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Moderating effects of gender and passive Facebook use on the relationship between social interaction anxiety and preference for online social interaction

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ABSTRACT

In recent years, internet use for online social interaction has dramatically increased among the students. Even though prior studies had confirmed that social interaction anxiety (SIA) can develop one's preference for online social interaction (POSI) over face-to-face communication, whether the association between SIA and POSI varies with one's gender and levels of passive Facebook use (PFU) are still unknown. Therefore, to address this knowledge gap, the present study examined the moderating effects of gender and PFU on the association between SIA and POSI among the university students of Bangladesh. Participants were 544 university students (55.9% male and 44.1% female). The study assessed POSI, SIA, PFU, and demographic characteristics of the participants employing cross-sectional study design. The hierarchical regression analysis suggested moderating effects of gender and PFU existed on the association between SIA and POSI. The study argued that male university students with high SIA prefer higher online social interaction than females. This research further argued that the relationship between SIA and POSI was stronger for the students with high passive Facebook use than the students with low passive Facebook use. Since POSI is one of the prime components of problematic internet use (PIU), which can adversely affect individuals' psychological and physical wellbeing; hence, these results intensify the importance of early and effective interventions for the Bangladeshi university students who are at risk of developing PIU.

KEYWORDS

Social interaction anxiety;
passive Facebook use;
preference for online social
interaction; gender;
moderating effect

Introduction

The use of the internet for web-based interaction has increased significantly over the last few years around the world (Fioravanti et al., 2020; Du Plessis, 2004). The number of internet users worldwide increased from 1,971 million (28.8% of world population) in September 2010 to 3,366 million (46.4% of world population) in December 2015, and reached 5,168 million (65.6% of world population) in March 2021 (Miniwatts Marketing Group, 2021), in order to connect with the virtual environment (De Leo & Wulfert, 2013). Moreover, computer mediated

interaction has witnessed a phenomenal leap, from around 1 billion in 2010 to 2.82 billion in 2019 (Gambo & Özad, 2020) and reached 3.6 billion users in 2021 (Statista, 2021). Therefore, these rapidly growing number of users indicate that today's interpersonal relationships among the individuals throughout the world are mostly characterized by computer mediated communication (Caplan, 2019). Scholars pointed out that such interactive computer mediated interaction can act as an expedient tool for the people with face-to-face (FtF) interaction anxiety to avoid discomfort feelings (Cheng et al., 2019; Pierce, 2009; Teppers et al., 2014; Zsido et al., 2020). The social skill model of Caplan (2005) argued that people with deficit self-presentation skills, such as loneliness, social anxiety, shyness were more likely to prefer online social interaction over FtF interaction because they discern online interaction as less intimidating and socially more effaceable. Caplan (2003) defined such preference for online social interaction (POSI) as a cognitive individual distinction characterized by the beliefs that online social interpersonal communication is more convenient, efficient, and safer than traditional FtF social interaction. The cognitive behavioral model of problematic internet use (PIU) further suggests that individuals with psychological distress, such as social interaction anxiety might develop a strong POSI over FtF communication, as a result such POSI could foster maladaptive or problematic internet use (Caplan, 2003, 2007, 2010; Caplan & High, 2011; Davis, 2001; Fioravanti et al., 2012). Moreover, Caplan (2018) pointed out that the notion problematic use of internet may no longer be restricted to habitual behavior rather it should be considered as a "pattern of inter-related cognitions and behaviours." Because with the evolution of individuals' concern with online technology and their involvement with computer-mediated communication people have experience diverse psycho-social and health-related problems in their personal and professional life. Numerous studies have found empirical evidences on individuals who experienced problems in FtF interpersonal social interaction, such as loneliness (Caplan, 2007; Leung, 2011; McKenna et al., 2002; Ye & Lin, 2015), social anxiety (Caplan, 2007; Pierce, 2009), depression (Pantic et al., 2012), shyness (Saunders & Chester, 2008), lower self-esteem (Fioravanti et al., 2012; Lee & Cheung, 2014) and low self-presentation skills (Caplan, 2005; McKenna et al., 2002) predicted higher levels of POSI.

Social interaction anxiety (SIA), commonly recognized as social anxiety (Çuhadar, 2012; Pierce, 2009) is related to one's lack of confidence in self-presentation skills (Weinstein et al., 2015), as socially anxious individuals negatively misperceived their self-presentation skills due to deficit in self-confidence (Caplan, 2005; Schlenker & Leary, 1985; Segrin & Kinney, 1995). The cognitive-behavioral models of social anxiety disorder (SAD) (Heimberg et al., 2010, 2014) posit that pessimistic self-perceptions, exaggerated self-focus and skewed views play a notable role to create and sustain heightened social anxiety. Socially anxious individual has a tendency to see themselves as uncomfortable, socially incompetent, or timid in social interaction. These detrimental self-perceptions of socially anxious individuals are thought to produce negative emotions and impede emotional control (Boden et al., 2012; Goldin et al., 2013; Spurr & Stopa, 2002), and this emotional state contributes to anticipated anxiety in social situation (Clark, 2001). Consequently, people with social anxiety usually abstain FtF social interaction (Shaw et al., 2015). Schlenker and Leary (1982) and Weinstein et al. (2015) argued that because of negative perception of self-efficiency on FtF interaction, while interpersonal communication socially anxious individuals choose to impart their self-images which carry low risk. Accordingly, Caplan (2007) and Pierce (2009) reported that socially anxious individuals prefer online communication over FtF interaction. In line with the prior arguments and evidences Weidman et al. (2012) also noted that when interacting offline compared to online, people

with higher social anxiety expressed strong feelings of distress and put higher importance on the lower social pressure of online interaction in enhancing their social experience than people with lower social anxiety.

However, an increasing number of research reported that both female and male experience social interaction anxiety and prefer online social interaction (Pierce, 2009; Valkenburg & Peter, 2007). Many of the studies found significant differences in social interaction anxiety by gender, with females experiencing higher social anxiety compared to males (Pierce, 2009; Valkenburg & Peter, 2007). Whereas, few studies didn't find any significant differences in social interaction anxiety score between male and female (Baloğlu et al., 2018; Barnett et al., 2021; Osman et al., 1998). Furthermore, Greenfeld and Sutker (1999) reported that female participants were more open in net than offline social situation. Likewise, Pierce (2009) and Kimbrough et al. (2013) found that females, compared to males, were more comfortable using social networking sites and online text massaging than FtF talking with others. On the contrary, studies also reported that males spent significantly higher time online (Dufour et al., 2016) and having higher tendency toward PIU (Çuhadar, 2012; Odacı & Çıkırıkcı, 2014; Su et al., 2019) compare to the female participants. However, Fioravanti et al. (2012) found no differences for the POSI scores in terms of gender. Since social anxiety affects individuals' preference for types of social interaction, it is very imperative to examine the association between SIA and POSI by gender. Moreover, numerous studies have highlighted the influential role of gender as a third variable (moderator) while explaining relationships between two variables. Therefore, the first question rises about the relationship between SIA and POSI is that whether they differ according to gender. Thus, it is warrant to understand the moderating effect of gender on this relationship because it is closely associated with individuals' PIU and their physical, social, and psychological wellbeing (Best et al., 2014; Weidman et al., 2012).

Nowadays, Facebook (FB) has turn out as a top-rated social networking site for modern online social behavior, particularly amongst the students (Fioravanti et al., 2020; Pierce, 2009; Rauch et al., 2014; Sayeed et al., 2020; Shaw et al., 2015; Tandoc et al., 2015), which intensely affecting their mode of interaction (Rauch et al., 2014; Ryan et al., 2014). Prior research indicates that Facebook is not about just singing in, however, Facebook allows its users to perform variety of functions (Frison & Eggermont, 2020; Gerson et al., 2017; Smock et al., 2011) from passively viewing other's content, such as consuming other's photos, videos, posts or status to creating own content and directly interacting with others, such as posting photos, videos, opinion, sending massages, chatting, and commenting on the posts of others (Shaw et al., 2015; Tandoc et al., 2015; Verduyn et al., 2015). In line with this agreement, scholars classified Facebook usages into major two categories, such as active and passive use of Facebook (Burke et al., 2010; Fioravanti & Casale, 2020; Verduyn et al., 2015). Active Facebook use (AFU) is conceptualized by actively engaged with Facebook through posting text, opinion, photos, and videos. In contrast, passive Facebook use (PFU) involves consuming information without creating any content, such as simply viewing other's posts, status updates, public conversations, photos or videos, profiles etc. (Burke et al., 2010; Fioravanti & Casale, 2020; Gerson et al., 2017). Passive Facebook use was also identified as surveillance (Tandoc et al., 2015) or lurking (Brandtzæg, 2012). This distinction of Facebook use is very important because scholars identified different types of Facebook usages lead to varied outcomes (Tandoc et al., 2015). Prior studies indicated that AFU was strongly related with decreased loneliness (Burke et al., 2010), better mood (Macrynika &

Miranda, 2019) and increased affective well-being (Frison & Eggermont, 2020). Whereas PFU was related with increased loneliness (Burke et al., 2010), higher social anxiety (Shaw et al., 2015), increased depression (Tosun & Kaşdarma, 2020), increased nature of envy incidents (Krasnova et al., 2013; Tandoc et al., 2015), lower life satisfaction (Krasnova et al., 2013; Verduyn et al., 2015) and declined well-being (Verduyn et al., 2015). In particular, passive use of Facebook by socially anxious people, according to Erwin et al. (2004), can weaken the motivation to engage in FtF social interaction and sustain social anxiety symptoms. These findings assist to explain the discrepancies found in studies, implying that particular types of Facebook use are beneficial to one's wellbeing, while others have a detrimental impact (Young et al., 2017). Besides, several studies reported that individuals, particularly students spent more time on Facebook passively observing the contents of others than active Facebook usages (Pierce, 2009; Verduyn et al., 2015). Thus, the ongoing tendency of passively using Facebook or to "lurk" on other people's profiles raises the question that how such activities affect one's POSI, especially among the socially anxious (Rauch et al., 2014). Consequently, the second question emerges that what is the role of PFU on the relationship between SIA and POSI.

Moreover, Shaw et al. (2015) noted that passively using Facebook seems to be a sort of maladaptive internet use that people with social anxiety disorder may engage in on a regular basis. Likewise, O'Day and Heimberg (2021) pointed out that individuals with social anxiety are at a higher risk of using social media constantly and passively. Because individuals with social anxiety are fearful and anxious in social circumstances where they believe to be harshly appraised or criticized by others, which can impede their ability to form meaningful social relationships (Hofmann, 2007; Rapee & Heimberg, 1997). Furthermore, socially anxious people may prefer online interaction over FtF interaction as a result of their maladaptive social beliefs, thus, increase the likelihood of their online engagement more frequently (Caplan, 2005; O'Day & Heimberg, 2021; Weidman et al., 2012). Additionally, they might usually be occupied with the thought of negative upward social comparisons, in which they perceive themselves as being less positive than others (Antony et al., 2005). As a consequence, socially anxious individuals are more prone to engage passively online and feel socially isolated because of their increased tendency of negatively comparing themselves to others (O'Day & Heimberg, 2021). Altogether, it is evident from the literature that socially anxious people prefer and search for online relationships over FtF interactions, and they tend to use social networking sites more problematically, as it is explicit from the literature in terms of higher frequency, maladaptive, and passive use (O'Day & Heimberg, 2021). Therefore, up to present, there have been a significant number of scholarly investigations explored the association between social anxiety and preference for online social interaction with cross-sectional data, however, no studies had investigated the effects of gender and passive Facebook use on the relationship between SIA and POSI. Thus, it is evident from the literature on social anxiety and POSI that there is a deficiency of studies on the potential moderators for the relationship between SIA and POSI.

However, in consonance with global trend, internet use for online communication among the adolescent and young adult, in particular among the students have also been intensely increased in Bangladesh over the last decade (Akhter & Khalek, 2020; Hassan et al., 2020). The numbers of internet subscribers in Bangladesh was 0.1 million in 2000, 0.6 million in 2010 and reached 116.14 million at the end of May, 2021 (BTRC, 2021; Karim & Nigar, 2014), which was faster than the growth and socio-economic development of the

country itself (Islam & Hossin, 2016). Moreover, in recent years, the increasing rate of Facebook users in Bangladesh has also received a significant attention to the scholars. According to data from NapoleonCat (2021), there were 48.2 million Facebook users in Bangladesh in May 2021 (about 28% of the total population), where men made up the majority (69.1%), and most of the Facebook users were 18 to 24 years old (21.2 million). 84% of the internet subscribers of Bangladesh use social networking sites, mainly Facebook (Sayeed et al., 2020) and approximately 40% students are at the risk of developing Facebook addiction (Al Mamun & Griffiths, 2019). Despite the positive effects of internet and Facebook for online social interaction, these are not without disputes. Several studies in Bangladesh had also showed that excessive internet use or PIU can adversely affect physical and psychological health of the adolescents and young adults, more precisely the university students (Akhter & Khalek, 2020; Islam & Hossin, 2016; Al Mamun & Griffiths, 2019). Islam and Hossin (2016) found PIU was significantly related with the emotional distress amongst the undergraduate and graduate students of Bangladesh. Similarly, Akhter and Khalek (2020) argued that loneliness and SIA as the components of psychological wellbeing were significant predictors of PIU. Moreover, Jahan et al. (2019) reported that the degree of poor sleep quality was increased by internet addiction among the students. Al Mamun and Griffiths (2019) found that the problematic use of FB among the university students of Bangladesh adversely affect their psychological health. Hassan et al. (2020) and Islam et al. (2020) reported that spending time on social networking sites was the utmost important online activity of the students and which was significantly associated with PUI. Additionally, Sayeed et al. (2020) found having stressful life event, depression, higher time spent on Facebook, sleep disturbance as the potential risk factors of developing Facebook addiction among the university students of Bangladesh. Despite the prior discussed scholarly investigations on social anxiety, Facebook use and preference for online social interaction among the students, there are numbers of significant knowledge gaps in this regard. First, there is a paucity of study on the potential moderating effect on SIA and POSI relationship. Second, previous studies in Bangladesh on Facebook use mostly measured through time spent and frequency of Facebook, and unidimensional instrument on Facebook addiction. No studies measured the passive form of Facebook use, which showed detrimental effects on individuals psychological and physical wellbeing compared to other forms of Facebook usages. Third, no studies in Bangladesh had directly examined the association between social anxiety and online social interaction preference. Since a growing number of scholars suggested that POSI among socially anxious individuals was associated with PIU (Caplan, 2007) and passively using Facebook enhanced one's social anxiety symptoms by comparing themselves with others or inducing Facebook envy (Shaw et al., 2015) which affect their physical and psychological wellbeing (Tandoc et al., 2015). Hence, the rapidly evolving nature of internet mediated interactions, increased time spending on social networking sites and maladaptive internet use among the university students of Bangladesh necessitates the investigation on the association between SIA and POSI with potential moderators (see Figure 1).

However, based on the literature to our knowledge, no studies had examined the moderating role of gender and PFU on the association between SIA and POSI in Bangladesh. Since, PIU largely depend on one's POSI, it is warrant to gain a better understanding on the association between SIA and POSI among the female and male university students, and does this association varies depending on the levels of PFU of the university

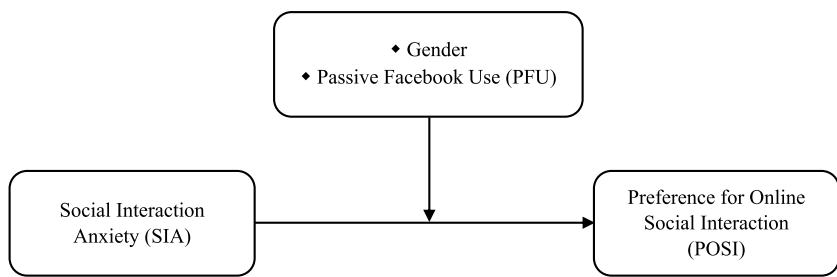


Figure 1. Conceptual diagram.

students, because it will assist the planners and policy makers to develop an effective intervention strategy for the target population. Thus, our study aimed to contribute to the knowledge gap by investigating the moderating role of respondents’ gender and PFU on the association between SIA and POSI.

Methods

Participants

A total of 544 undergraduate and graduate level students of Rajshahi University and Rajshahi Collage under National University (two largest educational institutions of north-ern region in Bangladesh) were participated in the study. Both residential and nonresiden-tial students were recruited for the present research. Residential students were recruited randomly and nonresidential participants were conveniently selected from 20 randomly selected departments of the two educational institutions. Among the participants 304 (55.9%) were males and 240 (44.1%) were females. The mean age of the female students was 22.38 years (SD = 1.30) and male students was 22.71 years (SD = 1.50).

Measures

Preference for online social interaction (POSI)

POSI was measured through the subscale of Generalized Problematic Internet Use 2 (GPIU2) developed by Caplan (2010). The subscale consisted three items (e.g., “online social interaction is more comfortable to me than face-to-face interaction”). The partici-pants rated their responses on 6-point Likert type scale ranging from 0 (strongly disagree) to 5 (strongly agree). To yield the total score the subscale items’ scores were summed up. Higher score indicated higher POSI. Cronbach’s alpha coefficient for POSI was 0.84 in the present study.

Social interaction anxiety (SIA)

Social Interaction Anxiety (SIA) was assessed through 20 items self-reported Social Interaction Anxiety Scale (Mattick & Clarke, 1998). The items (e.g., “When mixing socially, I am uncomfortable”) were rated on 5-point Likert type scale ranging from 0 (not at all true for me) to 4 (extremely true for me). The sum scores of SIAS were ranged from 0 to 80,

where higher sum scores indicated higher levels of SIA among the participants. In the present study, the SIAS was reliable ($\alpha = 0.86$).

Passive Facebook use (PFU)

Passive Facebook use (PFU) was measured through the subscale of Passive and Active Facebook Use Measure (PAUM) developed by Gerson et al. (2017). The subscale consisted of four items, such as how frequently do you perform the following activities when you are on Facebook [e.g., “checking to see what someone is up to,” “browsing the newsfeed passively (without liking or commenting on anything)”. The items were rated using a 5-point Likert scale (0 = never to 4 = several times per day). This subscale yielded a total scale, ranging from 0 to 16 with a mean value of 11.44 ($SD = 3.16$). Higher scores of PFU indicated higher levels of PFU of the participants. In the present study, the Cronbach’s alpha coefficient was excellent ($\alpha = 0.90$).

Demographic variables

Participants’ demographic information, such as age, gender, device used for internet and time spent on online activities etc. were collected. Gender was coded as 0 = female and 1 = male.

Procedure

The present research employed cross-sectional study protocol. Data were collected from the students through FtF interviews using structured questionnaires. To recruit the residential students, first, the room numbers of all residential halls were selected randomly. Then, one student from each room was approached for the interview. To recruit the nonresidential students, first 20 departments from nine faculties were randomly selected. Then nonresidential students were conveniently approached for the interviews at the end of their classes. Five trained graduate students, two females, and three males conducted the interviews.

The purpose of the research was elucidated to the participants by the interviewers prior to the interviews. Their participations were completely voluntary and responses were recognized by a numerical code. The respondents were further reminded that they had no obligation to complete the interviews; they could refuse to participate at any time. All respondents provided written consent before the interviews. The procedure carried out for this research was in accordance with the ethical principles set by the Helsinki declaration of 1964 and its later amendments.

Statistical analysis

The software SPSS version 24 and MS-excel were used in the present research to conduct all analyses. First, descriptive statistics of sample characteristics, such as frequency, mean, standard deviation were conducted for descriptive purpose. Second, bivariate correlation analysis between independent and dependent variables was conducted to present the relationships among the study variables and t-test was employed to estimate the differences of SIA, POSI and PFU scores by gender. Finally, to examine the moderating effect of gender and PFU on the association between SIA and POSI three steps moderated hierarchical

regression analysis was performed as recommended by (Cohen et al., 2013). Assumptions were tested to run the analyses.

Results

Descriptive and bivariate statistics

Descriptive statistics of POSI, SIA, and PFU by gender were presented in Table 1. Findings showed that 55.9% participants were male and 44.1% participants were female. Mean score of POSI for the female participants was 4.41 (SD = 2.79) and male was 4.71 (SD = 2.89), the average score of SIA for the female participants was 25.84 (SD = 10.00) and male participants was 25.00 (SD = 11.30), and the average score of PFU for the female participants was 11.28 (SD = 2.89) and male participants was 11.57 (SD = 3.29) respectively. Independent sample t-test exhibited that the average scores of POSI, SIA, and PFU didn't vary with the female and male university students (see Table 1). However, the study identified a significant positive association between SIA and POSI ($r = 0.37, p < .01$). Furthermore, our study also found moderate relationships between POSI and PFU ($r = 0.49, p < .01$), and between SIA and PFU ($r = 0.44, p < .01$) respectively (see Table 2). Therefore, respondent's passive Facebook use was moderately associated with their POSI and SIA.

Test of moderation effect of gender on the association between SIA and POSI

Findings of the study showed that POSI and SIA had mean scores of 4.58 (SD = 2.85) and 25.37 (SD = 10.74) respectively (see Table 2). Hierarchical regression analysis was used to examine the moderating effect of gender on the association between SIA and POSI (see Table 3). At the first step, SIA was added into the model. SIA explained 13.7% variance for POSI [$F(1, 543) = 86.17, p < .001$]. SIA ($\beta = 0.37, t = 9.28, p < .001$) and significantly contributed to the model. At the second step, the moderator variable gender was added into the model. Gender ($\beta = 0.07, t = 1.70, p > .05$) did not predict POSI significantly. At

Table 1. Participant's POSI, SIA, and PFU by gender.

Variables		Mean	SD	Min	Max	t
POSI	Female	4.41	2.79	0	11	1.24
	Male	4.71	2.89	0	12	
SIA	Female	25.84	10.00	3	55	0.92
	Male	25.00	11.30	2	56	
PFU	Female	11.28	2.98	4	16	1.04
	Male	11.57	3.29	4	16	

POSI, Preference for Online Social Interaction; SIA, Social Interaction Anxiety; PFU, Passive Facebook Use

Table 2. Correlations among POSI, SIA, PFU and Gender.

Variables	Mean	SD	1	2	3	4
1. POSI	4.58	2.85	1			
2. SIA	25.37	10.74	0.37**	1		
3. PFU	11.44	3.16	0.49**	0.44**	1	
4. Gender	0.56	0.50	0.05	-0.04	0.04	1

** $p < .01$

Table 3. Moderating effect of gender on the association between SIA and POSI.

		B	SE	Std. β	t	R^2	ΔR^2	F	ΔF
Step 1	Constant	2.09	0.29		7.16***	0.137		86.17***	86.17***
	SIA	0.10	0.01	0.37	9.28***				
Step 2	Constant	1.85	0.32		5.75***	0.142	0.005	44.78***	2.89
	SIA	0.10	0.01	0.37	9.36***				
	Gender	0.39	0.23	0.07	1.70				
Step 3	Constant	3.07	0.47		6.54***	0.161	0.019	34.57***	12.45***
	SIA	0.05	0.02	0.20	3.07**				
	Gender	-1.55	0.59	-0.27	-2.61**				
	SIA $\times$ Gender	0.08	0.02	0.40	3.53***				

*** $p < .001$, ** $p < .01$

the third step, the interaction of gender $\times$ SIA was added into the model. The significant changes in R^2 for the interaction term gender $\times$ SIA indicated a significant moderating effect, $\Delta R^2 = 0.019$, $\Delta F(3, 543) = 12.45$, $p < .001$. The interaction between gender and SIA ($\beta = 0.40$, $t = 3.53$, $p < .001$) significantly predicted POSI. Therefore, our study findings suggested that gender moderated the relationship between SIA and POSI.

To illustrate the gender $\times$ SIA interaction for POSI, we plotted separate regression lines for the male and female groups (see Figure 2). In consistence with the procedure suggested by Aiken et al. (1991), we used simple slope analysis to further examine the effect of SIA on POSI in male and female groups separately. Figure 2 showed that SIA significantly predict POSI in the male ($\beta = 0.13$, $t = 9.61$, $p < .001$) and female ($\beta = 0.05$, $t = 3.27$, $p > .01$) group. However, the findings suggested that SIA tend to be a higher significant positive predictor of POSI among the male university students than the females, indicating that gender functioned as a moderator for the association between SIA and POSI.

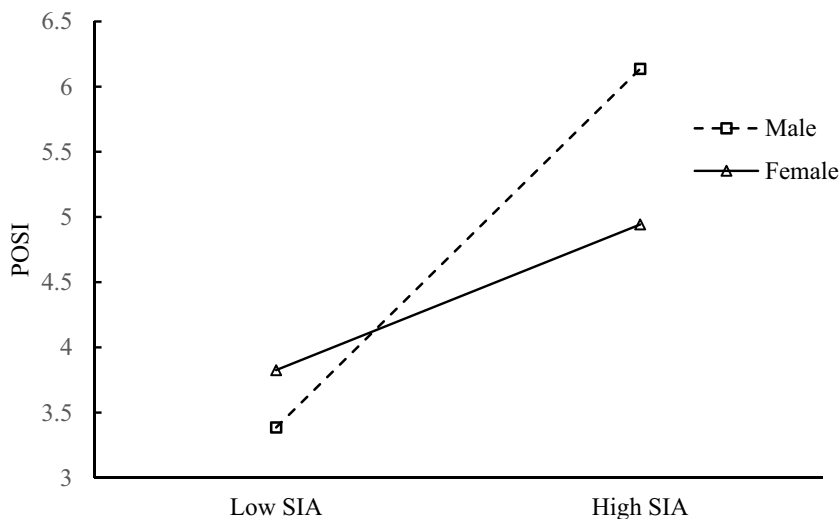
**Figure 2.** Moderating role of gender and SIA on POSI.

Table 4. Moderating effect of PFU on the relationship between SIA and POSI.

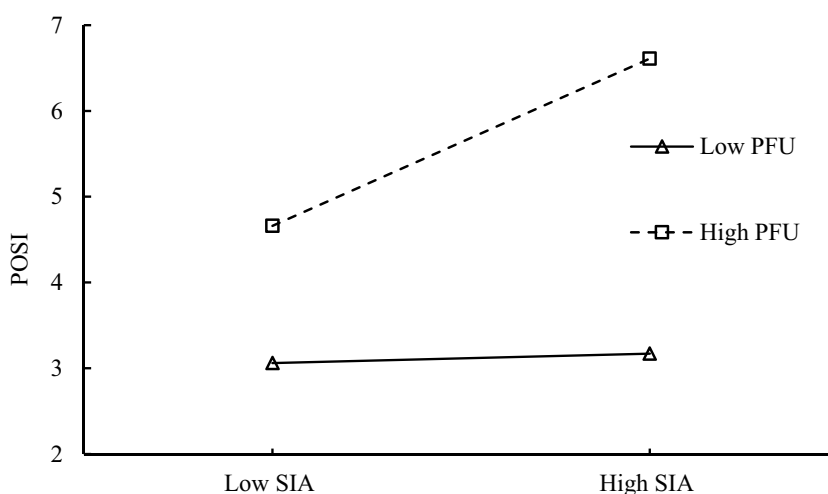
		B	SE	Std. β	t	R ²	ΔR^2	F	ΔF
Step 1	Constant	2.09	0.29		7.16***	0.137		86.17***	
	SIA	0.10	0.01	0.37	9.28***				
Step 2	Constant	-0.85	0.40		-2.12*	0.266	0.129	98.20***	95.25***
	SIA	0.05	0.01	0.19	4.74***				
	PFU	0.36	0.04	0.40	9.76***				
Step 3	Constant	2.55	0.77		3.32***	0.301	0.035	77.48***	26.69**
	SIA	-0.11	0.03	-0.40	-3.30***				
	PFU	0.05	0.07	0.06	0.78				
	SIA $\times$ PFU	0.01	0.003	0.83	5.17***				

*** $p < .001$, ** $p < .01$, * $p < .05$

Test of moderation effect of PFU on the relationship between SIA and POSI

So as to investigate the moderating role of university students' levels of passive Facebook use on the association between SIA and POSI similar process was employed (see Table 4). The order of the variables entered in the hierarchical model was as follows. At the first step, SIA was added into the model. At the second step, the moderating variable PFU was added into the model. PFU accounted for 12.9% significant variation in the score of POSI, $\Delta R^2 = 0.129$, $\Delta F(2, 543) = 95.25$, $p < .001$. Passive Facebook use ($\beta = 0.40$, $t = 9.76$, $p > .001$) significantly predicted POSI. At step 3, the interaction term of PFU and SIA was entered into the model. The significant changes in R^2 for the interaction term PFU $\times$ SIA indicated a significant moderating effect, $\Delta R^2 = 0.035$, $\Delta F(3, 543) = 77.48$, $p < .001$. The interaction between passive Facebook use and SIA ($\beta = 0.83$, $t = 5.17$, $p < .001$) significantly predicted POSI. Therefore, our study findings indicated that the levels of passive Facebook use of the university students significantly moderates the relationship between SIA and POSI.

To interpret the PFU $\times$ SIA interaction effect for POSI, we plotted separate regression lines of social interaction anxiety on preference for online social interaction at high and low levels of passive Facebook use (see Figure 3). In line with the process outlined by Aiken et al.

**Figure 3.** Moderating role of PFU and SIA on POSI.

(1991), we used simple slope for the regression of passive Facebook use on the relationship between SIA and POSI by using high (+1SD) and low (−1SD) values of PFU. Findings revealed that the relationship between SIA and POSI was significant for the high levels of PFU ($\beta = 0.09$, $t = 6.95$, $p < .001$). In contrast, at low levels of PFU the relationship between SIA and POSI was not significant ($\beta = 0.005$, $t = 0.35$, $p = .72$). Therefore, the findings suggested that the university students with higher levels of passive Facebook use, SIA was a significant determinant of POSI. On the contrary, at the low levels of passive Facebook use, SIA did not influence POSI.

Discussion

Drawing on Caplan's social skill model of PUI, the present study aimed to advance the knowledge by investigating the association between SIA and POSI, and contribute to the knowledge gap by investigating the moderating effects of gender and passive Facebook use on the relationship between SIA and POSI among the Bangladeshi university students. The present research found that SIA significantly predicted POSI, which was aligned with Caplan (2005) argument on people having deficient self-presentation capacity would consider online social interaction more convenient than FtF communication. Similar to our findings, Casale et al. (2016) also found that one's lack of ability to regulate emotional activities may drive symptoms of PIU to a higher extent than the arousal of negative emotions. Likewise, Chen (2019) reported that communication anxiety increased students' POSI and reduced their well-being. In addition, findings from bivariate correlations also identified significant positive associations between SIA, POSI, and PFU. The result was consistent with the previous research indicated that increased passive Facebook use was linked to one's increased social anxiety (Erwin et al., 2004; Shaw et al., 2015) and individuals who were socially anxious feel comfortable with online social interaction over FtF settings (Bonetti et al., 2010; Caplan, 2007; Markovitzky et al., 2012; McKenna et al., 2002; Peter et al., 2005).

The study found no significant differences for the POSI, SIA, and PFU scores among the male and female university students in Bangladesh. Furthermore, gender did not predict POSI significantly. Our findings continue to support the previous as well as more recent studies that didn't find significant gender differences in mean scores of social anxiety (Baloğlu et al., 2018; Osman et al., 1998) and in mean scores of POSI (Fioravanti et al., 2012). Therefore, our argument is that such gender disparities have diminished to the point that they are no longer important, given the educational attainment of girls, modern age, community, society, and characteristics of the current population in Bangladesh.

However, our study found that gender moderate the association between SIA and POSI, suggesting that the male university students with high social interaction anxiety prefer higher online social interaction than female university students. Even though few studies had found the contrary that females more than males feel more comfortable to interact online compared to FtF social interaction (Pierce, 2009). Baloğlu et al. (2018) argued that individual with higher social interaction anxiety may accomplish their needs on the internet and prefer online social interaction; however, the patterns of such accomplishment vary between male and female. There was strong evidence that male students inclined to use higher maladaptive or problematic internet compared to the females in Bangladesh (Akhter et al., 2020; Islam & Hossin, 2016). The use of internet is usually elucidated by the distinct

personality patterns and purpose of internet use by male and female students. Male students, for example, are typically more enthusiastic (Ball et al., 1984; Islam & Hossin, 2016), experience less parental control (Tsai et al., 2009); therefore, when they experience deficit self-presentation skills, such as social interaction anxiety were found to engaged extensively with online social interaction, online gaming, and watching porn online than their female counterparts (Chowdhury et al., 2018; Doornwaard et al., 2016). Likewise, several researchers further reported that the association between POSI and internet addiction was higher among the boys than the girls (Lee et al., 2015). Therefore, we conclude that male university students with higher SIA are under greater risk of developing higher POSI, which, in turn, might lead them to internet addiction or PIU.

The present research also found that PFU moderated the relationship between SIA and POSI. This moderating effect was significant among the university students with high passive Facebook use, whereas, at the low level of PFU, SIA did not influence POSI. Therefore, the results of the study disclosed that when the Bangladeshi university students reported a high level of passive Facebook use, those with the high level of social interaction anxiety showed higher scores in preference for online social interaction, than those with low social interaction anxiety. Moreover, at the high and low levels of social interaction anxiety group had lower preference for online social interaction when the students stated a low level of passive Facebook use, suggesting that increased passive Facebook use with high social anxiety is crucial for developing high preference for online interaction, which might adversely affect one's real life. This result was consistent with earlier research which reported that because of negative perception of self-efficiency individuals with social anxiety symptoms find online interactions particularly appealing as it allows greater control over self-presentation and impart their self-images in a low-pressure environment with relative anonymity (Schlenker & Leary, 1982; Shaw et al., 2015; Weinstein et al., 2015). The most common motives for using Facebook in a passive manner are to minimize uncertainty and equate oneself to others (McEwan, 2013). Passive use of Facebook by socially anxious individuals weakens the motivation to engage in FtF social interaction (Erwin et al., 2004), thereby, prefer online social interaction as an attempt to compensate for deficit interactions experienced in FtF settings (McCord et al., 2014; Shaw et al., 2015). Similarly, several studies suggested that individuals with higher social anxiety (Pierce, 2009), shyness (Saunders & Chester, 2008), loneliness (Iranmanesh et al., 2019) and with psychological distress (Pontes et al., 2018) were more likely to engaged in extensive use of social networking sites and prefer online social interaction than FtF communication (Indian & Grieve, 2014; McCord et al., 2014; Pontes et al., 2018).

Strengths and limitations

Few limitations of the present investigation should be noted. First, the study only focused on passive Facebook use to explain how social interaction anxiety influence preference for online social interaction, while active Facebook use was not included in the study. Further study should consider both active and passive Facebook use of the respondents. Second, the study used cross-sectional structure to investigate the moderating effect of gender and passive Facebook use on the association between SIA and POSI; hence, we can't claim about the causality, which was a one of the most important limitations of the study. Therefore, further research may employ experimental or longitudinal study design. Third, data were collected from only two universities of northern part in Bangladesh. Therefore, generalizability of the study results was confined. Further study should consider more representative sample throughout the country.

However, with some notable intensity, this research contributes to the related literature. To our knowledge, as previously reviewed, the moderating effect of gender and passive Facebook use on the association between SIA and POSI has not been investigated amongst the Bangladeshi university students. Therefore, our research is an initial attempt to contribute scientific knowledge by providing insights to support the Caplan's social skill model of PIU and new evidences by shading lights on the roles which gender and passive Facebook use play in the relationship between SIA and POSI.

Conclusion

The social skills model of PIU argued that people who consider them to have poor social self-presentation skills are at risk of developing a propensity for social interaction online, which, in turn, could lead to PIU. Several studies have also reported that PIU can have adverse effects on numbers of psychological and physical aspects affecting psychological and physical well-being of the adolescents and young adults. It was evident from the literature that the association between SIA and POSI had not been investigated in Bangladesh. Thus, the present study investigated the moderating effect of the gender and passive Facebook use on the relationship between SIA and POSI. This investigation took the first attempt to look at this relationship with a sample of university students in Bangladesh and to extend the research by examining gender and passive Facebook use as the moderators for this relationship. The study discovered SIA significantly predicted POSI, supporting Caplan's social skills model of PIU, arguing that people with low self-presentation ability will find online social interaction more convenient than face-to-face contact.

The study findings indicated that social interaction anxiety had a strong predictive power on preference for online social interaction for male university students than the females. That is, male university students with higher social interaction anxiety tend to prefer higher online social interaction than the females with higher social interaction anxiety. The study also found passive Facebook use moderate the relationship between SIA and POSI. Further simple slope analysis identified that the relationship between SIA and POSI was stronger for the Bangladeshi university students with high passive Facebook use than the low passive Facebook use. Therefore, the study findings argued that gender difference and levels of passive Facebook use should be taken into consideration while addressing the issue of social anxiety and preference for online social interaction among the Bangladeshi university students.

Notwithstanding the limitations, the current research extends prior investigations by highlighting the moderating effect of gender and passive Facebook use on the relationship between SIA and POSI among the university students of Bangladesh. Since POSI is a key component of PIU and it can adversely affect individuals' psychological and physical wellbeing, thus, the findings of the current investigation have significant implications of early interventions for the university students of Bangladesh.

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References

- Aiken, L. S., West, S. G., & Reno, R. R. (1991). *Multiple regression: Testing and interpreting interactions*. sage.
- Akhter, M. S., Islam, M. H., & Momen, M. N. (2020). Problematic internet use among university students of Bangladesh: The predictive role of age, gender, and loneliness. *Journal of Human Behavior in the Social Environment*, 30(8), 1082–1093. <https://doi.org/10.1080/10911359.2020.1784346>
- Akhter, M. S., & Khalek, M. A. (2020). Association between psychological well-being and problematic internet use among University Students of Bangladesh. *Journal of Technology in Behavioral Science*, 5(4), 357–366. <https://doi.org/10.1007/s41347-020-00142-x>
- Al Mamun, M., & Griffiths, M. D. (2019). The association between Facebook addiction and depression: A pilot survey study among Bangladeshi students. *Psychiatry Research*, 271, 628–633. <https://doi.org/10.1016/j.psychres.2018.12.039>
- Antony, M. M., Rowa, K., Liss, A., Swallow, S. R., & Swinson, R. P. (2005). Social comparison processes in social phobia. *Behavior Therapy*, 36(1), 65–75. [https://doi.org/10.1016/S0005-7894\(05\)80055-3](https://doi.org/10.1016/S0005-7894(05)80055-3)
- Ball, I. L., Farnill, D., & Wangeman, J. F. (1984). Sex and age differences in sensation seeking: Some national comparisons. *British Journal of Psychology*, 75(2), 257–265. <https://doi.org/10.1111/j.2044-8295.1984.tb01897.x>
- Baloğlu, M., Kozan, H. İ. Ö., & Kesici, Ş. (2018). Gender differences in and the relationships between social anxiety and problematic internet use: Canonical analysis. *Journal of Medical Internet Research*, 20(1), e33. <https://doi.org/10.2196/jmir.8947>
- Barnett, M. D., Maciel, I. V., Johnson, D. M., & Ciepluch, I. (2021). Social anxiety and perceived social support: Gender differences and the mediating role of communication styles. *Psychological Reports*, 124(1), 70–87. <https://doi.org/10.1177/0033294119900975>
- Best, P., Manktelow, R., & Taylor, B. (2014). Online communication, social media and adolescent wellbeing: A systematic narrative review. *Children and Youth Services Review*, 41, 27–36. <https://doi.org/10.1016/j.childyouth.2014.03.001>
- Boden, M. T., John, O. P., Goldin, P. R., Werner, K., Heimberg, R. G., & Gross, J. J. (2012). The role of maladaptive beliefs in cognitive-behavioral therapy: Evidence from social anxiety disorder. *Behaviour Research and Therapy*, 50(5), 287–291. <https://doi.org/10.1016/j.brat.2012.02.007>
- Bonetti, L., Campbell, M. A., & Gilmore, L. (2010). The relationship of loneliness and social anxiety with children's and adolescents' online communication. *Cyberpsychology, Behavior and Social Networking*, 13(3), 279–285. <https://doi.org/10.1089/cyber.2009.0215>
- Brandtzæg, P. B. (2012). Social networking sites: Their users and social implications—A longitudinal study. *Journal of Computer-mediated Communication*, 17(4), 467–488. <https://doi.org/10.1111/j.1083-6101.2012.01580.x>
- BTRC. (2021). *Internet Subscribers in Bangladesh March, 2021*. Bangladesh Telecommunication Regulatory Commission Retrieved May, 17 from <http://www.btrc.gov.bd/content/internet-subscribers-bangladesh-march-2021>
- Burke, M., Marlow, C., & Lento, T. (2010). Social network activity and social well-being. In *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 1909–1912). Atlanta, GA: ACM. <https://doi.org/10.1145/1753326.1753613>
- Caplan, S. E. (2003). Preference for online social interaction: A theory of problematic Internet use and psychosocial well-being. *Communication Research*, 30(6), 625–648. <https://doi.org/10.1177/0093650203257842>
- Caplan, S. E. (2005). A social skill account of problematic Internet use. *Journal of Communication*, 55(4), 721–736. <https://doi.org/10.1111/j.1460-2466.2005.tb03019.x>
- Caplan, S. E. (2007). Relations among loneliness, social anxiety, and problematic Internet use. *CyberPsychology & Behavior*, 10(2), 234–242. <https://doi.org/10.1089/cpb.2006.9963>
- Caplan, S. E. (2010). Theory and measurement of generalized problematic Internet use: A two-step approach. *Computers in Human Behavior*, 26(5), 1089–1097. <https://doi.org/10.1016/j.chb.2010.03.012>

- Caplan, S. E. (2018). *The changing face of problematic internet use: An interpersonal approach*. Peter Lang Incorporated, International Academic Publishers.
- Caplan, S. E. (2019). Putting Communication First: Recommendations for Studying Human Communication and Technology. *Human Communication & Technology*, 1(1), 27–33. <https://doi.org/10.17161/hct.v1i1.13274>
- Caplan, S. E., & High, A. C. (2011). Online social interaction, psychosocial well-being, and problematic Internet use. In K. S. Young & C. N. de Abreu (Eds.), *Internet addiction: A handbook and guide to evaluation and treatment* (pp. 35–53). John Wiley & Sons, Inc.
- Casale, S., Caplan, S. E., & Fioravanti, G. (2016). Positive metacognitions about Internet use: The mediating role in the relationship between emotional dysregulation and problematic use. *Addictive Behaviors*, 59, 84–88. <https://doi.org/10.1016/j.addbeh.2016.03.014>
- Chen, Y. (2019). How Does Communication Anxiety Influence Well-Being? Examining the Mediating Roles of Preference for Online Social Interaction (POSI) and Loneliness. *International Journal of Communication*, 13, 19. <https://ijoc.org/index.php/ijoc/article/view/9926>
- Cheng, C., Wang, H.-Y., Sigerson, L., & Chau, C.-L. (2019). Do the socially rich get richer? A nuanced perspective on social network site use and online social capital accrual. *Psychological Bulletin*, 145(7), 734. <https://doi.org/10.1037/bul0000198>
- Chowdhury, M. R. H. K., Chowdhury, M. R. K., Kabir, R., Perera, N. K., & Kader, M. (2018). Does the addiction in online pornography affect the behavioral pattern of undergrad private university students in Bangladesh? *International Journal of Health Sciences*, 12(3), 67. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5969781/>
- Clark, D. M. (2001). A cognitive perspective on social phobia. In W. Crozier & L. Alden (Eds.), *International handbook of social phobia: Concepts, research, and interventions relating to self and shyness* (pp. 405–430). John Wiley & Sons.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2013). *Applied multiple regression/correlation analysis for the behavioral sciences*. Routledge.
- Çuhadar, C. (2012). Exploration of problematic Internet use and social interaction anxiety among Turkish pre-service teachers. *Computers & Education*, 59(2), 173–181. <https://doi.org/10.1016/j.compedu.2011.12.029>
- Davis, R. A. (2001). A cognitive-behavioral model of pathological Internet use. *Computers in Human Behavior*, 17(2), 187–195. [https://doi.org/10.1016/S0747-5632\(00\)00041-8](https://doi.org/10.1016/S0747-5632(00)00041-8)
- De Leo, J. A., & Wulfert, E. (2013). Problematic Internet use and other risky behaviors in college students: An application of problem-behavior theory. *Psychology of Addictive Behaviors*, 27(1), 133. <https://doi.org/10.1037/a0030823>
- Doornwaard, S. M., van Den Eijnden, R. J., Baams, L., Vanwesenbeeck, I., & Ter Bogt, T. F. (2016). Lower psychological well-being and excessive sexual interest predict symptoms of compulsive use of sexually explicit Internet material among adolescent boys. *Journal of Youth and Adolescence*, 45(1), 73–84. <https://doi.org/10.1007/s10964-015-0326-9>
- Du Plessis, C. (2004). Web-based communication: The need for more valuable on-line information. *Communication*, 30(1), 111–130. <https://hdl.handle.net/10520/EJC27827>
- Dufour, M., Brunelle, N., Tremblay, J., Leclerc, D., Cousineau, -M.-M., Khazaal, Y., Légaré, -A.-A., Rousseau, M., & Berbiche, D. (2016). Gender difference in internet use and internet problems among Quebec high school students. *The Canadian Journal of Psychiatry*, 61(10), 663–668. <https://doi.org/10.1177/0706743716640755>
- Erwin, B. A., Turk, C. L., Heimberg, R. G., Fresco, D. M., & Hantula, D. A. (2004). The Internet: Home to a severe population of individuals with social anxiety disorder? *Journal of Anxiety Disorders*, 18(5), 629–646. <https://doi.org/10.1016/j.janxdis.2003.08.002>
- Fioravanti, G., & Casale, S. (2020). The active and passive use of Facebook: Measurement and association with Facebook addiction. *Journal of Psychopathology*, 20, 176–182. <https://doi.org/10.36148/2284-0249-329>
- Fioravanti, G., Dèttore, D., & Casale, S. (2012). Adolescent Internet addiction: Testing the association between self-esteem, the perception of Internet attributes, and preference for online social interactions. *Cyberpsychology, Behavior and Social Networking*, 15(6), 318–323. <https://doi.org/10.1089/cyber.2011.0358>

- Fioravanti, G., Flett, G., Hewitt, P., Rugai, L., & Casale, S. (2020). How maladaptive cognitions contribute to the development of problematic social media use. *Addictive Behaviors Reports*, 11, 100267. <https://doi.org/10.1016/j.abrep.2020.100267>
- Frison, E., & Eggermont, S. (2020). Toward an integrated and differential approach to the relationships between loneliness, different types of Facebook use, and adolescents' depressed mood. *Communication Research*, 47(5), 701–728. <https://doi.org/10.1177/0093650215617506>
- Gambo, S., & Özad, B. O. (2020). The demographics of computer-mediated communication: A review of social media demographic trends among social networking site giants. *Computers in Human Behavior Reports*, 2, 100016. <https://doi.org/10.1016/j.chbr.2020.100016>
- Gerson, J., Plagnol, A. C., & Corr, P. J. (2017). Passive and active Facebook use measure (PAUM): Validation and relationship to the reinforcement sensitivity theory. *Personality and Individual Differences*, 117, 81–90. <https://doi.org/10.1016/j.paid.2017.05.034>
- Goldin, P. R., Jazaieri, H., Ziv, M., Kraemer, H., Heimberg, R. G., & Gross, J. J. (2013). Changes in positive self-views mediate the effect of cognitive-behavioral therapy for social anxiety disorder. *Clinical Psychological Science*, 1(3), 301–310. <https://doi.org/10.1177/2167702613476867>
- Greenfeld, D., & Sutker, C. (1999). *Virtual addiction: Help for netheads, cyberfreaks, and those who love them*. New Harbinger Publications.
- Hassan, T., Alam, M. M., Wahab, A., & Hawlader, M. D. (2020). Prevalence and associated factors of internet addiction among young adults in Bangladesh. *Journal of the Egyptian Public Health Association*, 95(1), 3. <https://doi.org/10.1186/s42506-019-0032-7>
- Heimberg, R. G., Brozovich, F. A., & Rapee, R. M. (2010). A cognitive-behavioral model of social anxiety disorder: update and extension. In S. G. Hofmann, & P.M. Di Bartolo (Eds.), *Social anxiety: Clinical, developmental, and social perspectives*. New York, NY: Elsevier. <https://doi.org/10.1016/B978-0-12-375096-9.00015-8>
- Heimberg, R. G., Brozovich, F. A., & Rapee, R. M. (2014). A cognitive-behavioral model of social anxiety disorder. In S. G. Hofmann, & P. M. DiBartolo (Eds.), *Social anxiety: Clinical, developmental, and social perspectives* (3rd ed, pp. 705–728). Waltham, MA: Academic Press. <https://doi.org/10.1016/B978-0-12-394427-6.00024-8>
- Hofmann, S. G. (2007). Cognitive factors that maintain social anxiety disorder: A comprehensive model and its treatment implications. *Cognitive Behaviour Therapy*, 36(4), 193–209. <https://doi.org/10.1080/16506070701421313>
- Indian, M., & Grieve, R. (2014). When Facebook is easier than face-to-face: Social support derived from Facebook in socially anxious individuals. *Personality and Individual Differences*, 59, 102–106. <https://doi.org/10.1016/j.paid.2013.11.016>
- Iranmanesh, M., Foroughi, B., Nikbin, D., & Hyun, S. S. (2019). Shyness, self-esteem, and loneliness as causes of FA: The moderating effect of low self-control. *Current Psychology*, 1–12. <https://doi.org/10.1007/s12144-019-00465-w>
- Islam, M. A., & Hossin, M. Z. (2016). Prevalence and risk factors of problematic internet use and the associated psychological distress among graduate students of Bangladesh. *Asian Journal of Gambling Issues and Public Health*, 6(1), 11. <https://doi.org/10.1186/s40405-016-0020-1>
- Islam, M. S., Sujon, M. S. H., Tasnim, R., Ferdous, M. Z., Masud, J. H. B., Kundu, S., Mosaddek, A. S. M., Choudhuri, M. S. K., Kircaburun, K., & Griffiths, M. D. (2020). Problematic internet use among young and adult population in Bangladesh: Correlates with lifestyle and online activities during the COVID-19 pandemic. *Addictive Behaviors Reports*, 12, 100311. <https://doi.org/10.1016/j.abrep.2020.100311>
- Jahan, S. M., Hossain, S. R., Sayeed, U. B., Wahab, A., Rahman, T., & Hossain, A. (2019). Association between internet addiction and sleep quality among students: A cross-sectional study in Bangladesh. *Sleep and Biological Rhythms*, 17(3), 323–329. <https://doi.org/10.1007/s41105-019-00219-y>
- Karim, A. R., & Nigar, N. (2014). The internet addiction test: Assessing its psychometric properties in Bangladeshi culture. *Asian Journal of Psychiatry*, 10, 75–83. <https://doi.org/https://doi.org/10.1016/j.ajp.2013.10.011>

- Kimbrough, A. M., Guadagno, R. E., Muscanell, N. L., & Dill, J. (2013). Gender differences in mediated communication: Women connect more than do men. *Computers in Human Behavior*, 29(3), 896–900. <https://doi.org/10.1016/j.chb.2012.12.005>
- Krasnova, H., Wenninger, H., Widjaja, T., & Buxmann, P. (2013). Envy on Facebook: a hidden threat to users' life satisfaction? In *Proceedings of the 11th International Conference on Wirtschaftsinformatik (WI2013)*. Universität Leipzig, Germany. <https://boris.unibe.ch/id/eprint/47080>
- Lee, Y.-H., Ko, C.-H., & Chou, C. (2015). Re-visiting Internet addiction among Taiwanese students: A cross-sectional comparison of students' expectations, online gaming, and online social interaction. *Journal of Abnormal Child Psychology*, 43(3), 589–599. <https://doi.org/10.1007/s10802-014-9915-4>
- Lee, Z. W.-Y., & Cheung, C. M.-K. (2014). Problematic use of social networking sites: The role of self-esteem. *International Journal of Business and Information*, 9(2), 143.
- Leung, L. (2011). Loneliness, social support, and preference for online social interaction: The mediating effects of identity experimentation online among children and adolescents. *Chinese Journal of Communication*, 4(4), 381–399. <https://doi.org/10.1080/17544750.2011.616285>
- Macrynika, N., & Miranda, R. (2019). Active Facebook use and mood: When digital interaction turns maladaptive. *Computers in Human Behavior*, 97, 271–279. <https://doi.org/10.1016/j.chb.2019.02.012>
- Markovitzky, O., Anholt, G. E., & Lipsitz, J. D. (2012). Haven't we met somewhere before? The effects of a brief internet introduction on social anxiety in a subsequent face to face interaction. *Behaviour Research and Therapy*, 50(5), 359–365. <https://doi.org/10.1016/j.brat.2012.02.002>
- Mattick, R. P., & Clarke, J. C. (1998). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behaviour Research and Therapy*, 36(4), 455–470. [https://doi.org/https://doi.org/10.1016/S0005-7967\(97\)10031-6](https://doi.org/https://doi.org/10.1016/S0005-7967(97)10031-6)
- McCord, B., Rodebaugh, T. L., & Levinson, C. A. (2014). Facebook: Social uses and anxiety. *Computers in Human Behavior*, 34, 23–27. <https://doi.org/10.1016/j.chb.2014.01.020>
- McEwan, B. (2013). Sharing, caring, and surveilling: An actor-partner interdependence model examination of Facebook relational maintenance strategies. *Cyberpsychology, Behavior and Social Networking*, 16(12), 863–869. <https://doi.org/10.1089/cyber.2012.0717>
- McKenna, K. Y., Green, A. S., & Gleason, M. E. (2002). Relationship formation on the Internet: What's the big attraction? *Journal of Social Issues*, 58(1), 9–31. <https://doi.org/10.1111/1540-4560.00246>
- Miniwatts Marketing Group. (2021). *Internet World Stats: Uses and Population Statistics*. Retrieved June 23, from <https://www.internetworldstats.com/emarketing.htm>
- NapoleonCat. (2021). *Facebook users in Bangladesh*. Retrieved June 27, from <https://napoleontat.com/stats/facebook-users-in-bangladesh/2021/05>
- O'Day, E. B., & Heimberg, R. G. (2021). Social media use, social anxiety, and loneliness: A systematic review. *Computers in Human Behavior Reports*, 3, 100070. <https://doi.org/10.1016/j.chbr.2021.100070>
- Odacı, H., & Çıkrıkçı, Ö. (2014). Problematic internet use in terms of gender, attachment styles and subjective well-being in university students. *Computers in Human Behavior*, 32, 61–66. <https://doi.org/10.1016/j.chb.2013.11.019>
- Osman, A., Gutierrez, P. M., Barrios, F. X., Kopper, B. A., & Chiros, C. E. (1998). The social phobia and social interaction anxiety scales: Evaluation of psychometric properties. *Journal of Psychopathology and Behavioral Assessment*, 20(3), 249–264. <https://doi.org/10.1023/A:1023067302227>
- Pantic, I., Damjanovic, A., Todorovic, J., Topalovic, D., Bojovic-Jovic, D., Ristic, S., & Pantic, S. (2012). Association between online social networking and depression in high school students: Behavioral physiology viewpoint. *Psychiatria Danubina*, 24(1.), 90–93.
- Peter, J., Valkenburg, P. M., & Schouten, A. P. (2005). Developing a model of adolescent friendship formation on the Internet. *CyberPsychology & Behavior*, 8(5), 423–430. <https://doi.org/10.1089/cpb.2005.8.423>
- Pierce, T. (2009). Social anxiety and technology: Face-to-face communication versus technological communication among teens. *Computers in Human Behavior*, 25(6), 1367–1372. <https://doi.org/10.1016/j.chb.2009.06.003>

- Pontes, H. M., Taylor, M., & Stavropoulos, V. (2018). Beyond “Facebook addiction”: The role of cognitive-related factors and psychiatric distress in social networking site addiction. *Cyberpsychology, Behavior and Social Networking*, 21(4), 240–247. <https://doi.org/10.1089/cyber.2017.0609>
- Rapee, R. M., & Heimberg, R. G. (1997). A cognitive-behavioral model of anxiety in social phobia. *Behaviour Research and Therapy*, 35(8), 741–756. [https://doi.org/10.1016/S0005-7967\(97\)00022-3](https://doi.org/10.1016/S0005-7967(97)00022-3)
- Rauch, S. M., Strobel, C., Bella, M., Odachowski, Z., & Bloom, C. (2014). Face to face versus Facebook: Does exposure to social networking web sites augment or attenuate physiological arousal among the socially anxious? *Cyberpsychology, Behavior and Social Networking*, 17(3), 187–190. <https://doi.org/10.1089/cyber.2012.0498>
- Ryan, T., Chester, A., Reece, J., & Xenos, S. (2014). The uses and abuses of Facebook: A review of Facebook addiction. *Journal of Behavioral Addictions*, 3(3), 133–148. <https://doi.org/10.1556/JBA.3.2014.016>
- Saunders, P. L., & Chester, A. (2008). Shyness and the internet: Social problem or panacea? *Computers in Human Behavior*, 24(6), 2649–2658. <https://doi.org/10.1016/j.chb.2008.03.005>
- Sayed, A., Hassan, M. N., Rahman, M. H., El Hayek, S., Al Banna, M. H., Mallick, T., Hasan, A.-R., Meem, A. E., & Kundu, S. (2020). Facebook addiction associated with internet activity, depression and behavioral factors among university students of Bangladesh: A cross-sectional study. *Children and Youth Services Review*, 118, 105424. <https://doi.org/10.1016/j.childyouth.2020.105424>
- Schlenker, B. R., & Leary, M. R. (1982). Social anxiety and self-presentation: A conceptualization model. *Psychological Bulletin*, 92(3), 641. <https://doi.org/10.1037/0033-2909.92.3.641>
- Schlenker, B. R., & Leary, M. R. (1985). Social anxiety and communication about the self. *Journal of Language and Social Psychology*, 4(3–4), 171–192. <https://doi.org/10.1177/0261927X8543002>
- Segrin, C., & Kinney, T. (1995). Social skills deficits among the socially anxious: Rejection from others and loneliness. *Motivation and Emotion*, 19(1), 1–24. <https://doi.org/10.1007/BF02260670>
- Shaw, A. M., Timpano, K. R., Tran, T. B., & Joormann, J. (2015). Correlates of Facebook usage patterns: The relationship between passive Facebook use, social anxiety symptoms, and brooding. *Computers in Human Behavior*, 48, 575–580. <https://doi.org/10.1016/j.chb.2015.02.003>
- Smock, A. D., Ellison, N. B., Lampe, C., & Wohn, D. Y. (2011). Facebook as a toolkit: A uses and gratification approach to unbundling feature use. *Computers in Human Behavior*, 27(6), 2322–2329. <https://doi.org/10.1016/j.chb.2011.07.011>
- Spurr, J. M., & Stopa, L. (2002). Self-focused attention in social phobia and social anxiety. *Clinical Psychology Review*, 22(7), 947–975. [https://doi.org/10.1016/S0272-7358\(02\)00107-1](https://doi.org/10.1016/S0272-7358(02)00107-1)
- Statista. (2021). *Global social networks ranked by number of users 2021*. Statista. Retrieved June 23, from <https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/>
- Su, W., Han, X., Jin, C., Yan, Y., & Potenza, M. N. (2019). Are males more likely to be addicted to the internet than females? A meta-analysis involving 34 global jurisdictions. *Computers in Human Behavior*, 99, 86–100. <https://doi.org/10.1016/j.chb.2019.04.021>
- Tandoc, E. C., Jr, Ferrucci, P., & Duffy, M. (2015). Facebook use, envy, and depression among college students: Is facebooking depressing? *Computers in Human Behavior*, 43, 139–146. <https://doi.org/10.1016/j.chb.2014.10.053>
- Teppers, E., Luyckx, K., Klimstra, T. A., & Goossens, L. (2014). Loneliness and Facebook motives in adolescence: A longitudinal inquiry into directionality of effect. *Journal of Adolescence*, 37(5), 691–699. <https://doi.org/10.1016/j.adolescence.2013.11.003>
- Tosun, L. P., & Kaşdarma, E. (2020). Passive Facebook use and depression: A study of the roles of upward comparisons, emotions, and friendship type. *Journal of Media Psychology: Theories, Methods, and Applications*, 32(4), 165. <https://doi.org/10.1027/1864-1105/a000269>
- Tsai, H. F., Cheng, S. H., Yeh, T. L., Shih, -C.-C., Chen, K. C., Yang, Y. C., & Yang, Y. K. (2009). The risk factors of Internet addiction—a survey of university freshmen. *Psychiatry Research*, 167(3), 294–299. <https://doi.org/10.1016/j.psychres.2008.01.015>
- Valkenburg, P. M., & Peter, J. (2007). Preadolescents’ and adolescents’ online communication and their closeness to friends. *Developmental Psychology*, 43(2), 267. <https://doi.org/10.1037/0012-1649.43.2.267>
- Verduyn, P., Lee, D. S., Park, J., Shablack, H., Orvell, A., Bayer, J., Ybarra, O., Jonides, J., & Kross, E. (2015). Passive Facebook usage undermines affective well-being: Experimental and longitudinal

- evidence. *Journal of Experimental Psychology. General*, 144(2), 480. <https://doi.org/10.1037/xge0000057>
- Weidman, A. C., Fernandez, K. C., Levinson, C. A., Augustine, A. A., Larsen, R. J., & Rodebaugh, T. L. (2012). Compensatory internet use among individuals higher in social anxiety and its implications for well-being. *Personality and Individual Differences*, 53(3), 191–195. <https://doi.org/10.1016/j.paid.2012.03.003>
- Weinstein, A., Dorani, D., Elhadif, R., Bukovza, Y., Yarmulnik, A., & Dannon, P. (2015). Internet addiction is associated with social anxiety in young adults. *Annals of Clinical Psychiatry*, 27(1), 4–9.
- Ye, Y., & Lin, L. (2015). Examining relations between locus of control, loneliness, subjective well-being, and preference for online social interaction. *Psychological Reports*, 116(1), 164–175. <https://doi.org/10.2466/07.09.PR0.116k14w3>
- Young, N. L., Kuss, D. J., Griffiths, M. D., & Howard, C. J. (2017). Passive Facebook use, Facebook addiction, and associations with escapism: An experimental vignette study. *Computers in Human Behavior*, 71, 24–31. <https://doi.org/10.1016/j.chb.2017.01.039>
- Zsido, A. N., Arato, N., Lang, A., Labadi, B., Stecina, D., & Bandi, S. A. (2020). The connection and background mechanisms of social fears and problematic social networking site use: A structural equation modeling analysis. *Psychiatry Research*, 292, 113323. <https://doi.org/10.1016/j.psychres.2020.113323>