

Relationship between Problematic Smartphone Use and Social Anxiety Among University Students: A Case of United States International University- Africa

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Abstract

The purpose of this study was to establish the relationship between problematic smartphone use and social anxiety among United States International University-Africa students, Kenya. A total of 106 students were selected via convenience sampling comprising of 68.9% females (N = 73) and 31.1% males (N = 33). The average age of the entire respondents was $28 \pm (SD: 0.59)$. The theoretical framework was based on Self-determination theory and descriptive correlational design was the research methodological design. To measure problematic smartphone use (PSU), smartphone addiction scale-short version (SAS-SV) was adopted whilst social anxiety scale (SIAS) was used to measure social anxiety. Result of the study indicated that 58.5% of the university students had moderate levels of PSU, 30.2% had low PSU, 9.4 % high PSU and only 1.9% indicated no presence of PSU. For social anxiety, 17% had high symptoms of social anxiety, 6.6% moderate, and 76.4% low symptoms of social anxiety. Pearson correlation test was used to determine the relationship between the variables and the findings revealed that there was a statistically significant positive correlation ($r = 0.222$, $P = 0.02$) between problematic smartphone use and social anxiety among students. This study concludes that there was a relationship between problematic smartphone use and social anxiety among university students. Findings therefore highlighted the need for early intervention to reduce problematic smartphone use and social anxiety among university students.

Keywords: Problematic smartphone use, social anxiety, gender difference, university students, positive relationship, smartphone addiction, mobile phone use, cell phone

Introduction and Background

Worldwide, most individuals who own smartphones are young people between 18-34 years old (Taylor & Silver, 2019). According to Erikson's psychosocial stages of development, the age between 18-34 years is the prime stage where young adults struggle to achieve a sense of belonging by forming close relationships and those who are not successful end up being isolated (Erik, 1984). Subsequently, Wang et al., (2017) alluded that the need for belonging among the

adolescent is positively associated with problematic phone use. This could be because most young people use smartphone social networking sites more often to connect with friends. Studies have shown that lack of social networks and peer supports have the likelihood of increasing smartphone use (Ihm, 2018; Kim et al., 2017). This is because people tend to find alternative platform for engagement through smartphone whenever they miss other persons around them. The individuals may access different applications available on smartphone such as movies apps or social networking sites such as Facebook for interaction. Previous studies have added that excessive use of smartphones interferes with interpersonal communication and face-to-face communication (Chiu, 2014; Chotpitayasunondh, & Douglas, 2016). In other situations, fear and worry of being criticized or evaluated by others in social situations would to some extent increase the vulnerability to frequent use of smartphone (Eichenberg, Schott, & Sindelar, 2017).

Smartphone has grown beyond its use as a communication gadget to include the provision of entertainment, information, productivity enhancement, and social interaction, among other factors (van Deursen et al., 2015). Statista (2020) estimated that the global smartphone usage is over 3 billion in 2018, with China leading in smartphone usage with over 850 million users. According to Global System for Mobile Communication (GSMA) (2019) Sub-Saharan Africa had an estimate of 456 million mobile subscribers, with 23% of the African population using mobile internet on regular basis. South Africa leads with an estimate of 91% mobile phone ownership followed by Ghana 80%, and Senegal 79% (Taylor & Silver, 2019). A study done among South African University students found signs of smartphone addiction (North, Johnson, & Ophoff, 2014). The study further showed that there was gender difference in mobile phone use with females showing an increased smartphone use for safety and socializing, interest in brand and trends, as well as signs of addiction. In a study done among young people in South West Nigeria, it was established that there was prevalence and positive relationship between depression, anxiety and smart phone addiction (Ayandele et al., 2019). Similarly, Akpunne and Akinnawo (2018) found that 32.3% had moderate PSU and 15.1% severe PSU whilst 34.5% had moderate anxiety and 16.1% had severe anxiety. The study was carried out among 854 undergraduate students from Redeemer's University in Nigeria. In Egypt, a study carried out among 1380 undergraduate students using SAS-SV and Beck anxiety inventory reported that 59% of the respondents were addicted to smartphones (Okasha et al., 2021). The study further indicated a significant relationship between smartphone addiction and anxiety. In Kenya, it was estimated that mobile-

cellular subscription was 49.5 million by 2018 (Statista, 2020). Moreover, 41% of adults in Kenya reported owning a smartphone while 45% own other cellphones (Taylor & Silvia, 2019). In terms of age distribution, young people between 18-34 years old own 51% of the smartphones in Kenya, between 35-49 years old own 27% and individuals above 50 years old own 18% (Silver, 2019). Kaniaru, Karani and Waithera (2020) found a significant relationship between nomophobia and problematic smartphone use in a quasi-experiment among 811 nursing students in Western Kenya.

Problematic smartphone use (PSU) has been conceptualized to involve the excessive use of a smartphone, leading to social or occupational functional impairment, and including dependence and symptoms seen in addictive disorders, such as withdrawal and tolerance (Billieux, et al., 2015; Clayton et al., 2015). It is argued that problematic smartphone use manifests itself in the same manner as other technology-based addictions such as internet, gaming, and computer addictions (Kim, 2013). However, this definition has not been added to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) because there are still ongoing debates on whether to consider problematic smartphone use or smartphone addiction as a behavioral addiction or not. The emergence of technology has led to recognition of addiction to not only involve drug and substance abuse but also behavioral addiction (Clay et al., 2015; Yu & Sussman, 2019). According to American psychological association (APA) (2013), gambling addiction as described in the DSM-5 is considered as non-substance related disorder and internet gaming disorder is listed as problematic behavioral disorder pending further studies. In consideration of the fact that problematic smartphone use is not included in DSM-5 as an addiction disorder, several studies have shown that symptoms of problematic smartphone use are analogous with symptoms of substance-use disorder as listed in the DSM-5. These include tolerance, impairment of daily functioning, preoccupation, disregard to harmful consequences, and withdrawal symptoms such as irritability (Lee et al., 2018; Yu, & Sussman, 2019). The difference is that the internet gaming disorder might be restricted to a stationed device such as a desktop computer or laptop but smartphone is a highly portable device. Therefore, the accessibility and portability of smartphones has resulted to continuous access to internet without the restriction of time or geographical location. This increases the vulnerability to problematic overuse of smartphone applications, games, and social networking site interactions (Yu, & Sussman, 2019).

Parasuraman et al., (2017) added that behavioral addictive symptoms such as withdrawal and craving for smartphone may result to increased anger, reduced work efficacy, tension, depression, irritability, difficulty of control, stress, mood change and restlessness if the phone is not easily available. Technologically, Taneja (2014) indicated that due to problematic smartphone use, there are new pathological terms that have emerged such as Nomophobia, which means No-MobilePhobia, FOMO [Fear Of Missing Out] or the fear of being without a cell phone, disconnected or off the Internet, Textaphrenia and Ringxiety- the false sensation of having received a text message or call that leads to constantly checking the device, and Textiety – the anxiety of receiving and responding immediately to text messages. Several recent studies have shown that problematic smartphone use among young people have resulted to both physical and psychological health problems which may include rigidity and muscle pain, ocular afflictions resulting from Computer Vision Syndrome reflected in fatigue, dryness, blurry vision, irritation, or ocular redness (Aggarwal, 2013; Choi et al., 2015). Other health issues include weakness of thumb and wrist, neck pain and rigidity, increased frequency of De Quervain's tenosynovitis, tactile hallucinations, nomophobia, insecurity, delusions, auditory sleep disturbances, insomnia, hallucinations, lower self-confidence, and mobile phone addiction disorders (Peraman & Parasuraman, 2016). Additionally, Coughlan (2019) reported that almost a quarter of young people in Britain are dependent on their smartphone and when denied constant access to their phone, they become anxious or upset. Similarly, Kershaw (2019) showed that one in four children in the United Kingdom has problematic smartphone usage. In the United States, 81% of the Americans own a smartphone and 96% of them are individuals between 18 to 29 years old (Taylor & Silver, 2019). Admittedly, 46% of smartphone owners in US accepted that they could not live without their phones indicating the dependency or over reliance on smartphones (Pew Research Center, 2015).

Social anxiety is described as severe and persistent fear of social interactions and situations that involve the possibility of an individual being scrutinized such as in public speaking, meeting unfamiliar people, eating or drinking in public (Davey, 2014). In relation to DSM-5 key criteria for social anxiety disorder include: Distinct fear or anxiety about one or more social situations in which the person is exposed to possible scrutiny with the concern of being negatively evaluated; Social situations provoke fear or anxiety; the avoidance, fear or anxiety often lasts for 6 or more months and cause significant distress or impairment in social, occupational, or avoidance but not

attributed to physiological effects of a substance or another medical condition; The fear, anxiety, or avoidance cannot be explained by the effects of other mental or medical disorders, drug or medication (APA, 2013). It is approximated that the global population of people suffering from anxiety disorder was 264 million, with Africa accounting for 10% of that population (WHO, 2017). Despite having insufficient evidenced-based data on people with anxiety disorders in Kenya, the Ministry of health (2015) reported that about 25% of outpatient and 40% of inpatients in various health facilities in Kenya are suffering from mental health illness. In relation to smartphone use, the capability of smartphones to provide internet services has increased the use of smartphones for online social interactions among most smartphone owners. Fehm et al. (2005) argued that fear and worry of being criticized or evaluated by others in social situations may make individuals to prefer an environment in which they can reveal themselves better without being judged or scrutinized. Bonetti, Campbell and Gilmore (2010) added that online social interaction and communication may be sought as a potential environment for escape. The need for alternative environment for escape may lead to frequent internet usage and eventual problematic phone use (Eichenberg et al., 2017). A cross-sectional study carried out among 198 students from University of Garmian, Iraq, showed that 20.2% had mild social anxiety disorder, 41.9% moderate SAD, and 28.3% had severe SAD (Ahmad, Faque, & Seidi, 2017). In another cross-sectional study conducted among 476 undergraduate students from Jaza University in Saudi Arabia, 25.8% of the participants showed symptoms of SAD (Hakami et al., 2017). Specifically, of the students who tested positive for SAD, 47.2% of the students had mild symptoms, 42.3% had moderate symptoms, and 10.5% had severe to very severe symptoms of SAD. Using a social phobia inventory scale to determine prevalence of social anxiety disorder among 503 university students from Gondar Ethiopia, Desalegn, Getinet, and Tadie (2019) established that 16.7% of the students had mild social phobia, 9.3% had moderate level of social anxiety, 3.8%, and 1.39% had severe and very severe levels, respectively.

A previous study has established a bidirectional relationship between smartphone use and anxiety severity, and vice-versa (van Deursen et al., 2015). Moreover, Jeong, Suh, and Gweon (2020) found a significant correlation between smartphone addiction and five psychological factors such as depression, anxiety, self-control, life satisfaction, and aggression, thereby postulating that individuals with psychological problems were more vulnerable to technology-based addiction including problematic smartphone use. A study done among 432 junior 1 to senior year 3

students in Hunan province of China, Ren, Yang and Liu (2017) found that there was a significant positive correlation $r = 0.385$ between anxiety and internet addiction. A similar finding was revealed by Sertbaş et al., (2020) in their study with 297 University students in Turkey which established a positive significant correlation $r = 0.34$ between social anxiety and problematic internet use. Bun Lee (2015) in a survey study with 276 African American students found that social anxiety was an independent positive predictor of smartphone addiction. A similar finding was established by Darcin et al., (2016) in their study with 367 students from a Turkish university. In another empirical study conducted with 296 college student in the United States, Elhai, Tiamiyu, and Weeks (2018) established a statistically significant positive correlation ($r = 0.22$, $p < 0.001$) between problematic smartphone use and social anxiety, implying that when problematic smartphone use increases, social anxiety also increases. Moreover, Hussain, Griffiths and Sheffield (2017) in their online survey targeting 640 respondents in United Kingdom established a positive relationship ($r = 0.22$, $p = 0.01$) between problematic smartphone use and anxiety. In addition, the study indicated that there was significant negative relationship ($r = -0.22$, $p = 0.01$) between problematic smartphone use and age of the respondents. Using Beck's anxiety inventory to determine the relationship between smartphone severity use and anxiety among 319 university students from Turkey, the study showed that there was significant positive correlation ($r = 0.276$, $p < 0.001$) between smartphone severity use and anxiety (Demirci, Akgonul & Akpınar, 2015). A previous study by Masiu and Chukwuere (2018) established that most students from South African Universities were using smartphones for academic progress and to improve their social networking. Leung and Lee (2012) on the other hand argued that the repetitive behaviors of smartphone use irrespective of the intentions are likely to lead into PSU and isolation from social environment. However, most studies done in Kenya in relation to smartphone are mainly in relation to the use of smartphones for medical services, business, or for academic purposes (Bakibinga et al., 2017; Krell et al., 2020; Njuguna, et al., 2014). Evidently, there seems to be limited empirical literature in Kenya focusing on problematic phone use and mental disorders such as social anxiety. Therefore, this study sought to establish whether there was relationship between problematic phone use and social anxiety among university students at United States International university- Africa.

Methodology

A descriptive correlational research design was used in conducting the research. This study was conducted within United States International University- Africa, which is a private University with dual accreditation located about 14 km from the central business district of Nairobi County, Kenya. The respondents were from the School of Humanities and Social sciences. Purposive sampling was used to select the school of study whilst convenience sampling was used to select the students. According to Etikan, Musa and Alkassim (2016) purposive sampling is a nonprobability sampling method where the subject or participants of the study are selected based on the quality they possess. On the hand, Convenience sampling is a nonrandom sampling method where the participants are selected based on the ease of accessibility, availability or the willingness to be involved in the study. Cochran formula was used to calculate the sample size of 112 but the final respondents were 106 students. For one to be included in the study he/she must have been a student in USIU-A from the School of Humanities and Social Science, must have had a smartphone for the last six months, and aged between 18- 40 years. The researcher used a researcher generated socio-demographic questionnaire and standard tools for data collection. Socio-demographic questionnaire was used to obtain information on age, gender, and the current year of study in the university.

To measure problematic smartphone use, Smartphone Addiction Scale – Short Version [SAS-SV] (Kwon, Lee et al., 2013) was used. The SAS-SV is a shorter, 10-item version of the SAS. The SAS-SV contains 10 items, each scores on a Likert scale of 1(strongly disagree) to 4(strongly agree).The scoring of these items gives an overall SAS-SV score (range: 10–40) with higher scores indicating PSU. A score less than 10 shows no problem with PSU, a score between 11-20 indicates low levels of PSU, between 21-30 scores indicate moderate levels and a score between 31-40 shows problem with PSU. The study found internal consistency reliability for SAS-SV Cronbach's alpha 0.847. Previous studies also found SAS-SV to have a good reliability of Cronbach's alpha 0.844 and good psychometric property including validity (Hawi & Samaha, 2017; Lopez-Fernandez, 2017).

Social Interaction Anxiety Scale (SIAS) by Mattick and Clarkes (1998) was used to measure social anxiety. The instrument has been used to assess prevalence, severity, and treatment outcomes of social phobia and social anxiety disorder. SIAS is a 20 item scale with response

option ranging from 0 = not at all characteristic or true of me to 4 = extremely characteristic of me or true of me. However, the scoring of items 5, 9, and 11 rating are reversed. The interpretation of the scores shows that the total scores is 80 and a score from less than 33 indicate low effect of social phobia or social anxiety, 34 or more indicative of social phobia or moderate social anxiety, and 43 or more implies presence of severe social anxiety disorder. SIAS has been reported to have high internal consistency with a coefficient alpha of 0.93 (Mattick & Clarkes, 1998; Rodebaugh et al., 2007). This study established internal consistency reliability of 0.952 for SIAS after the pre-test and good content and face validity.

The administration of the research instrument was undertaken in consideration of the restriction of movement due to Covid-19 pandemic and relocation of learning to online platform within USIU-Africa. Based on the aforementioned factors, this study opted for online administration of the research instrument. Precisely, the administration begun by uploading the questionnaire onto the Google form thereafter a link to access the online questionnaire was generated. Through phone calls, the researcher sought permission from different course instructors within the SHSS to be allowed to share the questionnaire link to targeted students through class WhatsApp groups. Additionally, the researcher privately shared the link to the research instrument to known students and classmates via their social media handles such as Facebook, WhatsApp, Twitter, and emails. The respondents were expected to fill in the consent form after which they could access the questionnaire, fill, and submit it back to the researcher. For data analysis, both descriptive and inferential statistics were used where Pearson product moment was used to determine the correlation between the problematic smartphone use and social anxiety. Descriptive statistic was used to determine the levels of social anxiety, which were done through frequency distributions and percentages.

Results

A total of 112 questionnaires were distributed via online platform. A final tally of 110 questionnaires were successfully received back. However, 4 of the questionnaires did not meet the inclusion criteria of the study because the respondents were aged 40 years and above. The tallied questionnaires for the study were 106, which gave a response rate of 94.6%. Fincham (2008) argued that a response rate above 60% is considered excellent for the study.

Table 1: Socio-demographic Information

	Description	Frequency	Percent %
Age	Below 20	8	7.55%
	21-30	63	59.43%
	31-40	35	33.02%
Gender	Female	73	68.9%
	Male	33	31.1%
Level of education	Undergraduate	50	47.2
	Masters	56	52.8

As indicated in Table 1 above, 59.4% of the respondents were between 21-30 years old, 33% were between 31-40 years old and 7.5% were below 20 years old. The average age was 28 years old (SD = 0.587). Of the total respondents, 68.9% were female while 31.1% were male students. Regarding the level of education among the participants, 47.2 % were undergraduate students and 52.8% were undertaking their masters' studies.

The results of the level of problematic smartphone use were based on four constructs which were high, moderate, low and no presence of PSU. Table 2 shows this.

Table 2: Levels of Problematic Smartphone Use

Level of PSU	Frequency	Percent
High	10	9.4
Moderate	62	58.5
Low	32	30.2
No presence of PSU	2	1.9
Total	106	100.0

As presented in table 2, the general determination of level of problematic smartphone use among the participants revealed that 58.5% had moderate levels of PSU, 30.2% had low levels, 9.4 % showed high levels of PSU, and only 1.9% of the total respondents indicated no presence of PSU. On average, the students had a mean of 23.2 (SD = 6.08) which implied that overall, the respondents presented with moderate level of PSU. In the determination of levels of social anxiety using SIAS scoring pattern, a score less than 33 indicated low effect of social phobia or

social anxiety, 34 or more indicative of social phobia, and 43 and above implied presence of social anxiety disorder (Table 3).

Table 3: Levels of Social Anxiety

Levels of social anxiety	Frequency	Percent %
Low levels of social anxiety	81	76.4
Moderate Social anxiety	7	6.6
High Social Anxiety	18	17.0
Total	106	100.0

As seen in Table 3, the finding of current study showed that 76.4% of the respondents had low social anxiety. However, 17% of the respondents had high social anxiety, which implied that they were having generalized irrational fears across various social situations with avoidance and impairment. In addition, 6.6% indicated moderate social anxiety, which according to social interaction anxiety scale (SIAS) measurement include specific irrational social fears with avoidance and impairment. Overall, the respondents had social anxiety level mean of 23.2 (SD = 17.64) which implied low social anxiety.

Pearson correlation coefficient was used to determine the relationship between problematic smartphone and social anxiety. Table 4 shows the statistical result of the bivariate analysis carried out.

Table 4: Relationship between Problematic smartphone use and social anxiety

		PSU	Social Anxiety
Problematic smartphone use	Pearson Correlation	1	.222*
	Sig. (2-tailed)		.022
	N	106	106
Social Anxiety	Pearson Correlation	.222*	1
	Sig. (2-tailed)	.022	
	N	106	106

*. Correlation is significant at the 0.05 level (2-tailed).

Based on the bivariate analysis presented on Table 4, the result of the study showed that there was a statistically significant positive correlation ($r = 0.222$, $P < 0.05$) between problematic smartphone use and social anxiety. This result implied that when the levels of problematic

smartphone use increases, the level of social anxiety also increases. It can be argued that students with high levels of problematic smartphone use are likely to experience high social anxiety.

Discussion

In consideration of the levels of problematic smartphone use among students, this study established that 58.5% of the respondents had moderate levels of PSU, 30.2% had low levels, 9.4% showed high levels of PSU. On average, the respondents had a mean of 23 (SD = 6.08) indicating moderate level of PSU. In comparison to previous empirical studies that used a similar research instrument SAS-SV, Chen et al. (2016) found that 29.8% of undergraduate students in China had high levels of smartphone addiction. Bisen and Deshpande (2016) established 84% of the engineering student in India to have high levels of smartphone addiction. These studies results were different from the current study. Regarding the prevalence of problematic smartphone use, Lopez-Fernandez (2017) using 281 and 144 participants from Spain and Belgium, respectively, found that the prevalence of problematic smartphone use was 12.5% among Spanish and 21.5% among the Belgium participants, respectively. Among 1519 Swiss students Haug et al., (2015) established a smartphone use prevalence of 16.9% while a 36% prevalence rate of mobile phone was established among 700 students at Gonabad University Iran (Tavakolizadeh et al., 2014). Despite using a similar research tool, different results have been achieved which could be perhaps attributed to geographical and contextual differences. Cross-cultural factors perhaps could be eluded to have contributed to the differences in the results. For example, Lopez-Fernandez (2017) used the translated version of the instrument, which could be cultural appropriate with the sample size as compared to this study which used the English version which might have some contextual differences.

The present study findings on social anxiety showed that 17% of the participants had high levels of social anxiety, 6.6% showed moderate levels of social anxiety and 76.4% had low level of social anxiety. This results were closer to a previous empirical study which had a social anxiety prevalence of 25.8% conducted among 476 undergraduate students from Jaza University in Saudi Arabia (Hakami et al., 2017). Despite the Hakim et al. using social phobia inventory and Leibowitz social anxiety scale and this study adopting SIAS, slightly similar results were arrived at. Similarly, Ahmad et al., (2017) found 20.2% of students from Garmian University to have

mild levels of social anxiety, 41.9% moderate and 28.3% had severe levels of SAD, which is also about the same range to the current study result.

There were also other previous studies which established different results to this study. In a study with 503 university students from Gondar Ethiopia, Desalegn et al., (2019) established that 16.7% of the students had mild social anxiety, 9.3% had moderate level of social anxiety, 3.8%, and 1.39% had severe and very severe levels of social anxiety, respectively. On average, Desalegn et al. study indicated that students had 31.2% prevalence of social anxiety a slightly higher results compared to this current study. Likewise, Reta et al., (2020) found a 32.8% prevalence rate of social anxiety among 293 students in Hawassa University Ethiopia. Nonetheless, some of the differences in prevalence rates of social anxiety perhaps could be attributed to the use of different research tools. For example, this study used SIAS while Desalegn et al., (2019) employed social phobia inventory scale, while Hakami et al. (2017) adopted the social phobia inventory and Leibowitz social anxiety scale.

In establishing the relationship between problematic smartphone use and social anxiety, the study showed a statistically significant positive correlation ($r = 0.222$, $P < 0.05$) between the two study variables. The result was in agreement with several previous empirical studies that showed a similar result. Elhai et al., (2018) in their study with 296 college student in the United States, established a statistically significant positive correlation ($r = 0.22$, $p < 0.001$) between problematic smartphone use and social anxiety. Likewise, Hussain, et al., (2017) in their online survey targeting 640 respondents in United Kingdom, established a relationship ($r = 0.22$, $p = 0.01$) between problematic smartphone use and anxiety. Also, Demirci et al. (2015) reported a significant positive correlation ($r = 0.276$, $p < 0.001$) in study with 319 university students from Turkey. There were other previous studies that showed positive correlation between the two variables but slight differences in the correlation coefficient. Ren et al. (2017) in their study in China with 432 students found a significant positive correlation $r = 0.385$ between anxiety and internet addiction. Similarly, Sertbaş et al., (2020) in their study with 297 University students in Turkey established a positive significant correlation $r = 0.34$ between social anxiety and problematic internet use. Nonetheless, comprehensive literature research on the relationship between problematic smartphones use, mobile phone use, smartphone addiction and anxiety or

social anxiety could not locate a study that showed a negative correlation between the study variables.

Conclusion

This study focused on establishing the relationship between problematic smartphone use and social anxiety among university students. The study findings showed that university students had moderate levels of problematic smartphone use and low social anxiety. Moreover, the study revealed that there was a significant positive relationship between problematic smartphone use and social anxiety, which implied that an increase in problematic smartphone use results to an increase in social anxiety level among university students. This findings bring to the fore the discussion on students' mental wellness in relation to widespread use of smartphones and mental health disorders. This study therefore, recommends that future studies should consider looking into interventions that would support university students in order to have healthy use of smartphones.

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