likely to use SNS rather than males. The reason is that

women are more willing to engage in online communication and not want to be all alone. Supporting this research, Kolek & Saunders (2008) have examined people’s Facebook profiles in detail at a large university via quantitative content analysis. They have found that women have more Facebook accounts than men and, interestingly, women are found to be more likely to disclose personal information. A large-scale study about one of the popular SNSs called MySpace has investigated whether women are more popular in terms of having more friends and being often located at the “top friend” list (Thelwall, Wilkinson, & Uppal, 2010). In a later study, Thelwall and Kousha (2014) have admitted that due to their excellent communication skills, women become more popular on SNS compared with males. Another reason why men stay away from SNS may be caused by their relationship status. Lennon, Rentfro, and Curran (2012) have found that women, regardless of their marital status, use social media, yet married men prefer to stay away from social platforms. Barker (2009) has also stated that female students have high impulsivity to belong in a group and that’s why they prefer SNS for communication and entertainment purposes more than male students.

Although several studies have examined the gender differences in SNS usage, there is no consensus in the literature on this issue. While the majority of researchers agree that females are more likely to join SNSs (Andreassen et al., 2012; Hargittai, 2007; Kolek & Saunders, 2008; Thelwall & Kousha, 2014), a few have found that men are more willing (Çam & Işman, 2013; Fogel & Nehmad, 2009). Similarly, the literature also argues that women have more close partners than males and reciprocate their relationships in terms of being social, and/or increasing their social capital, while men generally tend to gain new friends instead of maintaining their current relationships. Thus we hypothesize that;

*H1a: Female students are more willing to use SNSs than male students.*

*H1b: Male students are more willing to have more online friends than female students.*

### SNS Addiction and Academic Achievement

Given the widespread usage of social media and the saturation of SNSs, many students and instructors have integrated technology into both social and educational life to enhance their learning experiences (Selwyn, 2010). Legaree (2015) has defined the six educational benefits of social media: (1) effective communication between learner and instructor, (2) rapid sharing of course materials, (3) 7/24 access to resources, (4) increased collaboration among students, (5) improved learning skills that may increase academic success, and (6) offering an alternative platform instead of face-to-face education. Bresciani and Schmeil (2012) have emphasized the ripple effect of social media and pointed out a variety of changes which can be gained. Twitter, one of the popular SNSs, is found to be beneficial by means of increasing students’ engagement and academic achievement since students feel more free about asking questions and making discussion on Twitter rather than in class (Junco et al., 2011). Later, Junco (2012) has found that Facebook is also useful to promote co-curricular activities, which are powerful sources in both student academic success and individual well-being. In the same line, Heiberger and Harper (2008) have found a positive correlation between time spent on Facebook and college student

engagement. Tayseer et al. (2014) indicated that SNSs could use as stress relievers. Students, also spending more time in SNSs, are more successful. In a recent study, results showed a positive correlation between SNS usage and students' academic performance (Kulidtod & Pasagui, 2017).

Despite SNSs potential gains on students' educational life, they can also cause harm that could stem from the excessive and non-educational usage of these platforms. Lau (2017) has claimed that while using SNS for academic purposes is not a predictor of academic performance, using SNS for nonacademic purposes significantly and negatively affects academic performance. Conversely, Kolek, and Saunders (2008) have not found any correlation between Facebook use and college students' GPAs. In their exploratory survey study, Kirschner and Karpinski (2010) have tried to present the relationship between Facebook use and academic performance. They have found that Facebook users and nonusers are significantly different from each other by means of their GPA reporting. Facebook users tend to have lower grades even though total time spent on the internet has nearly the same mean for both groups. In a similar vein, it is also stated that high usage of SNS is related to weak academic performance due to people overusing SNS suffering from time management problems (Othman, Apandi, & Ngah, 2017). In a recent study, based on real-time data instead of subjective evaluation, researchers have analyzed the logs of SNS apps on students' phones (Giunchiglia et al., 2018). They have found the average number of occurrences of SNS and the average time of SNS usage to be negatively related to students' GPA, whereas the average time in between SNS usage has a positive relationship with students' academic performance.

In addition to contradictory results about whether SNS usage has a positive (Kulidtod & Pasagui, 2017; Tayseer et al., 2014) or negative impact (Owusu-Acheaw & Larson, 2015; Paul, Baker, & Cochran, 2012; San Miguel, 2009) on students' academic achievement, there also exist some other studies which have found no statistically meaningful relationship between the two variables (Ahmed & Qazi, 2011; Hargittai & Hsieh, 2010; Kalra, Manani, & Pradesh, 2013; Kolek & Saunders, 2008; Negussie & Ketema, 2014; Pasek, More, & Hargittai, 2009; Sharma, 2015). However, generally speaking, literature agrees that multi-tasking with any kind of technology such as mobile phones, computers, and, more specifically, SNSs, affect the learning process negatively (Kirschner & Karpinski, 2010; Lau, 2017; Rosen, Carrier, & Cheever, 2013). Ophir, Nass, and Wagner (2009) have found that overuse of social media and multitasking lead to cognitive control disabilities in adolescents. Fox, Rosen, and Crawford (2008) have proved that college students who continue to use instant messaging during reading comprehension test completed their tasks in a more extended period and also get lower grades from the test. Since we believe that the majority of our samples use their mobile phones and deal with their SNS profiles during the lessons and keep it on during studying, we hypothesize that:

*H2a: SNS intensity is negatively associated with students' academic success.*

*H2b: Network size is negatively associated with students' academic success.*

### **SNS Intensity and Network Size**

Early studies about communication and its boundaries have indicated that the size of individuals' networks shows the reverse effect on daily life on conversation intensity. This means that individuals who have larger network size are likely to spare less time to their friends than who have smaller network sizes because of time constraints (Mayhew & Levinger, 1976). However, recent studies' have presented that network size and interaction time limitations no longer exist due to the advance of SNSs and anywhere/anytime connection opportunities (Manago et al., 2012; Yau et al., 2018). Even though, as Croom et al. (2016) have indicated that Facebook users in their study have trouble identifying most of their friends on their friends list, Burke and Kraut (2014) have found that users have tended to feel closer to their friends even if their interactions are limited or even do not exist. Thus, it can be concluded that SNSs can offer users the chance to gain more friends but not guarantee the quality of their relations.

Kleck et al. (2007) have revealed that different numbers of friends on SNSs leads to different social judgments. For example, if someone has more friends when compared to his/her friends that he/she can be readily accepted as more accessible, pleasant, and confident. Other popular research (Tong et al., 2008) has drawn attention to the existence of a curvilinear relationship between the number of friends and others' perceptions about it. Although they have not found any relationships between the perceived physical attractiveness and number of friends, they have declared that the profiles with fewest friends are perceived as less socially attractive. Thus, one can easily speculate that people may want to engage more with SNSs to increase their social capital and enhance social bonds. From this perspective, there have been some attempts to examine the relationship between the frequency of SNS usage and network size. From a social capital theory perspective, online social interaction ties have been found to positively influence SNS addiction (Yang, Liu, & Wei, 2016). One plausible reason is that users with more friends on their list have frequent communication and spend a lot of time with their networks. Similar to this line, Salehan and Negahban (2013) have found a positive relationship between network size and SNS intensity. According to them, there are two possible reasons, to explain this relation: First, as people form larger network circles, the number of people they communicate with also increases, which leads to higher SNS intensity. Second, larger network size causes a high level of information disclosure which means that people who have more friends are more likely to be more active on SNSs. Similar with this line, Klingensmith (2010) has also admitted that friend sickness (concern for the loss of current friends) is positively related to Facebook addiction, which means that people tend to meet new friends on SNSs to enhance their belongingness and social identity feelings. Another study has also investigated the mediating role of a number of friends on Facebook in the relationship between Facebook addiction and found a positive relationship among them (Rashid, Ahmed, & Hossain, 2019). We also believe that college students are willing to gain more friends on SNSs and spend a lot of time on these platforms to increase their popularity, self-identity, or other positive feelings. Therefore, we have expected to find a strong relationship between students' network size and SNS intensity. Hence, we hypothesize that:

*H3: There is a positive correlation between network size and SNS intensity.*

## Methods

### Procedure and Participants

This study was based on a convenience sampling method via face to face questionnaire technique. While this sampling method may not guarantee the representativeness of the universe, it seems the most convenient approach to reach all the possible business students at universities. The reason why we focus on university students is that almost all of them have smartphones and use SNSs actively. Over an eight-week period, 839 paper-based surveys were distributed to two different universities (Sakarya University and Bandırma Onyedi Eylül University) in Turkey during the first semester of the 2017/2018 academic year. The questionnaires were administered only in business schools. Before completing the survey, a brief explanation, consisting of our research purpose and assurance to volunteers that data collection, evaluation, and analysis would only be discretely used for scientific purposes. To attract more students, a gift coupon from Idefix, a favorite online book store, was also offered. A survey took about approximately 7 – 10 minutes to complete. First, participants were asked about their demographic characteristics such as gender, grade (on 4-point scale), studying department, duration of their smart-

phone use and their favorite SNS app, which are summarized in Table 1. Later, they were given two groups of questions about their academic success and SNS intensity.

Among the 839 surveys, 737 of them were usable. In examining for outliers and missing data for GPA, 24 cases were missing. Some students claimed not to have a GPA due to hesitating to declare their academic success. Thus, these missing cases were excluded from our dataset. In addition to that, 2 overrated network sizes-10,000 and 17,000-were detected and also excluded our dataset. Finally, we got 711 usable surveys.

### Measures

We adopted our five Likert-type SNS Intensity Scale which is shown in Appendix 1, from Ellison, Steinfield, & Lampe's (2007) study which also led to Salehan and Negahban (2013) research. This scale consists of five questions, like "I check my social networking site(s) almost every day" to reveal the duration of SNS use, and "I feel out of touch when I haven't logged onto my social networking site(s) for a day" to highlight the behavioral side. Since SNS intensity relates not only to usage frequency but also to the behavioral and emotional attitudes towards social media (Ellison et al., 2007), this scale matches well with the aim of our scope. To measure network size, we focus on social-network size rather than total-network size of the person, which includes both offline and online connections. We just asked our respondents to write their total number of friends or followers on their favorite app. For academic achievement, we asked our participants to write their GPA. The GPA scale ranged from 0 to 4.

## Results

Participants' demographic experiences were presented in Table 1. The majority of the students were female (60.9%), third class and department of Human Resource Management (HRM) students.

Before multivariate statistics, the Normality Test of Kolmogorov Smirnov and Shapiro Wilks have been performed. Total number of followers and aggregate score of network intensity reveal non-normal distribution (Shapiro Wilk's Statistics=0.691, df=673 and p=0.000 for number of followers and Statistics=0.990, df=673 and p=0.000 for aggregate score of network intensity). However, grade point average (GPA) score of participants have revealed normal distribution. Statistics=0.997, df=673 and p=0.364). In the next phase, we investigated the relationships among the academic success of participant students' measured by GPA scores, the intensity of involvement to social media platforms measured by a number of followers, and the intensity of individual activities on social media platforms measured as the aggregated scores of SNS intensity of individual items. Since all the measures involve continuous variables, we calculated Pearson and Spearman Correlation Coefficients to assess the relationships among these three variables as presented in Table 2 below, inasmuch as there are non-normality issues.

Only the correlation between the number of followers and SNS intensity scores are significant at the 5% significance level (p=0.01), both in parametric and non-parametric correlation tests. Correlation coefficient has turned out to be positive (0.097 and 0.140 respectively for parametric and non-parametric tests) and rather

**Table 1.**

### *Participants' Demographic Experiences*

Characteristics		N	%
Gender	Male	278	39.1
	Female	433	60.9
Grade	1	196	27.6
	2	197	27.7
	3	250	35.2
	4	68	9.6
Department	Business Administration	146	20.5
	Human Resource Management	220	30.9
	Management Information Systems	114	16.0
	Health Management	185	26.0
	International Trade	46	6.5
How many years do you use a smartphone	<1 year	7	1.0
	1-3 years	65	9.1
	3-5 years	207	29.1
	>5 years	432	60.8
Favorite SNS	Facebook	41	5.8
	Instagram	566	79.6
	Snapchat	4	0.6
	LinkedIn	4	0.6
	Twitter	53	7.5
	Others	43	6.0

SNS: social network site.

low, yet significant. It seems individuals' usage frequency enhances along with their number of followers or vice versa. So we can conclude that our H3 hypothesis has been verified. Other variables included in our analysis, namely number of followers, GPA and SNS intensity score and GPA, are not significantly related. Hence, we have failed to prove our H2a and H2b hypotheses, since we couldn't manage to prove the negative relationship between GPA and SNS addiction patterns that may be caused by the similarity of GPA average scores for females and males, 2.37 and 2.19, respectively.

**Table 2.**  
*Correlation Coefficients*

		GPA	Number of Followers	SNS Intensity Score
GPA	Pearson Correlation	1	-0.007	0.024
	Sig. (2-tailed)		0.857	0.521
	N	711	711	711
Number of Followers	Pearson Correlation	-0.007	1	0.097*
	Sig. (2-tailed)	0.857		0.010
	N	711	717	717
SNS Intensity Score	Pearson Correlation	0.024	0.097*	1
	Sig. (2-tailed)	0.521	0.010	
	N	711	711	711
GPA	Spearman rho	1	-0.048	-0.012
	Sig. (2-tailed)	-	0.214	0.754
	N	707	673	707
Number of Followers	Spearman rho	-0.048	1	0.140*
	Sig. (2-tailed)	0.214	-	0.000
	N	673	697	697
SNS Intensity Score	Spearman rho	-0.012	0.140*	1
	Sig. (2-tailed)	0.754	0.000	-
	N	707	697	734

GPA: grade point average; SNS: social network size; Sig: significance.

**Table 3.**  
*Gender Differences in SNS Intensity and Network size*

Gender	M for SNS intensity	SD for SNS Intensity	t	p
Males	2.8657	0.81671	-3.155	0.002*
Females	3.0479	0.72456		
	M for Network Size	SD for Network Size	t	p
Males	513.6506	706.83584	2.023	0.043**
Females	410.8795	623.43271		

\*p<0.01; \*\* p<0.05; M: mean; SD: standard deviation.

In order to test the gender differences in SNS intensity and network size, we aggregated five individual items to measure SNS scale in our instrument with simple arithmetic mean. We run nonparametric correspondence of independent sample t-test and Mann Whitney U test, respectively, for the total number of followers and aggregate network intensity based on categorical variable gender. For both of the dependent variables, we got significant results of p values of 0.002 and 0.043, respectively. Hence, we found significant differences in respondents' number of followers and aggregate (mean) value of network intensity between males and females. The results are presented in Table 3 below.

Based on the analysis above, we could observe that females seem to use SNSs more frequently than males. Average SNS intensity scores for females and males respectively are 3,0479 and 2,8657, and the mean difference in these average scores are highly significant at 1% significance level (p=0.002). Hence we accept the H1a hypothesis and observe the differences between genders in terms of SNS usage frequency pattern. In response to our H2b hypothesis, we can conclude that males have more friends on SNSs than females (513.6506 and 410.8795) and this difference indicates statistically significant difference at 5% significance level (p=0.043). Thus, we also accept our H2b hypothesis. Since normality assumption has largely been violated, we prefer not to perform the regression analysis test.

### Discussion

Meena et al. (2015) have pointed out with regard to SNS addiction, the majority of people do not realize how much time they spend on these platforms and its possible adverse effects on their life, nor what makes this condition an addiction. This study has examined whether there are meaningful relationships between selected SNS addiction patterns and students' academic success. In addition, we have also investigated the gender effect on selected SNS addiction patterns. According to our general findings, the vast number of participants have admitted that they have used their smartphone for more than five years. Only seven students claimed that they started to use a smartphone for less than one year. Literature has suggested that the duration of smartphone ownership has a significant positive impact on smartphone addiction (Gezgin, 2018). The same study has also found a positive relationship between smartphone addiction and daily duration of SNS use. This means that students who have used smartphones longer also tend to use SNS heavier. This finding was necessary for the aim of our research since the majority of our samples have used their smartphones for more than five years and expected

to more willingly to join SNSs frequently. Surprisingly but also somewhat expectedly, Instagram was found to be the most popular SNS among Turkish college students, parallel with its growing interest (Statista, 2019). Notwithstanding the widespread acceptance of Facebook all around the world with 2.5 billion active users, it has admitted that young people have started to move into another social media platforms (Sweeney & De Liz, 2018). Researchers have stated that Instagram has focused on more of a niche area than Facebook and offered a more creative and straightforward photo-sharing platform (Lee et al., 2015), which motivates people to be more active and engaging with others (Bakhshi, Shamma, & Gilbert, 2014; Sheldon & Bryant, 2016). In the following section, our hypotheses are going to be discussed based on the results above.

#### **Female Students are More Willing to use SNSs Rather than Male Students**

It has been reported that there is a significant positive relationship between gender and SNS intensity at a level of 0.05 ( $p=0.002$ ). It seems females spend much time on SNSs compared to males. This result shows similarity with the previous research in the literature. Basically, some researchers (Andreassen et al., 2012; Bányai et al., 2017; Frison & Eggermont, 2016; Phu & Gow, 2019) have made attempts to examine the relationship between gender differences and SNS intensity and proved that women are more likely to use SNS at a higher rate. Denti et al. (2012) have also admitted that women are more inclined to stay online. A recent study has revealed that females are more willing to spend much more time on Facebook, and their Facebook intensity appears higher in every aspect compared to males (Phu & Gow, 2019). Mariko Kasahara (2017) has also stated that females are more likely to post. Parallel with Andreassen et al. (2012) study, Hormes, Kearns, and Timko (2014) have reported women to show greater overall craving tendency for Facebook such as checking their profiles first thing in the morning or feeling the necessity to decrease time spent on Facebook. In a similar line, Muhammad, Zhao and Liu (2019) have investigated gender-based human check-in behavior by using density maps and found females to be more willing to share their locations than men. Another interesting study (Litchfield & Kavanagh, 2019) has focused on gender representation on SNS by means of analyzing Olympic teams' sports stories and images posting. They have claimed that women make progress in terms of the number of shared posts on online platforms. There are some possible reasons to explain why females are more likely to use SNSs than males. In her research, Hargittai (2007) has admitted that women tend to waste their spare time on SNSs because of their monophobia and a strong need for person-to-person communication. According to Thelwall and Kousha (2014), women have enhanced communication skills that entail them being more active on SNSs and making them more popular among their counterparts. Przepiorka, Blachnio, and Diaz-Morales (2016) have found that females have a great tendency to put off making decisions, which cause high Facebook intensity and intrusion. A national-level study called "Sweden's Largest Facebook Study" has revealed that although men and women have different motives for using SNSs, women ascribe more meaning to social media which makes them more addicted (Denti et al., 2012) and drugs them into prolonged stress (Thomé, Eklöf, Gustafsson, Nilsson, & Hagberg, 2007).

#### **Male Students are More Willing to Have More Friends than Female Students**

This study has determined that male students' network sizes are higher than their counterparts, which difference is statistically meaningful at the level of 0,05 ( $p=0.043$ ). This finding is also supported by previous research (Raacke & Bonds-Raacke, 2008; Rana, Ahmed & Hossain, 2016; Rashid, Ahmed, & Hossai, 2019). Fogel and Nehmad (2009) study's results are also consistent with ours. According to them, women avoid adding strangers to their lists as friends, since they give more importance to their privacy issues. They might also be more afraid of stalking and of coming up against men's sexual approaches. It has also proved that men feel more comfortable about disclosing their personal information and spend more time "instant messaging" than women (Chung & Soo Nam, 2007). Another reason to explain this phenomenon may arise from the use of social media for different purposes. Denti et al. (2012) have offered that women generally show dependency on SNSs to maintain their relationships, whereas men generally prefer to use them for hobby and entertainment. Tartory, 2019 has also found significant communication differences between females and males by means of using Facebook. In this study, it has been ascertained that females are eager to use SNS to interact with their colleagues, friends, and family. Likewise, Hargittai and Hsieh (2010) have also proved that women tend to create more stronger-tie activities compared to men on social media. Mazman and Usluel (2011) have agreed and found that males have more friends on Facebook. That's why their main intention is to find new relationships or friends but not related to any academic or information-seeking purposes as well. Contrary to these assumptions, in their large scale of gender-specific multiplex network study, Szell & Thurner (2013) have suggested women are more inclined to developed reciprocal positive behaviors and thus more communication partners. However, we believe that if women are expected to see a positive feedback from their friends, then it is better to communicate their close friends instead of creating new ones.

#### **SNS Addiction Patterns (SNS Intensity and Network Size) are Negatively Associated with Students' Academic Success**

Although we have expected to find out a negative relationship between SNS addiction patterns and students' academic achievement, the reason why multi-tasking leads to low performance and task distraction (Benson, Hand, & Hartshorne, 2019; Rosen, Carrier, & Cheever, 2013; Lau, 2017), surprisingly we have failed to prove our hypotheses at the level of 0.05 ( $p=0.754$  and  $p=0.214$ , respectively). Actually, in our technology age, it is not simple to say that social media harms people and affects their life negatively. Hemsley et al. (2018) critically explore whether social media is an evil or a good thing. They have concluded that answering this question depends on where you stand. For the scope of this study, this means that the general belief about the negative consequences of SNSs on academic performance is not valid for a sample of Turkish students. One plausible reason to explain this unexpected result is that students manage their time effectively and fulfill their requirements, so high level of SNS usage nor network size have no impact on their performance (Ahmed & Qazi, 2011). Another possible reason may arise from the routine use of SNSs among young people and their prolific habits towards these platforms (Ahn, 2011). Similar with these findings, Hargittai and Hsieh (2010) has also found no significant relationship

between GPA and SNS usage, the reason why SNSs could support and detract from academic works. A recent study's results have revealed that the SNS addiction rate is 70.7% among young adults and adolescents (Raj, Bhattacharjee, & Mukherjee, 2018). In his popular reviewing study, Ahn (2011) has also noted that technology alone is not likely to affect students' grades. There are also some other social, psychological and environmental factors that must take into account. Consequently, SNS addiction patterns have not shown any significant effect on students' academic performance in our study, that's why the gap between the virtual and real world is increasingly blurred for young people day by day (Subrahmanyam & Greenfield, 2008). We can conclude that students participating in our study may be aware of their responsibilities and have accepted SNSs as a part of their lives.

### There is a Positive Correlation between Network Size and SNS Intensity

We found a positive, yet the partially weak relationship between network size and SNS intensity ( $r=0.140$ ,  $p=0.00$ ) at the 5 percent significance level. This means that people get more connected to SNSs as their network size increases or vice versa. This positive relation has been echoed in the findings of other researchers. Salehan and Negahban (2013) have admitted people who get larger network cycle are more willing to spend their time on SNSs. Another study has also found a mediating relationship between a number of friends and Facebook addiction (Rashid, Ahmed, & Hossain, 2019). However, we have also proved this correlation; the significance level is lower than what we have expected. It seems there may be other variables that must be taken into account to explain this relationship.

### Limitations and Directions

Our study has several limitations that should be acknowledged. First of all, we have used convenience sampling, and our sample is not representative of all student population in Turkey. Studies with broader participation should be carried out to find more generalizable results. Second, we have chosen SNS intensity and network size as the patterns of SNS addiction. However, there is also another variable called a variety of usage. Thus, we have recommended building more comprehensive research models to address the issue in more detail. Third and the most significant limitation of our study is about the measurement of SNS intensity. We have used self-reported survey technique and asked people some questions like how frequent they use SNS or how they feel when they use SNS. Since literature has suggested people generally under the risk of misunderstanding of their time spend when they use a mobile phone and misinterpreting the spending time on SNS (Lin et al., 2015), using their perceived intensity opinions may not be entirely true. We suggest that further researchers should focus on more reliable and real-time data that can be accessed from individuals' phones or their log records with their permissions. Fourth, the original language of the SNS Intensity Scale is English, yet we modify to some extent the items into the Turkish language. However, in future studies, validity and reliability measurements of the used scale shall be carried out. Consequently, this study highlights the relationship between two different SNS addiction patterns and gender. The result of our study shows that females have a high tendency to use SNSs, whereas males have more friends when compared to each other. This proves that although women have spent much time on social

media and feel more connected to this virtual world, they are not willing to gain more friends like their counterparts do. In our further studies, we have asked participants why they use social media and what their purposes are to explain this finding in more detail.

**Ethics Committee Approval:** Ethics committee approval was received for this study from the ethics committee of Sakarya University (date: 2019; no: 6192333/050.99/).

**Informed Consent:** Verbal informed consent was obtained from students who participated in this study.

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**Appendix 1. SNS Intensity Scale (Salehan & Negahban, 2013)**

SNS\_1: Visiting social networking sites is part of my everyday activity.

SNS\_2: I check my social networking site(s) almost every day.

SNS\_3: I feel out of touch when I haven't logged onto my social networking site(s) for a day.

SNS\_4: I feel I am part of the community of my social networking site at the campus.

SNS\_5: I would be sorry if my social networking site shuts down.