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Peer Cyber-Victimization and Addictive Phone Use: Indirect Effects of Depression and Anxiety Among College Students

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Abstract

While social media offer opportunities for young adults, including college students, to maintain relationships and seek social support, concerns have been raised about negative social interactions, such as cyber-victimization, and the role that cyber-victimization may play in exacerbating excessive or problematic phone use. The current study examined the association between peer cyber-victimization and addictive phone use, and the ways in which anxiety and depressive symptoms indirectly affect that relationship. To examine these relations, 540 undergraduate students from a Midwestern university in the United States (66% female, 82% White, 79% between 18 to 20-years-old) completed a computer-based survey that measured peer cyber-victimization, addictive phone use, depressive symptoms, and anxiety. The results showed a significant positive association between peer cyber-victimization and addictive phone use. Anxiety, but not depressive symptoms, had a significant indirect effect on the association between peer cyber-victimization and addictive phone use. The findings indicate that experiencing peer cyber-victimization may increase one's likelihood to experience addictive phone use, potentially through experiencing anxiety. Longitudinal studies are needed to better understand directionality of the relations among these constructs.

Keywords: cyber-victimization; addictive phone use; anxiety; depression; young adults

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Introduction

Smartphones have changed the ways in which individuals communicate and connect. The demographic group with the highest rates of smartphone ownership are college students and other young adults. Indeed, in the United States, 96% of 18- to 29-year-olds own a smartphone, with 84% of young adults using at least one type of social media (e.g., YouTube, Facebook, Instagram; Pew Research Center, 2021a, 2021b). Mobile devices, such as smartphones, have facilitated greater frequency of social media use among older adolescents (Lenhart, 2015). Further, young adults are higher utilizers of multiple types of social media, with 18- to 24-year-olds more likely to use Instagram and Snapchat, compared to other adults (Perrin & Anderson, 2019).

While the use of smartphones and social media can be beneficial (e.g., facilitates easier communication with loved ones; helps maintain relationships; allows individuals to cultivate and share meaningful content; David & Roberts,

2021; Kim & Kim, 2017, Rideout & Robb, 2018), as with any form of social interaction, there can be conflict and negative interactions. In particular, peer cyber aggression (i.e., perpetration of aggressive behavior online) and peer cyber-victimization (i.e., experiencing bullying) has received most empirical attention as a downside to social media consumption. Peer cyber-victimization is the focus of the current study and is defined as experiencing repeated intentional harm inflicted through the use of electronic devices (Englander, 2017; Patchin & Hinduja, 2006). Peer cyber-victimization may include others spreading rumors online or through electronic devices, posting mean or hurtful comments/pictures/videos, and/or creating media content (e.g., websites) that is hurtful. The prevalence of cyber-victimization often ranges widely, particularly given the different definitions of cyber-victimization that exist. Relatively recent estimates in the United States suggest that approximately 15% of college students have experienced any type of cyber-victimization in college (Selkie et al., 2015). Similar rates have been reported in countries outside of the United States (e.g., Cénat et al., 2019; Skilbred-Fjeld et al., 2020).

Experiencing peer cyber-victimization can negatively impact victims' mental health, and is a type of aggression that individuals may not get immediate relief. Given the omnipresence of technology in college students' lives, cyber-victimization can be challenging to avoid or prevent, especially if the perpetrator is unknown or anonymous (Slonje et al., 2013; Watts et al., 2017). Peer cyber-victimization among college students may be especially problematic, as individuals become increasingly independent and there is less adult support and monitoring during this time. Indeed, collaborative parental monitoring of technology use is a strong protective factor for adolescents experiencing cyber-victimization (Elsaesser et al., 2017). Further, young adulthood (including college students) is a period associated with heightened risk for mental health problems, including depression and anxiety (National Institute of Mental Health, 2019).

Poorer mental health has been a growing concern for college students due to higher rates of anxiety and depression being reported in recent years (Duffy et al., 2019). According to several different studies, cyber-victimization can have an influence on the development of anxiety and depression, as well as other negative mental health outcomes among college students (e.g., Kokkinos et al., 2014; Skilbred-Fjeld et al., 2020; Wang et al., 2019). In a longitudinal study, Wright (2016) found that cyber-victimization experienced by undergraduate students contributed to greater anxiety, depression, and suicidal ideation four years later. In another study with French undergraduate students, results indicated that experiencing some type of cyber-victimization in college led to more reported suicidal ideation and suicide attempts compared to individuals who had not experienced cyber-victimization (Cénet et al., 2019). Taken together, cyber-victimization prevalence is relatively high and experiencing cyber-victimization may have a sustained impact on college students' mental health.

Peer Cyber-Victimization and Addictive Phone Use

Another potential outcome of experiencing peer cyber-victimization is a heightened risk for problematic phone use. As has been proposed by Billieux et al. (2015), there are three types of problematic phone use: addictive, risky, and antisocial. In this study, we are particularly focused on addictive phone use, defined as excessive phone use, measured by symptoms such as psychosocial consequences due to use, major conflict or problems due to use, preoccupation with using one's phone, and phone use to escape or relieve negative affect (among others, see Domoff et al., 2020) that interferes with an individual's functioning. In other words, addictive phone use is a type of problematic use that entails dysregulated (i.e., trouble controlling) use of smartphones that leads to impairment in functioning. Although addiction to applications offered on smartphones (e.g., gaming, social media, entertainment videos, etc.) is not listed in the Diagnostic and Statistical Manual, 5th edition (DSM-5), the closest corollary syndrome is Internet Gaming Disorder (IGD) whose symptoms reflect a behavioral addiction to online or offline games. In line with prior research, we use the symptoms from the IGD, but applied to smartphones to capture "dysregulated" or addictive use (as measured by the Addictive Pattern of Use [APU] scale; Domoff et al., 2020).

Prior research has found a positive relation between traditional peer victimization (i.e., physical, verbal, or relational victimization not experienced through electronic devices) and mobile phone addiction (Liu et al., 2020), as well as with related constructs, including internet addiction (Hsieh et al., 2016; Jia et al., 2018) and pathological internet use (Strittmatter et al., 2014). In their sample of Chinese adolescents, Liu et al. (2020) found peer victimization to be positively associated with mobile phone addiction. Similarly, Feijóo et al. (2021) found adolescents in Spain who were classified as cyber-victims were more likely to engage in problematic internet use compared to adolescents not involved in cyberbullying. According to self-determination theory (Ryan & Deci, 2000), targets of cyberaggression may not have their psychological needs met, particularly the need for positive

or close relationships with other individuals (Santurio et al., 2020), and may turn to excessive or problematic phone use to get their needs met (Chen et al., 2021; Hong et al., 2019). Related, targets of peer cyber-victimization may attempt to utilize technology and the internet to reduce the distress and anxiety they feel as a result of being victimized (Gámez-Guadix et al., 2013; Liu et al., 2020).

Prior studies have focused on examining the relation between cyber-victimization and problematic phone use—and related constructs, including traditional victimization and problematic internet use—among adolescents outside of the United States (Chen et al., 2021; Liu et al., 2020). There has been limited research investigating addictive patterns of phone use and cyber-victimization among college students. In one study, a significant association emerged, with greater smartphone addiction associating with higher perpetration of cyberbullying among Saudi university students (Qudah et al., 2019). In their longitudinal study of Chinese adolescents, Chen et al. (2021) found a bidirectional relation between mobile phone addiction and peer victimization. Chen et al. (2021) also found that depression mediated the association between peer victimization and smartphone addiction in their sample. We seek to replicate and expand on this study with college students in the United States, a population for whom peer cyber-victimization experiences is less known and the decrease in adult support and monitoring of technology use may make this a developmental period with heightened risk.

Indirect Effects of Anxiety and Depressive Symptoms

A potential mechanism linking peer cyber-victimization to addictive phone use may be through anxiety and depressive symptoms. Billieux et al. (2015)'s Pathway Model for Problematic Mobile Phone Use outlines three separate pathways that may lead to problematic (i.e., addictive, antisocial, or risky) phone use. In their theoretical model, different risk factors and types of phone use are linked to each of these domains of problematic use. Germane to the current study is the Excessive Reassurance Pathway, which posits that dysregulated patterns of smartphone use emerge as a result of heightened concern regarding reassurance seeking which leads to symptoms of phone addiction (Billieux et al., 2015). As such, Billieux et al. (2015) outline the risk factors for this pathway which include emotional instability and anxiety symptoms. Indeed, a systematic review of the literature on correlates of smartphone addiction provides support for this pathway (Elhai et al., 2017), along with recent research linking depression and anxiety to phone addiction (e.g., Elhai et al., 2018; Matar Boumosleh & Jaalouk, 2017). A recent study with Chinese undergraduate students during the COVID-19 pandemic also supports this, finding high levels of problematic smartphone use correlated with depression and anxiety (Jin et al., 2021). Given the impact that peer cyber-victimization has on already identified predictors of smartphone addiction (i.e., depression and anxiety; Fredrick et al., 2021; Martínez-Monteagudo et al., 2020), it is likely that peer cyber-victimization may emerge as an independent risk factor for smartphone addiction. For example, Li et al. (2019) found depression and anxiety to mediate the relation between peer victimization and internet addiction in their cross-sectional study with Chinese adolescents and Chen et al. (2021) found depression to mediate the bidirectional association between peer victimization and smartphone addiction in Chinese adolescents in their longitudinal study.

The Current Study

Given the rates of cyber-victimization, and its impact on mental health of college students, our current study aims to examine additional risks associated with experiencing peer cyber-victimization in this population. In particular, limited research exists investigating the links between peer cyber-victimization and addictive phone use, and whether anxiety and depressive symptoms play a role in the potential relation between peer cyber-victimization and addictive phone use. However, theoretical models of problematic mobile phone use (e.g., Billieux et al., 2015) provide support for the following hypotheses, to be tested in our current study:

H1: There will be a significant positive association between peer cyber-victimization and addictive phone use.

H2: There will be an indirect effect of anxiety in the relation between peer cyber-victimization and addictive phone use, such that peer cyber-victimization will be positively related to addictive phone use through higher levels of anxiety.

H3: There will be an indirect effect of depressive symptoms in the relation between peer cyber-victimization and addictive phone use, such that peer cyber-victimization will be positively related to addictive phone use through higher levels of depressive symptoms.

Prior research has found a positive association among traditional peer victimization and smartphone addiction (Chen et al., 2021; Liu et al., 2020) and constructs related to smartphone addiction, such as internet addiction (Jia et al., 2018; Li et al., 2019; Strittmatter et al., 2014). Thus, we predict there will be a positive association among peer cyber-victimization and smartphone addiction. Further, based on prior longitudinal research showing cyber-victimization to predict higher levels of anxiety and depressive symptoms (Fredrick et al., 2022), especially among college students (e.g., Wright, 2016) and internalizing problems to predict smartphone addiction (Zhou et al., 2021), we hypothesize that peer cyber-victimization will be positively related to addictive phone use through higher levels of anxiety and depressive symptoms (Li et al., 2019). Prior research has found women and younger individuals to show higher levels of problematic phone use (Alhassan et al., 2018; Baloğlu et al., 2020); thus, gender and age were included as covariates to control for their effects on addictive phone use.

Methods

Participants

A total of 540 students from a rural Midwestern university in the United States participated in the study. Only 525 participants were included in the current study (see Procedures). Over half of the participants were female (66%) and 66% were between 18- and 19-years-old. Regarding race/ethnicity, 82% of participants identified as White, 13% as Black or African American, 4% as Hispanic, 3% multiracial/biracial, 2% Asian, and < 1% American Indian or Alaska Native. See Table 1 for additional participant demographics.

Table 1. *Participant Characteristics.*

Variable	*n*	%
Gender		
Male	175	33%
Female	347	66%
Gender variant/Non-binary	3	1%
Age		
18	237	45%
19	111	21%
20	68	13%
21	49	9%
22	27	5%
23+	33	6%
Race/ethnicity		
White	434	83%
Black/AA	68	13%
Hispanic/Latino	19	4%
Asian/PI	10	2%
Native Hawaiian or Other Pacific Islander	2	< 1%
Multiracial	15	3%
Year in School		
Freshman	269	51%
Sophomore	88	17%
Junior	83	16%
Senior	78	15%
Other	7	1%

Note. Percentage of respondents summed to greater than 100% for the race/ethnicity variable because participants could select more than one applicable racial/ethnic group. The “other” category for year in school includes students at large.

Procedures

Participants were recruited utilizing convenience sampling from a rural Midwestern university through the Psychology Department online subject pool system during the 2017–2018 academic year. Participants were offered course credit for the completion of the survey and all were enrolled in an undergraduate level psychology course. A total of 540 students completed the anonymous computer-based survey. Institutional Review Board (IRB) approval was obtained from the 2nd and 3rd authors' university prior to data collection. All university IRB procedures and ethics with participants were followed. The first page of the survey provided a description of the study and requirements for participation (including potential risks, anonymity of responses, and that participating in the study was voluntary and they could discontinue the survey or withdraw consent at any time with no penalty). The participant provided informed consent after reading this description and prior to completing the survey. The survey required participants to answer all items; however, participants could discontinue the survey at any time. Only participants that indicated they have a smart phone (*n* = 534) were included in analyses. Further, 10 participants endorsed *true* on the validity item on the survey (*I have not eaten in the past month)* and were excluded from analyses. Thus, the final sample consisted of 525 participants.

Measures

Addictive Phone Use

The Addictive Patterns of Use (APU) scale utilizes criteria for disordered use of other types of screen media (e.g., Internet Gaming Disorder, American Psychiatric Association, 2013; Problematic Media Use Measure, Domoff et al., 2019), to assess addictive smartphone use (Domoff et al., 2020). The APU scale consists of nine items, including *During the last year, how often have you experienced serious conflicts with family, friends, or partner because of your phone use?* and *During the last year, how often have you felt restless or tense when you were unable to use your phone?* Participants responded on a 5-point Likert scale, with 1 = *Never* to 5 = *Always*. An additional item after these nine items requests the respondents to indicate which applications (apps) they use the most to indicate which features are of most concern (e.g., social media/messaging, gaming). In the current study, the vast majority (i.e., 85%) of participants indicated social media and messaging were their most commonly used apps. Although prior research has utilized the total score in their analyses (e.g., Domoff et al., 2021; Nesi et al., 2022), Domoff et al. (2020) found support for a two-factor model including a Cognitive-Emotional Symptoms (5 items) factor and a Social Problems (4 items) factor. Cronbach's alphas for the current study for the Cognitive-Emotional Symptoms, Social Problems, and Total scales were .86, .84, and .83, respectively. We tested a second-order CFA in order to capture both the two factors and the total score in our latent model. A second-order CFA conducted with the current sample initially indicated adequate fit to the data, $\chi^2(26) = 201.49$, $p < .001$, RMSEA = .11, 90% CI [.10, .13], CFI = .93, TLI = .90, SRMR = .08. Modification indices indicated that one of the items (*Have you spent less time with friends, or doing other activities, in order to use your phone?*) had high loadings on both the Social Problems and Cognitive-Emotional Symptoms factors. All other items on the Social Problems factor assess conflict with friends and family due to phone use and it's often the case that individuals use their phones to interact with peers. Thus, this item was deleted from the model. Model fit indices then indicated good fit to the data, $\chi^2(19) = 87.13$, $p < .001$, RMSEA = .08, 90% CI [.07, .10], CFI = .97, TLI = .95, SRMR = .05. Standardized factor loadings ranged from .75 to .88 for the three items measuring Social Problems and from .54 to .83 for the five Cognitive-Emotional Symptoms items. The Social Problems and Cognitive-Emotional Symptoms standardized factor loadings were .77 and .66, respectively.

Peer Cyber-Victimization

The Cyberbullying and Online Aggression Survey Instrument (Hinduja & Patchin, 2015) was utilized to measure participants' experiences with peer cyber-victimization. This is a 21-item measure that utilizes a 4-point Likert scale *(Never, Once, A Few Times, Many Times)* and asks participants to report their experiences of peer cyberaggression and victimization in the past 30 days after reading a definition of peer cyberaggression and victimization. The definition indicates that aggressive behavior must be repetitive and intentional to be considered bullying. Only the 10-item victimization scale was used for the current study (α = .86) to assess the frequency in which participant were targets of peer cyber-victimization (e.g., posting hurtful comments and pictures online or through electronic devices, physical threats, rumor spreading, damaging reputations or relationships by pretending to be someone else). A CFA conducted with the current sample initially indicated poor fit to the data $\chi^2(35) = 74.39$, $p < .001$,

RMSEA = .05, 90% CI [.03, .06], CFI = .87, TLI = .83, SRMR = .06. Examination of factor loadings indicated low loadings for the item assessing participants' experiences with someone creating a hurtful web page about them (.43, p = .020 and less than 1% of the sample indicated experiencing this type of cyberbullying; thus, this item was deleted from the model. Modification indices also indicated a relation between two items that measured being threatened online or through texting, and two items that measured having hurtful videos posted and having someone else pretending to be them online; each pair of items were allowed to correlate. Model fit then indicated acceptable fit to the data, $\chi^2(25) = 28.47$, $p = .287$, RMSEA = .02, 90% CI [.00, .04], CFI = .99, TLI = .98, SRMR = .04. Standardized factor loadings ranged from .35 to .77.

Depressive Symptoms and Anxiety

The Depression Anxiety and Stress Scale (DASS-21; Henry & Crawford, 2005) measures internalizing symptoms including 7 items related to depressive symptoms (e.g., *I couldn't seem to experience any positive feeling at all*), 7 items related to anxiety (e.g., *I found it difficult to relax*), and 7 items related to stress (these items not included in current study). All items are rated on a 4-point scale ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much or most of the time*). Only the Depression and Anxiety subscales were utilized in the current study; prior research has found evidence of strong internal consistency for both the Depression (.96) and Anxiety (.95) subscales (Page et al., 2007). In the current sample, confirmatory factor analysis indicated good fit to the data for both the Depression, $\chi^2(14) = 60.43$, $p < .001$, RMSEA = .08, 90% CI [.06, .10], CFI = .97, TLI = .96, SRMR = .03, and Anxiety, $\chi^2(14) = 45.88$, $p < .001$, RMSEA = .07, 90% CI [.05, .09], CFI = .97, TLI = .95, SRMR = .03, subscales. Standardized factor loadings ranged from .52 to .88 and .29 to .78 for the Depression and Anxiety subscales, respectively. Cronbach's alphas for the current study for the Depression and Anxiety subscales were .91 and .84, respectively.

Data Analyses

Structural equation modeling (SEM) using Mplus 8.3 (Muthén & Muthén, 2019) was utilized for the current study. IBM SPSS Statistics 25 was utilized for correlations and descriptive statistics among the scales. The effect of Gender (females coded 0, males 1) and Age on Addictive Phone Use was controlled for in all models. To examine the first study aim, Peer Cyber-victimization (exogenous latent variable), Addictive Phone Use (endogenous latent variable), Gender (covariate), and Age (covariate) were included in analyses. To examine the indirect effects of Depressive Symptoms and Anxiety (second and third study aims), these variables were added to the model as endogenous latent variables. Each latent variable was measured via their respective subscale items (as previously described), with the exception of Gender and Age which were observed variables. Model fit was evaluated by examining chi-square statistics, the root mean square error of approximation (RMSEA), the comparative fit index (CFI), and the Tucker Lewis index (TLI). RMSEA values below .08 and CFI/TFI values above .90 is considered adequate model fit (Hooper et al., 2008). Although it is desirable to have a nonsignificant chi-square statistic, the chi-square can be sensitive to large sample sizes; thus, additional fit indices were utilized (Hooper et al., 2008). There were no missing data due to the survey requiring responses to all items. Bootstrapping was utilized to test for direct and indirect effects, where small samples are drawn from the larger sample, analyzed, and replaced (1,000 times for the current study). Bootstrapping does not make assumptions regarding sample distribution. Effects are significantly different from zero when the bootstrapped confidence interval (Boot CI) does not include zero.

Results

Means, standard deviations, and correlations among each of the scales are presented in Table 2. Approximately 16.4% of participants reported experiencing at least one form of cyber-victimization in the past 30 days.

Table 2. *Means, Standard Deviations, and Bivariate Correlations.*

	1	2	3	*M*	*SD*	*N*
1. Peer Cyber-victimization range: 0–18				0.56	1.95	525
2. Addictive Phone Use range: 1–5	.18**			2.28	0.77	525
3. Depressive Symptoms range: 0–21	.15**	.27**		6.06	5.22	525
4. Anxiety range: 0–21	.15**	.31**	.72**	5.68	4.73	525

Note. Total scores were calculated for Peer Cyber-victimization, Depressive Symptoms, and Anxiety. Mean scores were calculated for Addictive Phone Use. $^{**}p < .01$.

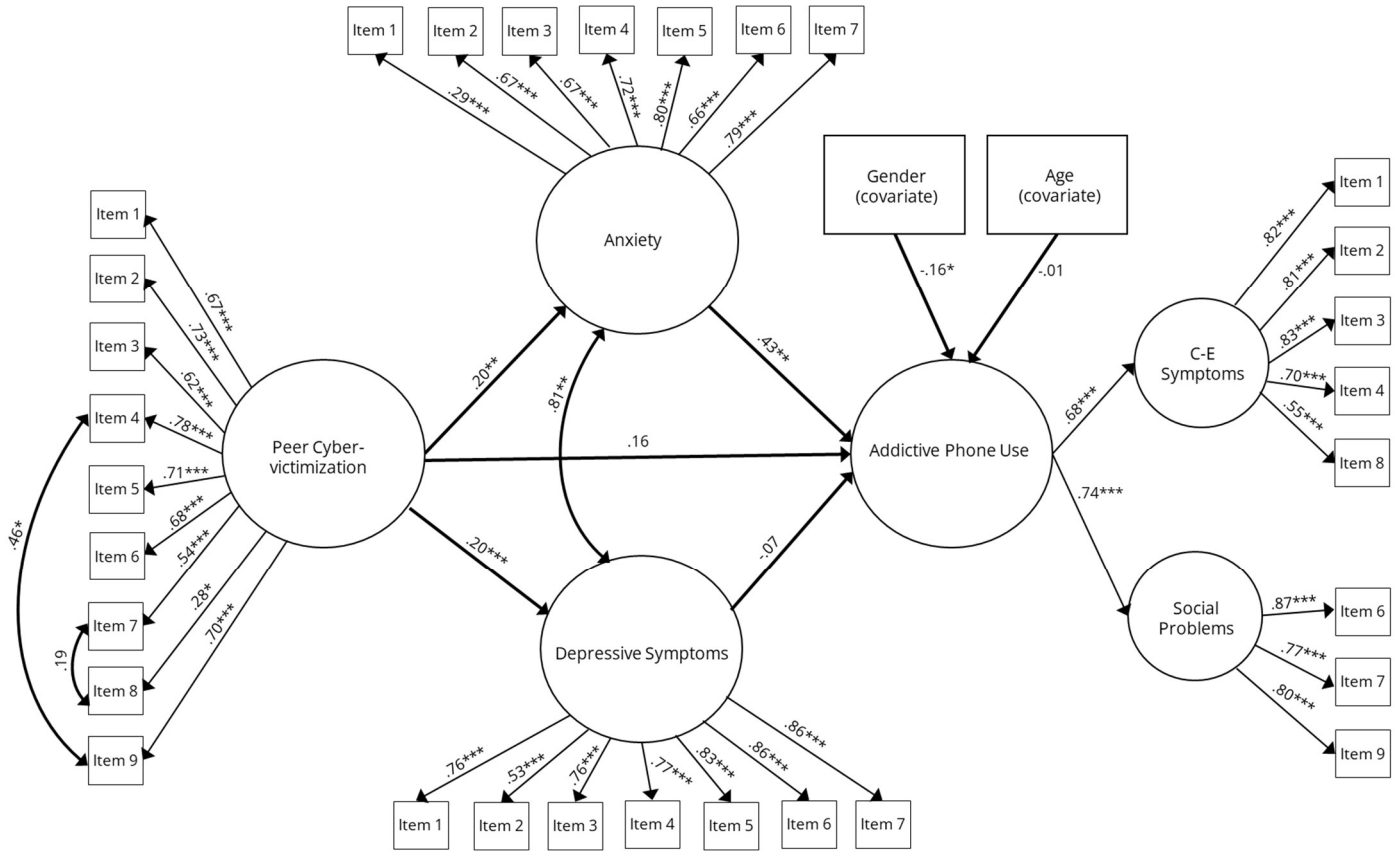
Peer Cyber-Victimization and Addictive Phone Use

To examine the first aim of the study, Peer Cyber-victimization was included in the model as an exogenous variable and Addictive Phone Use was included as the endogenous variable; Gender and Age were also included as covariates. Fit indices were within their respective recommended ranges for acceptable model fit, $\chi^2(148) = 468.48$, $p < .001$, RMSEA = .06, CFI = .92, 90% CI [.06, .07], TLI = .91, SRMR = .06. As expected, path coefficients indicated that Peer Cyber-victimization was significantly and positively associated with Addictive Phone Use, $\beta = .22$, $B = .47$, 95% Boot CI = [.20, .85], $p = .003$. Gender was also significantly associated with Addictive Phone Use, $\beta = -.18$, $B = -.21$, 95% Boot CI [−.33, −.09], $p < .001$. Age was not associated with Addictive Phone Use, $\beta = .02$, $B = .01$, 95% Boot CI [−.04, .05], $p = .781$. Peer Cyber-victimization, Gender, and Age accounted for 9% of the variance in Addictive Phone Use ($R^2 = .09$).

Indirect Effects of Anxiety and Depressive Symptoms

To examine the indirect effects of Anxiety and Depressive Symptoms in the relation between Peer Cyber-victimization and Addictive Phone Use (study aim two and three), data were fit to the model depicted in Figure 1.

Figure 1. *Standardized Estimates of the Direct Effects of Anxiety and Depressive Symptoms in the Relation Between Peer Cyber-Victimization and Addictive Phone Use.*



Note. C-E = Cognitive-Emotional. $^{***}p < .001$, $^{**}p < .01$, $^{*}p < .05$.

Fit indices were within their respective recommended ranges for acceptable model fit, $\chi^2(485) = 1{,}186.24$, $p < .001$, RMSEA = .05, 90% CI (.05, .06), CFI = .92, TLI = .91, SRMR = .06. As predicted, there was a significant indirect effect of Anxiety in the relation between Peer Cyber-victimization and Addictive Phone Use, $B = .16$, Boot SE = .08, $p = .036$, 95% BC Boot CI [.05, .41]. The indirect effect of Depressive Symptoms in the relation between Peer Cyber-victimization and Problematic Phone Use was not significant, $B = -.03$, Boot SE = .05, $p = .638$, 95% BC Boot CI [−.13, .09]. The total indirect effect of both Anxiety and Depressive Symptoms was significant, $B = .14$, Boot SE = .06, $p = .026$, 95% BC Boot CI [.05, .31], and the total effect on Addictive Phone Use was also significant, $B = .45$, Boot SE = .19, $p = .020$, 95% BC Boot CI [.13, .91].

Results also revealed a significant and positive relation between Anxiety and Addictive Phone Use ($B = .88$, $p = .010$), Anxiety and Peer Cyber-victimization ($B = .19$, $p = .017$), and Depressive Symptoms and Peer Cyber-victimization ($B = .41$, $p = .001$). There was also a negative association between Addictive Phone Use and Gender ($B = -.18$, $p = .004$). See Table 3 for standardized and unstandardized path coefficients, standard errors, and 95% bias corrected bootstrapped confidence intervals for all direct effects. The model explained 4% of the variance in Anxiety, 4% of the variance in Depressive Symptoms, and 22% of the variance in Addictive Phone Use.

Table 3. *Direct Effects of Peer Cyber-Victimization, Anxiety, and Depressive Symptoms on Addictive Phone Use.*

	β	*B*	SE	95% BC Boot CI		*p*
				Lower	Upper	
Addictive Phone Use						
Peer Cyber-victimization	.16	0.31	0.20	−0.06	0.75	.121
Anxiety	.43	0.88	0.34	0.27	1.57	.010
Depressive Symptoms	−.07	−0.06	0.13	−0.28	0.21	.622
Gender (covariate)	−.16	−0.18	0.06	−0.30	−0.05	.004
Age (covariate)	−.01	−0.00	0.02	−0.04	0.02	.855
Anxiety						
Peer Cyber-victimization	.20	0.19	0.08	0.08	0.39	.017
Depressive Symptoms						
Peer Cyber-victimization	.20	0.41	0.12	0.20	0.68	.001

Note. SE = Standard Error; BC Boot CI = Bias Corrected Bootstrapped Confidence Interval.

Discussion

Prior research has established that cyber-victimization is related to a myriad of mental health problems, including depression and anxiety, among youth and adults, including college students (Skilbred-Fjeld et al., 2020; Wang et al., 2019; Wright, 2016). Less research has focused on how cyber-victimization impacts phone use that is problematic in nature and that leads to negative consequences for the phone user. The current study aimed to fill this gap in the literature by testing the hypothesis that experiencing peer cyber-victimization is related to addictive phone use among college students. Further, through the lens of theoretical models of problematic mobile phone use (Billieux et al., 2015), we also tested the indirect effects of anxiety and depressive symptoms between peer cyber-victimization and addictive phone use. Results revealed partial support for our hypotheses. Peer cyber-victimization was significantly and positively associated with addictive phone use and there was an indirect effect of anxiety, but not depressive symptoms, in this relation while controlling for gender and age.

Approximately 16.4% of participants in the current study reported experiencing at least one form of peer cyber-victimization in the 30 days prior to completing the survey. This is consistent with prior studies examining cyber-victimization among college students, which have reported prevalence rates between 8% to 15% (Selkie et al., 2015; Tennant et al., 2015). Although these rates are slightly lower than those reported by adolescents, peer cyber-victimization may be particularly problematic among college students as college is a period in which there is heightened risk for depression and anxiety (National Institute of Mental Health, 2019). Thus, it is important to examine the relation between experiences of peer cyber-victimization and problematic phone use, particularly among U.S. college students.

Peer Cyber-Victimization and Addictive Phone Use

College students experiencing peer cyber-victimization may be at heightened risk for problematic phone use, particularly with the lack of adult monitoring on devices during this developmental period. Although the current study was cross-sectional in nature and cannot determine directionality, findings support prior studies which have found peer relationship problems (e.g., peer victimization, cyber-victimization) to be associated with risk for problematic phone use (e.g., Liu et al., 2020), as well as related constructs including internet addiction and problematic internet use (Feijóo et al., 2021; Hsieh et al., 2016; Jia et al., 2018; Strittmatter et al., 2014). Current findings also support the Excessive Reassurance Pathway for the Addictive Pattern of Use (Billieux et al., 2015), such that college students that experience peer cyber-victimization may engage in phone use to relieve negative affect or cope with distress associated with cyber-victimization. For example, college students may seek reassurance or negative affect alleviation via phone use excessively and to the point of interfering of functioning.

Although findings revealed a positive association between peer cyber-victimization and addictive phone use, according to Cohen's (1988) guidelines for interpreting R^2 (i.e., small [.02], medium [.13], and large [.26]), the effects should be interpreted as small to moderate, with cyber-victimization, gender, and age only accounting for 8% of the variance in addictive phone use (R^2 = .08). Further, the strength of the association between peer cyber-victimization and addictive phone use found in the current study (r = .18) is similar to other studies. For example, Martínez-Ferrer et al. (2021) found a moderate association between cyber-victimization and problematic use of social networking sites (r = .23) in their sample of 2,011 adolescents and Gámez-Guadix et al. (2013) also found a moderate association between cyber-victimization and problematic internet use (rs = .28 and .23 for time one and two, respectively) in their sample of 845 adolescents. Thus, it is highly likely that other factors besides peer cyber-victimization may contribute to heightened risk for problematic phone use.

Indirect Effects of Depressive Symptoms and Anxiety

Partially in line with our hypotheses, current findings revealed a significant indirect effect of anxiety in the relation between peer cyber-victimization and addictive phone use. This finding supports an emotion dysregulation pathway linking peer cyber-victimization to negative consequences related to phone use. It is possible that rumination and/or emotional reactivity may drive some aspects of addictive phone use—with peer cyber-victimization as a likely risk factor—which is consistent with Billieux et al. (2015)'s Pathway Model for Problematic Mobile Phone use (i.e., the Excessive Reassurance Pathway leading to Addictive Pattern of Use) and prior research (Elhai et al., 2017). Young adults with recent peer cyber-victimization experiences may have heightened concern or reactivity to online social interactions, particularly if they have not used adaptive coping skills in response to peer cyber-victimization. For example, it is probable that salient negative social interactions (i.e., peer cyber-victimization) may contribute to feeling anxious or distressed about future online social interactions. Elhai et al. (2018) found rumination to mediate the relation between depression and social anxiety and problematic smartphone use among college students. Young adults may be hyper-focused on the next negative social interaction (e.g., a hurtful or humiliating post about them) or concerned about being left out on social media. Experiences of peer cyber-victimization are unique in that a perpetrator could post a hurtful message, picture, or video without the victim immediately realizing it—this hurtful post could reach a wide audience before the victim or target is even aware of it. Thus, a prior experience with peer cyber-victimization could result in addictive phone use as an attempt to relieve anxiety. It should also be noted that effect sizes were medium to large in predicting addictive phone use (R^2 = .20). This is in contrast to the small effect found in the association between peer cyber-victimization and addictive phone use, suggesting that college students' anxiety and depressive symptoms have a more robust relation with addictive phone use than peer cyber-victimization.

Our hypothesis regarding an indirect effect of depressive symptoms was not supported in the current study. Prior research has examined the relation between problematic smartphone addiction and anxiety and depressive symptoms in separate models (e.g., Jin et al., 2021; Matar Boumosleh & Jaalouk, 2017). Although there was a significant bivariate correlation between addictive phone use and depressive symptoms (r = .27) in the current study, depressive symptoms were not significantly related to addictive phone use when peer cyber-victimization, anxiety, gender, and age were included in the model. Although Chen et al. (2021) found depression to mediate the link between peer victimization and smartphone addiction, anxiety was not included in their model. It may be that when including both anxiety and depression in the same model, anxiety is a more robust predictor of smartphone addiction compared to depression. Further research is needed to examine how anxiety and depressive symptoms

may differ in their relation to problematic phone use. It is also possible that there is a bidirectional relation between anxiety and depressive symptoms and addictive phone use, such that internalizing distress drives addictive and/or problematic use, which then further exacerbates distress. This would be consistent with findings from Chen et al. (2021) longitudinal study which found a reciprocal relation between peer victimization and mobile phone addiction in a cross-lagged panel model across three waves of data. Prior longitudinal research have also found support for a symptoms-driven model of cyber-victimization, with depression and anxiety predicting cyber-victimization (Holfeld & Mishna, 2019), as well as bidirectional relations between depression and cyber-victimization (Fredrick et al., 2022; Rose & Tynes, 2015). It is clear that more studies are needed with rigorous longitudinal designs to examine directionality of the relations among cyber-victimization, addictive phone use, and internalizing problems.

Limitations and Future Directions

The present study has limitations, including the use of convenience sampling (i.e., participants were recruited through the university's Psychology Department online subject pool system); thus, generalizability of the results is limited. The current sample included an overrepresentation of female freshman and sophomore students likely due to the student demographics which comprise psychology courses that require research study participation for course credit. Further, the sample largely consisted of White students (83%). According to the most recent data from National Center for Education statistics (2021), 53% of Fall 2019 undergraduate enrollment consisted of White students, 13% Black, 22% Hispanic, 7% Asian/Pacific Islander, < 1% American Indian/Alaska Native, and 4% Multiracial. Thus, our sample consisted of an overrepresentation of White students and an underrepresentation of Hispanic students. This is an important limitation that should be considered in future research as more diverse college student samples are needed to ensure adequate representation across age, gender, and race/ethnicity. Another limitation is that the data were cross-sectional; causal inferences should not be made. In other words, temporal precedence of the variables is not confirmed with this study. For example, it is possible that depressive symptoms and anxiety co-occurred with ones' experiences of peer cyber-victimization. Chen et al. (2021) recently found a reciprocal relation between peer victimization and mobile phone addiction in their sample of Chinese adolescents. A reciprocal relation between cyber-victimization and problematic phone use could not be tested in the current study due to the cross-sectional design; thus, future research should use a longitudinal design with a larger and more diverse sample to address these limitations. Another limitation is that the age of participants was collected via a multiple-choice type item and thus, the maximum age is unknown and we are not able to provide information on the mean and standard deviation of participants' age levels. Finally, effect sizes reported in the current study were only small to medium in magnitude, suggesting that there may be more robust factors that should be included in future research on addictive phone use.

In our current digital age, research must move past simply examining time spent online or on phones. The vast majority of young adults, including college students, have access to a smartphone and are online on an almost constant basis (Pew Research Center, 2021a, 2021b); thus, it's important to examine how experiences online may contribute to problematic behaviors and factors that may buffer or exacerbate these relations. One important area for future research will be to examine potential moderators of the links between peer cyber-victimization and problematic phone use to inform targets for intervention. For example, it is possible that adults who adaptively coped with their experience of peer cyber-victimization through social supports or stress reduction strategies may not be as susceptible to developing problematic phone use because they are not reliant on the reinforcing nature of various phone apps (e.g., social media) to relieve negative affect or escape anxiety. A recent study with Chinese adults during COVID-19 quarantines examined coping strategies and cyber-victimization and found that problem-focused coping strategies related to lower levels of cyber-victimization, while emotion-focused strategies were linked to higher levels of victimization and depression (Yang, 2021). These strategies may also have the same effect on problematic phone use. Prevention and reporting strategies created by certain social media or gaming platforms may also help to alleviate internalizing distress as a result of peer cyber-victimization and subsequent problematic phone or media use. The current study controlled for the effects of gender and age; however, future research should examine gender and developmental differences in the links between cyber-victimization, addictive phone use, and mental health problems. Finally, future research should also investigate these pathways with problematic gaming, as adults and college students often report harassment and peer cyber-victimization through these venues (Ballard & Welch, 2017).

Conclusions

The current study sought to examine peer cyber-victimization and addictive phone use among college students. Results of the current study provide support for—and extend—prior theory on problematic media use models by examining peer cyber-victimization as a possible risk factor for addictive phone use. Findings indicate that addictive phone use may emerge among college students who have experienced peer cyber-victimization, through the development of anxiety, but not depressive symptoms. College counseling centers and mental health clinics serving undergraduate students may wish to screen for and gather information on students' online behavior, including peer cyber-victimization, as these experiences may be linked with addictive phone use and internalizing symptoms. Strategies to prevent or cope with peer cyber-victimization experiences may help to lessen addictive phone use. For example, mental health practitioners can work with students to ensure they know how to report incidents of peer cyber-victimization, who they can turn to if they are victimized online (e.g., peers, family members, mental health practitioners, law enforcement), and other adaptive coping strategies such as taking a break from devices.

Conflict of Interest

The authors have no conflicts of interest to declare.

Authors' Contribution

Stephanie Secord Fredrick: conceptualization, data curation, formal analysis, investigation, methodology, writing—original draft, writing—review & editing. **Sarah E. Domoff:** conceptualization, investigation, methodology, and writing—original draft, writing—review & editing. **Katie L. Avery:** writing—original draft, writing—review & editing.

References

Alhassan, A. A., Alqadhib, E. M., Taha, N. W., Alahmari, R. A., Salam, M., & Almutairi, A. F. (2018). The relation between addiction to smartphone usage and depression among adults: A cross sectional study. *BMC Psychiatry, 18*, Article 148. https://doi.org/10.1186/s12888-018-1745-4

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). https://doi.org/10.1176/appi.books.9780890425596

Ballard, E. M., & Welch, K. M. (2017). Virtual warfare: Cyberbullying and cyber-victimization in MMOG play. *Games and Culture, 12*(5), 466–491. https://doi.org/10.1177/1555412015592473

Baloğlu, M., Şahin, R., & Arpaci, I. (2020). A review of recent research in problematic internet use: Gender and cultural differences. *Current Opinion in Psychology, 36,* 124–128. https://doi.org/10.1016/j.copsyc.2020.05.008

Billieux, J., Maurage, P., Lopez-Fernandez, O., Kuss, D. J., & Griffiths, M. D. (2015). Can disordered mobile phone use be considered a behavioral addiction? An update on current evidence and a comprehensive model for future research. *Current Addiction Reports, 2*(2), 156–162. https://doi.org/10.1007/s40429-015-0054-y

Cénat, J. M., Smith, K., Hébert, M., & Derivois, D. (2019). Cybervictimization and suicidality among French undergraduate students: A mediation model. *Journal of Affective Disorders*, *249*, 90–95. https://doi.org/10.1016/j.jad.2019.02.026

Chen, Y., Zhu, J., & Zhang, W. (2021). Reciprocal longitudinal relations between peer victimization and mobile phone addiction: The explanatory mechanism of adolescent depression. *Journal of Adolescence*, *89*(1), 1–9. https://doi.org/10.1016/j.adolescence.2021.03.003

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Routledge.

David, M. E., & Roberts, J. A. (2021). Smartphone use during the COVID-19 pandemic: Social versus physical distancing. *International Journal of Environmental Research and Public Health, 18*(3), Article 1034. https://doi.org/10.3390/ijerph18031034

Domoff, S. E., Foley, R. P., & Ferkel, R. (2020). Addictive phone use and academic performance in adolescents. *Human Behavior and Emerging Technologies, 2*(1)*,* 33–38. https://doi.org/10.1002/hbe2.171

Domoff, S. E., Harrison, K., Gearhardt, A. N., Gentile, D. A., Lumeng, J. C., & Miller, A. L. (2019). Development and validation of the Problematic Media Use Measure: A parent report measure of screen media "addiction" in children. *Psychology of Popular Media Culture, 8*(1), 2–11. https://doi.org/10.1037/ppm0000163

Domoff, S. E., Sutherland, E., Yokum, S., & Gearhardt, A. N. (2021). The association of adolescents' television viewing with body mass index percentile, food addiction, and addictive phone use. *Appetite, 157*, Article 104990. https://doi.org/10.1016/j.appet.2020.104990

Duffy, M. E., Twenge, J. M., & Joiner, T. E. (2019). Trends in mood and anxiety symptoms and suicide-related outcomes among US undergraduates, 2007–2018: Evidence from two national surveys. *Journal of Adolescent Health, 65*(5), 590–598. https://doi.org/10.1016/j.jadohealth.2019.04.033

Elhai, J. D., Dvorak, R. D., Levine, J. C., & Hall, B. J. (2017). Problematic smartphone use: A conceptual overview and systematic review of relations with anxiety and depression psychopathology. *Journal of Affective Disorders, 207*, 251–259. https://doi.org/10.1016/j.jad.2016.08.030

Elhai, J. D., Tiamiyu, M., & Weeks, J. (2018). Depression and social anxiety in relation to problematic smartphone use: The prominent role of rumination. *Internet Research, 28*(2)*,* 315–332. https://doi.org/10.1108/IntR-01-2017-0019

Elsaesser, C., Russell, B., Ohannessian, C. M., & Patton, D. (2017). Parenting in a digital age: A review of parents' role in preventing adolescent cyberbullying. *Aggression and Violent Behavior, 35,* 62–72. https://doi.org/10.1016/j.avb.2017.06.004

Englander, E., Donnerstein, E., Kowalski, R., Lin, C. A., & Parti, K. (2017). Defining cyberbullying. *Pediatrics, 140*(Supplement_2), S148–S151. https://doi.org/10.1542/peds.2016-1758U

Feijóo, S., Foody, M., O'Higgins Norman, J., Pichel, R., & Rial, A. (2021). Cyberbullies, the cyberbullied, and problematic internet use: Some reasonable similarities. *Psicothema, 33*(2)*,* 198–205. https://doi.org/10.7334/psicothema2020.209

Fredrick, S. S., Jenkins, L. N., & Dexter, C. M. (2021). Resiliency in young adulthood and associations among restrospective peer victimization and internalizing problems. *Journal of Child & Adolescent Trauma, 14*(3)*,* 367–379. https://doi.org/10.1007/s40653-021-00342-4

Fredrick, S. S., Nickerson, A. B., & Livingston, J. A. (2022). Adolescent social media use: Pitfalls and promises in relation to cybervictimization, friend support, and depressive symptoms. *Journal of Youth and Adolescence, 51*(2)*,* 361–376. https://doi.org/10.1007/s10964-021-01561-6

Gámez-Guadix, M., Orue, I., Smith, P. K., & Calvete, E. (2013). Longitudinal and reciprocal relations of cyberbullying with depression, substance use, and problematic internet use among adolescents. *Journal of Adolescent Health, 53*(4)*,* 446–452. https://doi.org/ 10.1016/j.jadohealth.2013.03.030

Henry, J. D., & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British Journal of Clinical Psychology, 44*(2), 227–239. https://doi.org/10.1348/014466505X29657

Hinduja, S., & Patchin, J. W. (2015). *Bullying beyond the schoolyard: Preventing and responding to cyberbullying* (2nd ed.). Sage Publications.

Holfeld, B., & Mishna, F. (2019). Internalizing symptoms and externalizing problems: Risk factors for or consequences of cyber victimization? *Journal of Youth and Adolescence, 48*(3), 567–580. https://doi.org/10.1007/s10964-018-0974-7.

Hong, W., Liu, R.-D., Oei, T.-P., Zhen, R., Jiang, S., & Sheng, X. (2019). The mediating and moderating roles of social anxiety and relatedness need satisfaction on the relationship between shyness and problematic mobile phone use among adolescents. *Computers in Human Behavior, 93,* 301–308. https://doi.org/10.1016/j.chb.2018.12.020

Hooper, D., Coughlan, J. P., & Mullen, M. R. (2008). Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods, 6*(1), 53–60. https://doi.org/10.21427/d7cf7r

Hsieh, Y.-P., Shen, A. C.-T., Wei, H.-S., Feng, J.-Y., Huang, S. C.-Y., & Hwa, H.-L. (2016). Multidimensional victimization and internet addiction among Taiwanese children. *Chinese Journal of Psychology, 58,* 217–231. https://doi.org/10.6129/CJP.20160930

Jia, J., Li, D., Li, X., Zhou, Y., Wang, Y., Sun, W., & Zhao, L. (2018). Peer victimization and adolescent internet addiction: The mediating role of psychological security and the moderating role of teacher-student relationships. *Computers in Human Behavior, 85,* 116–124. https://doi.org/10.1016/j.chb.2018.03.042

Jin, L., Hao, Z., Huang, J., Akram, H. R., Saeed, M. F., & Ma, H. (2021). Depression and anxiety symptoms are associated with problematic smartphone use under the COVID-19 epidemic: The mediation models. *Children and Youth Services Review*, *121*, Article 105875. https://doi.org/10.1016/j.childyouth.2020.105875

Kim, B., & Kim, Y. (2017). College students' social media use and communication network heterogeneity: Implications for social capital and subjective well-being. *Computers in Human Behavior, 73*, 620–628. https://doi.org/10.1016/j.chb.2017.03.033

Kokkinos, C. M., Antoniadou, N., & Markos, A. (2014). Cyber-bullying: An investigation of the psychological profile of university student participants. *Journal of Applied Developmental Psychology, 35*(3), 204–214. https://doi.org/10.1016/j.appdev.2014.04.001

Lenhart, A. (2015, April 9). *Teens, social media & technology overview.* Pew Internet and American Life Project. https://www.pewresearch.org/internet/2015/04/09/teens-social-media-technology-2015/

Li, X., Luo, X., Zheng, R., Jin, X., Mei, L., Xie, X., Gu, H., Hou, F., Liu, L., Luo, X., Meng, H., Zhang, J., & Song, R. (2019). The role of depressive symptoms, anxiety symptoms, and school functioning in the association between peer victimization and internet addiction: A moderated mediation model. *Journal of Affective Disorders, 256,* 125–131. https://doi.org/10.1016/j.jad.2019.05.080

Liu, Q.-Q., Yang, X.-J., Hu, Y.-T., & Zhang, C.-Y. (2020). Peer victimization, self-compassion, gender and adolescent mobile phone addiction: Unique and interactive effects. *Children and Youth Services Review, 118,* Article 105397. https://doi.org/10.1016/j.childyouth.2020.105397

Martínez-Ferrer, B., León-Moreno, C., Suárez-Relinque, C., Moral-Arroyo, G. D., & Musitu-Ochoa, G. (2021). Cybervictimization, offline victimization, and cyberbullying: The mediating role of the problematic use of social networking sites in boys and girls. *Psychosocial Intervention, 30*(3), 155-162. https://doi.org/10.5093/pi2021a5

Martínez-Monteagudo, M. C., Delgado, B., Díaz-Herrero, Á., & García-Fernández, J. M. (2020). Relationship between suicidal thinking, anxiety, depression and stress in university students who are victims of cyberbullying. *Psychiatry Research, 286*, Article 112856. https://doi.org/10.1016/j.psychres.2020.112856

Matar Boumosleh, J., & Jaalouk, D. (2017). Depression, anxiety, and smartphone addiction in university students-A cross sectional study. *PLoS One, 12*(8), Article e0182239. https://doi.org/10.1371/journal.pone.0182239

Muthén, L. K., & Muthén, B. O. (2019). *Mplus user's guide*. 8th ed. Los Angeles, CA: Muthén & Muthén; 1998–2019.

National Center for Education Statistics (2021). *Fall enrollment in colleges and universities.* https://nces.ed.gov/programs/digest/d20/tables/dt20_306.10.asp

National Institute of Mental Health (2019). *Mental illness.* https://www.nimh.nih.gov/health/statistics/mental-illness.shtml

Nesi, J., Burke, T. A., Caltabiano, A., Spirito, A., & Wolff, J. C. (2022). Digital media-related precursors to psychiatric hospitalization among youth. *Journal of Affective Disorders, 310,* 235–240. https://doi.org/10.1016/j.jad.2022.05.013

Page, A. C., Hooke, G. R., & Morrison, D. L. (2007). Psychometric properties of the Depression Anxiety Stress Scales (DASS) in depressed clinical samples. *British Journal of Clinical Psychology, 46*(3)*,* 283–297. https://doi.org/10.1348/014466506X158996

Patchin, J. W., & Hinduja, S. (2006). Bullies move beyond the schoolyard: A preliminary look at cyberbullying. *Youth Violence and Juvenile Justice, 4*(2), 148–169. https://doi.org/10.1177/1541204006286288

Perrin, A., & Anderson, M. (2019, April 10). *Share of US adults using social media, including Facebook, is mostly unchanged since 2018*. Pew Research Center. https://policycommons.net/artifacts/616832/share-of-us/1597525/

Pew Research Center. (2021a). *Mobile fact sheet*. https://www.pewinternet.org/fact-sheet/mobile/

Pew Research Center. (2021b). *Social media fact sheet.* https://www.pewinternet.org/fact-sheet/social-media/

Qudah, M. F. A., Albursan, I. S., Bakhiet, S. F. A., Hassan, E. M. A. H., Alfnan, A. A., Aljomaa, S. S., & AL-khadher, M. M. A. (2019). Smartphone addiction and its relationship with cyberbullying among university students. *International Journal of Mental Health and Addiction, 17*(3)*,* 628–643. https://doi.org/10.1007/s11469-018-0013-7

Rideout, V., & Robb, M. B. (2018). *Social media, social life: Teens reveal their experiences*. Common Sense Media.

Rose, C. A., & Tynes, B. M. (2015). Longitudinal associations between cybervictimization and mental health among U.S. adolescents. *Journal of Adolescent Health, 57*(3)*,* 305–312. https://doi.org/10.1016/j.jadohealth.2015.05.002

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1)*,* 68–78. https://doi.org/10.1037110003-066X.55.1.68

Santurio, J. I. M., Fernández-Río, J., Estrada, J. A. C., & González-Vílora, S. (2020). Connections between bullying victimization and satisfaction/frustration of adolescents' basic psychological needs. *Revista de Psicodidáctica, 25*(2)*,* 119–126. https://doi.org/10.1016/j.psicoe.2019.11.002

Selkie, E. M., Kota, R., Chan, Y.-F., & Moreno, M. (2015). Cyberbullying, depression, and problem alcohol use in female college students: A multisite study. *Cyberpsychology, Behavior and Social Networking, 18*(2), 79–86. https://doi.org/10.1089/cyber.2014.0371

Skilbred-Fjeld, S., Reme, S. E., & Mossige, S. (2020). Cyberbullying involvement and mental health problems among late adolescents*. Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 14*(1), Article 5. https://doi.org/10.5817/CP2020-1-5

Slonje, R., Smith, P. K., & Frisén, A. (2013). The nature of cyberbullying, and strategies for prevention. *Computers in Human Behavior, 29*(1), 26-32. https://doi.org/10.1016/j.chb.2012.05.024

Strittmatter, E., Brunner, R., Fischer, G., Parzer, P., Resch, F., & Kaess, M. (2014). Der Zusammenhang von Mobbingerfahrungen, Copingstilen und pathologischem Internetgebrauch bei Jugendlichen [The relationship between bullying experiences, coping style and pathological internet use among adolescents]. *Zeitschrift fur Kinder- und Jugendpsychiatrie und Psychotherapie, 42*(2)*,* 85–94. https://doi.org/10.1024/1422-4917/a000275

Tennant, J. E., Demaray, M. K., Coyle, S., & Malecki, C. K. (2015). The dangers of the web: Cybervictimization, depression, and social support in college students. *Computers in Human Behavior*, *50*, 348–357. https://doi.org/10.1016/j.chb.2015.04.014

Wang, W., Xie, X., Wang, X., Lei, L., Hu, Q., & Jiang, S. (2019). Cyberbullying and depression among Chinese college students: A moderated mediation model of social anxiety and neuroticism. *Journal of Affective Disorders, 256*, 54–61. https://doi.org/10.1016/j.jad.2019.05.061

Watts, L. K., Wagner, J., Velasquez, B., & Behrens, P. I. (2017). Cyberbullying in higher education: A literature review. *Computers in Human Behavior, 69,* 268–274. https://doi.org/10.1016/j.chb.2016.12.038

Wright, M. F. (2016). Cyber victimization on college campuses: Longitudinal associations with suicidal ideation, depression, and anxiety. *Criminal Justice Review*, *41*(2), 190–203. https://doi.org/10.1177%2F0734016816634785

Yang, F. (2021). Coping strategies, cyberbullying behaviors, and depression among Chinese netizens during the COVID-19 pandemic: A web-based nationwide survey. *Journal of Affective Disorders, 281,* 138–144. https://doi.org/10.1016/j.jad.2020.12.023

Zhou, H., Dang, L., Lam, L. W., Zhang, M. X., & Wu, A. M. S. (2021). A cross-lagged panel model for testing the bidirectional relationship between depression and smartphone addiction and the influences of maladaptive metacognition on them in Chinese adolescents. *Addictive Behaviors, 120*, Article 106978*.* https://doi.org/10.1016/j.addbeh.2021.106978

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