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Problematic Social Media Use and Conflict, Social Stress, and Cyber-Victimization Among Early Adolescents

Shongha Kim[1] · **Rachel Garthe**[1] · **Wan-Jung Hsieh**[1] · **Jun Sung Hong**[2]

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Abstract

An alarming number of early adolescents between the ages of 11 and 14 report experiencing cyber-victimization (i.e., bullying that occurs online or via technology). Although research has demonstrated that spending more time on social media can increase the likelihood of cyber-victimization, less research has examined *how* adolescents are using social media. For example, the conflicts and problems that can arise from social media use may also increase vulnerability to cyber-victimization. The current study examined this association between problematic social media use and conflict (PSMUC) and cyber-victimization among a sample of early adolescents. Also, guided by the Social Information Processing model, the current study examined the indirect effect of social stress (i.e., feelings of isolation and social exclusion) in the association between PSMUC and cyber-victimization. Adolescents (N = 316) participated during the spring of sixth grade from a large public middle school in the Midwestern United States. Assessments included measures of PSMUC, cyber-victimization, and social stress. Using structural equation modeling, results indicated that PSMUC was associated with higher levels of cyber-victimization via higher levels of social stress. These findings indicate that social stress is an important mechanism to consider in the relationship between PSMUC and cyber-victimization experiences among early adolescents. Implications for prevention and intervention programs, as well as future research directions, are discussed.

Keywords Cyber-victimization · Social stress · Early Adolescence · Problematic social media use and conflict

Using social media applications and technology has become a dominant component of many adolescents' lives. An estimated 95% of the adolescents (ages 13 to 17) in the United States have access to a smartphone, and 45% of these adolescents were almost constantly online or online several times a day (44%), using a variety of online platforms such as Snapchat, Instagram, and YouTube (Pew Research Center, 2018). Using social media applications can entertain adolescents and foster social connections and belonging (Davis, 2012; Quinn & Oldmeadow, 2013). However, recent researchers have also illustrated that adolescents' use of social media can be associated with a host of negative outcomes, including increased symptoms of depression (Gámez-Guadix et al., 2013), loneliness (Nowland et al., 2018), and suicidal ideation (Sampasa-Kanyinga & Hamilton, 2015), especially when adolescents spend large amounts of time on these applications.

In addition, many of these youth are also experiencing bullying through electronic methods, referred to as *cyber-victimization*. According to the national Youth Risk Behavior Surveillance Survey (Center for Disease Control and Prevention [CDC], 2019a), 15.7% of high school students and 23% of middle school students in the United States reported experiencing cyber-victimization in the past year (Center for Disease Control and Prevention [CDC], 2019b). A scoping review of 159 studies found that as many as 61.1% of adolescents (ranging in age from 10 to 18) experienced cyber-victimization in the past year (Brochado et al., 2017). A recent systematic review of cyber-bullying and victimization found that among the 76 longitudinal studies, the prevalence of cyber-victimization ranged between 1.9 to 84.0% (Camerini et al., 2020). Estimated prevalence rates of cyber-victimization vary significantly across studies, due

✉ Rachel Garthe
rcgarthe@illinois.edu

Shongha Kim
shongha2@illinois.edu

[1] School of Social Work, University of Illinois, 1010 W Nevada Street, Urbana, IL 61801, USA

[2] School of Social Work, Wayne State University, 5447 Woodward Avenue, Detroit, MI 48202, USA

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to differences in the conceptualizations and measurements of cyber-victimization across studies (Brochado et al., 2017; Kowalski et al., 2014). Despite the range in estimates, cyber-victimization is a prevalent concern for many adolescents.

Furthermore, researchers have highlighted that youth who experience cyber-victimization are at heightened risk for depression (Brown et al., 2014; Kowalski & Limber, 2013), anxiety (Brewer & Kerslake, 2015; Kowalski & Limber, 2013; R. van den Eijnden et al., 2014), loneliness (Heiman et al., 2015; Larrañaga et al., 2016), and suicidal ideation (Massing-Schaffer & Nesi, 2020). The prevalence statistics and associated adverse outcomes highlight the upmost urgency of researching risk correlates of cyber-victimization. In addition, given that many early adolescents (between the ages of 11 and 14) are reporting cyber-victimization, more research is necessary during this developmental period. Early adolescents are at a heightened risk for victimization in online spaces as many are gaining autonomy from their caregivers, are interacting with their friends and peers more in person and in online spaces, and going through rapid and numerous physical, cognitive, and social changes (Kokkinos et al., 2016). As early adolescents are navigating these changes to their social environments, they may experience conflicts and problematic situations stemming from their social media use or interactions, or they may experience victimization.

To date, researchers have demonstrated a positive association between how much time is spent on social media and cyber-victimization (Hood & Duffy, 2018; Kırcaburun et al., 2019). However, there is less research on how this time is spent on social media. For example, Van de Eijnden and colleagues (2016) highlighted aspects of *problematic social media use and conflict* (PSMUC); adolescents may get into conflicts or arguments with their family about how much they are using social media or become so preoccupied with social media that they neglect other responsibilities or activities. Adolescents may have arguments with friends or peers because of social media posts, use social media to escape negative thoughts or feelings, have serious problems at school because of spending too much time on social media, or even lose important friendships or relationships because of the amount of time spent on social media (Van de Eijnden and colleagues, 2016). This PSMUC can be detrimental to adolescents' wellbeing. For example, aspects of PSMUC are associated with adolescents' *social stress,* or feelings of loneliness and isolation (Bonetti et al., 2010; Nowland et al., 2018), which could ultimately increase their risk for victimization (Kowalski et al., 2014).

The current study examined a sample of early adolescents by examining the associations between PSMUC and cyber-victimization in sixth grade. Additionally, the current study examined if perceptions of social stress had an indirect effect on the association between PSMUC and cyber-victimization. In other words, this study aimed to understand how PSMUC is associated with an increased vulnerability to cyber-victimization by potentially increasing early adolescents' feelings of social isolation, loneliness, and stress.

Cyber-Victimization

Youth who experience cyber-victimization may encounter harmful interactions and bullying through electronic methods. For example, adolescents may send mean and hurtful messages, post insulting comments, send threatening messages or media, copy and share messages without permission, log into others' accounts, use fake profiles, or post pictures or videos against someone's will. Traditional definitions of bullying include elements of intention, repetition, and a power imbalance, and can encompass multiple forms of victimization, including physical and psychological forms of violence (Olweus, 1994). Some researchers include cyber-victimization as another form of victimization that can happen online or through technology, continuing to utilize the elements of the traditional definition of victimization (Smith et al., 2008). However, other scholars articulate that the three elements of in-person victimization may not apply to experiences with cyber-victimization. For example, cyber-victimization may be anonymously perpetrated, hindering the ability to discern a power imbalance.

As cyber-victimization has become a prevalent concern, there are a few systematic reviews or meta-analysis on the research of cyber-victimization (Camerini et al., 2020; Kowalski et al., 2019). For example, a recent review on cyber-victimization focused on the prevalence, protective factors, and risk factors of cyber-victimization (Kowalski et al., 2019). In this review, researchers have diverse definitions of cyber-victimization, and these differential definitions may impact the wide variation of prevalence rates. Also, the review asserts the importance of taking into account the focus of contexts that cyber-victimization can occur (e.g., between peers, friends, etc.). This review also provided evidence for considering race, ethnicity, and gender when examining rates of cyber-victimization.

Cyber-victimization could also transpire across contexts (e.g., occur at school and continue to occur at the students' home (Kowalski et al., 2014). Additionally, single acts of cyber-victimization may be incredibly hurtful (e.g., posting a harmful comment or message, which can be forwarded or sent to others quickly). Thus, all of the traditional elements of in-person bullying – intention, repetition, and a power imbalance – may not be applicable or translatable to cyber-settings (Thomas et al., 2014). Although there is no unified conceptualization of cyber-victimization across the literature, the current study will examine the frequency of single

acts of cyber-victimization that early adolescents could have experienced across contexts from someone at school.

PSMUC and Cyber-Victimization

Researchers have established a few risk correlates of cyber-victimization among adolescents, including how much time is spent on social media. For example, researchers have examined associations between the overall usage of social media and the increased risk of both perpetrating and experiencing cyber-victimization (Hood & Duffy, 2018; Kırcaburun et al., 2019). Additionally, in a study of 5,329 students (ages 11–20), researchers found that increased use of social network sites was associated with increased risk of cyber-victimization (Sampasa-Kanyinga & Hamilton, 2015). However, in a study with 1,199 German adolescents (age 9–17), the frequency of social media use was not a significant predictor of cyber-victimization (Müller et al., 2018).

These differential findings suggest that researchers may consider exploring other factors related to social media use, other than frequency or overall usage, in relation to experiences with cyber-victimization among adolescents. For example, it may be that the excessive concern with social media and conflict that arises online, rather than just the amount of time spent on social media, that places adolescents at a heightened risk for cyber-victimization. PSMUC includes excessive concern and pre-occupation about using social media, and this excessive concern and use can impair relationships, increase conflict, and impact other aspects of adolescent wellbeing (Andreassen & Pallesen, 2014). When encountering conflicts with peers and family members about their social media use, adolescents may experience heightened levels of stress and may not have an appropriate way of coping (Van Den Eijnden et al., 2016). Thus, the concern and conflict derived from PSMUC should be carefully examined in relation to cyber-victimization, moving the literature beyond examining just the amount of time spent on social media.

The Role of Social Stress

Social Information Processing Model

Scholars have postulated that the Social Information Processing (SIP) model may be informational in explaining the link between peer conflicts and victimization. The SIP model describes cognitive and emotional processes that affect how youth understand their social experiences and how they respond to different social stimuli. As adolescents encounter social situations, they interpret social cues based on their developmental capabilities and past experiences (Crick & Dodge, 1994). This model suggests that if adolescents are experiencing a high amount of conflict with the peers, they may begin to perceive social interactions or cues differently following a conflict, perhaps with more hostility, or with feelings of isolation. For example, if an adolescent is fighting with a peer, they may be more inclined to feel loneliness, exclusion, and other forms of social stress, as a result of this conflict. If this conflict continues, their feelings of social stress may increase, resulting in a higher risk for victimization or negative mental health symptoms (Acquah et al., 2016; Prinstein et al., 2005; van Reemst et al., 2014; Wright, 2017). The process of coding social interactions may be distinct for adolescents who have PSMUC, because there are a minimal number of cues available for adolescents in the cyber-space. Thus, they may be less likely to resolve the conflict or feel even more isolated or excluded as a result of this conflict (Runions et al., 2013). The current study tested this hypothesis, examining how PSMUC is related to perceptions of social stress (e.g., loneliness, social isolation, and exclusion), as well as their cyber-victimization experiences.

Researchers have previously demonstrated that PSMUC is associated with aspects of social stress. For example, PSMUC is associated with feelings of loneliness and social anxiety (Bonetti et al., 2010; Nowland et al., 2018; Peluchette et al., 2015). Adolescents can also experience cyber-ostracism, or a sense of exclusion that can take place in cyber settings (D'Amato et al., 2012). Adolescents who experience problems and conflicts resulting from social media use may be particularly more susceptible to social isolation, loss of friendships, and relationship dissatisfaction (for a review see Andreassen, 2015). Therefore, loneliness, social isolation, and social exclusion are emotions and experiences labeled collectively as *social stress.* Brown and colleagues (2014) examined 106 middle school students and found a positive association between cyber-victimization and social stress. However, to our knowledge, researchers have yet to examine PSMUC, social stress, and cyber-victimization together in one model among a sample of early adolescents.

Present Study

Despite the high prevalence and the detrimental impact cyber-victimization can impose on adolescents, gaps remain in the research. To date, researchers have found that excessive amounts of social media use are associated with a heightened risk for cyber-victimization. Additionally, aspects of social stress, including loneliness and social exclusion, are associated with increased levels of cyber-victimization. However, research is needed to examine how PSMUC and social stress are associated with an increased risk of cyber-victimization among early adolescents.

Utilizing the SIP model, we will specifically test if social stress has an indirect effect on the association between PSMUC and cyber-victimization. We also included gender identity, race, ethnicity, and free and reduced lunch status as covariates in the current study. These covariates were included as previous researchers have found gender differences in levels of social stress (Brown et al., 2014) and cyber-victimization (Brochado et al., 2017; Kowalski & Limber, 2007), as well as differences by race and ethnicity (Hong et al., 2016; Kowalski et al., 2019).

Based on the previous literature and informed by the SIP, the current study aimed to examine the following research aims and hypotheses. First, we examined descriptive differences in rates of PSMUC, social stress, and cyber-victimization by demographic factors. For Hypothesis 1 (H1), we posited that certain groups of students would report higher rates of cyber-victimization and PSMUC, including female-identifying students and White students. We also explored differences by age, ethnicity, and economic status. Second, we examined associations between PSMUC, social stress, and cyber-victimization. We examined two hypotheses when examining these associations. For Hypothesis 2 (H2), it ws hypothesized that greater levels of PSMUC would be associated with increased social stress and increased cyber-victimization among a sample of early adolescents in middle school. For Hypothesis 3 (H3), we hypothesized that PSMUC and cyber-victimization would be significantly associated via higher levels of perceived social stress.

Method

Study Design and Participants

The current study used data from larger study focused on understanding mental health and social-emotional needs, as well as experiences of victimization, of students from a large public middle school. The school is in a semi-urban region in the Midwestern United States. A sample of 316 sixth grade students (ages 11 to 13; M = 11.66 (SD = 0.51)) were enrolled in the study during their spring semester (94% of the sixth-grade class).

Participants included 54.3% female students, who were a diverse racial and ethnic group of students (41.5% African American, 35.1% White, 19.0% Hispanic, 9.2% Asian, and 11.7% identified as "other" or multi-racial). Students were allowed to select as many racial or ethnic categories as they felt applied to them. In terms of family structure, 49.4% of the students lived with their mother and father, 40.2% of the students lived with their mother only, and 12.9% had a grandparent living in their household. Table 1 includes descriptions of sample characteristics.

Table 1 Sample Characteristics (N = 316)

Characteristic	%	N
Gender		
Male	45.7	142
Female	54.3	169
Race		
Black of African American	41.5	131
White	35.1	111
Hispanic or Latino(a)	19.0	60
Asian or Asian American	9.2	29
"Other" or Multi-racial	11.7	37
Ethnicity		
Spanish/ Hispanic/ Latino(a)	21.8	69
Free/Reduced Price Lunch	72.5	229

Procedure

Parents/caregivers of the student participants were informed about the details of this survey via a letter sent home one week prior to the student screening. Passive parental consent was obtained were parents who did *not* want their child participating in the study signed the consent form and sent it back to the school. All students were eligible and invited to participate in the study. The survey was offered in English, Spanish, and French. The research team went into classrooms and conducted the survey; the Principal Investigator or a graduate research assistant introduced the purpose of the study and their rights as research participants. Written student assent was obtained from the students before the administration of the survey. The survey took approximately 30 minutes for students to complete. Students took surveys on electronic tablets to ensure privacy. The university institutional review board (IRB) approved the study protocol.

Measures

Cyber-Victimization

Cyber-victimization was assessed with a modified Cyber-Victimization Scale (CVS; α = 0.87; Bennett et al., 2011). The measure examined experiences of cyber-victimization by asking: "In the past year, have any of these things happened to you? If *yes*, check the following: friend, boyfriend/girlfriend, someone at school, other (e.g., stranger, family)." There was a total of 11 questions asked, modified from the original measure to ensure the language was relevant to middle school students (e.g., "Have any of these people wrote something mean or hurtful about you on social media?", "Have any of these people posted an embarrassing photo or video of you on social media?"). Respondents answered "yes" or "no" to each question with the list of individuals

who may have perpetrated the victimization. The CVS was originally validated among college-aged students; it was revised in the current study by including the answer choices of "someone at school" and "others" to indicate whether the victimization occurred from students at school or from strangers. The measurement was also revised in terms of using adolescent-appropriate and relevant social media applications such as Snapchat and Instagram.

In the current study, we were interested in responses where adolescents experienced cyber-victimization from someone at school. A total cyber-victimization score was calculated by adding yes (*yes* = 1) answers across the 11 items (i.e., sum score) that they experienced cyber-victimization from someone at school.

PSMUC

PSMUC was examined by using five items from the Social Media Disorder Scale (α = 0.85; Van Den Eijnden et al., 2016). These five items examined the problems and conflict derived from adolescents' social media use. The prompt stated, "During the past year, have you…", and the answer choices are either a "yes" or a "no". Sample questions include, "…regularly had arguments with others because of your social media use?", "… had serious conflicts with your parents, brother(s), sister(s), or other family members because of your social media use?" or "Had serious problems at school because you were spending too much time on social media?" The scale demonstrated adequate convergent and criterion validity among adolescents ages 10 to 17 (Van Den Eijnden et al., 2016). For the current study, a latent variable of PSMUC was created with the five items that represented arguments and conflicts with friends and family, problems at school, and loss of friendships as a result of problematic or excessive social media use. All items significantly loaded onto this latent structure of PSMUC (standardized factor loadings ranged from 0.53 to 0.72).

Social Stress

Perceptions of social stress were measured by the Behavioral Assessment System for Children, Self-Rated Adolescent version (BASC-3; α = 0.92; Reynolds & Kamphaus, 2015). According to the BASC-3, social stress is defined as "feelings of stress and tension in personal relationships; a feeling of being excluded from social activities" (p. 74). The social stress scale integrates concepts such as loneliness, isolation, rejection, and hostility from others at school. A T-score calculation, based on gender and age normed reference scores, was used in study analyses. The BASC-3 has been validated in relation to other clinical assessments (e.g., Achenbach Assessment, Behavior Rating Inventory of Executive Function, etc.) and reviewed by experts for content validity in relation to the DSM-5 (American Psychiatric Association, 2013; Reynolds & Kamphaus, 2015).

Data Analysis

Data preparation and cleaning took place in IBM SPSS, Version 26 (IBM Corporation, 2017), and study hypotheses were tested using Mplus Version 8.1 (Muthen & Muthen, 2018). First, data were cleaned, and continuous variables were examined for assumptions of normality (e.g., skewness, kurtosis). Second, study variables were examined for the amount of missingness. All missing data were handled in Mplus using full-information maximum likelihood (FIML) estimations that account for missing data at the item level. The analytic sample size was 316. Third, we coded our covariates, including gender identification (1 = *male*, 0 = *female*), economic status (1 = *free or reduced price lunch*, 0 = *paid lunch*), race (1 = *White*, 0 = *other races*), and ethnicity (1 = *Hispanic or Latinx*, 0 = *not Hispanic or Latinx*).

Using SPSS, descriptive statistics were calculated for all study variables. Bivariate correlations were calculated for continuous variables. To test H1, independent samples t-tests were performed for each of the variables and categorical covariates (e.g., gender, race, ethnicity, and FRPL). Simple regressions with age in association with each of the study variables were also tested using SPSS.

In Mplus, to test H2 and H3, a structural equation model was estimated. Model fit statistics were evaluated, including the chi-square, the comparative fit index (CFI) and the root mean square error of approximation (RMSEA). Values of 0.90 or above for the CFI and 0.05 or below for the RMSEA indicated adequate model fit (Barrett, 2007; Hu & Bentler, 1999; MacCallum et al., 1996). Direct pathways were examined between (1) PSMUC and social stress, (2) PSMUC and cyber-victimization, and (3) social stress and cyber-victimization. All covariates were included in the model. The indirect pathway between PSMUC and cyber-victimization via social stress was also examined. The indirect relationship was analyzed with bias-corrected boot-strapping procedures (Shrout & Bolger, 2002). For the current study, 1000 bootstrap samples using random sampling with replacement were utilized, producing 95% confidence intervals (CIs) and standard errors. If the 95% CIs did not contain zero, then the indirect or mediational effect was considered statistically significant (alpha of 0.05).

Table 2 Correlations between study variables and age (N = 316)

Variable	1	2	3	4
1.PSMUC	–			
2.Social Stress	0.12*	–		
3.Cyber-victimization	−0.02	0.19*	–	
4.Age	0.05	0.004	0.22*	–
M	0.76	59.33	1.00	11.66
SD	1.20	14.63	2.25	0.51

PSMUC Problematic Social Media Use and Conflict, *M* Mean, *SD* Standard Deviation

* $p < .05$

Results

Descriptive Statistics and Bivariate Correlations

Approximately 29% of participants experienced cyber-victimization in the past year from someone at school in the spring of sixth grade. Table 2 presents the correlations between study variables and age along with the descriptive statistics (e.g., means and standard deviations). The results show that perceptions of social stress were significantly associated with experiences of cyber-victimization ($r = 0.19$) and PSMUC ($r = 0.12$). Also, age is significantly associated with cyber-victimization ($r = 0.22$).

For H1, Table 3 shows the results of independent samples t-tests performed with the key study variables (e.g., social stress, PSMUC, and cyber-victimization) with the demographic variables of the study. There were not significant mean level differences between key study variables by gender identity or ethnicity. White students reported higher levels of social stress than non-White students; however, non-White students reported higher levels of PSMUC. Among students with free or reduced price lunch (FRPL), they reported higher levels of cyber-victimization and PSMUC compared to students who did not receive FRPL. Table 4 shows the simple regressions between age and the study variables (H1), and age was significantly associated with cyber-victimization ($\beta = 0.22$, $p < 0.001$), but not with social stress or PSMUC.

Associations Between PSMUC, Social Stress, and Cyber-victimization (H2 and H3)

As shown in Fig. 1, the SEM demonstrated adequate model fit: $\chi^2(33) = 41.50$, $p = 0.15$; CFI = 0.98; RMSEA = 0.03 [90% Confidence Interval: 0.00, 0.05]. As shown in Table 4 and Fig. 1, PSMUC was significantly associated with social stress ($\beta = 0.30$, $p < 0.001$) and cyber-victimization ($\beta = 0.25$, $p < 0.001$). Social stress was also significantly associated with cyber-victimization ($\beta = 0.25$, $p < 0.001$). Additionally, the indirect effect of social stress was tested in the relationship between PSMUC and cyber-victimization. This indirect effect was significant ($B = 0.43$, (95% Confidence Interval = 0.18, 0.90), $p = 0.003$).

Table 3 Comparisons of Means and t-tests of Study Variables and Covariates (N = 316)

Variable	M	t	*df*	*p*
Social Stress				
Gender		−1.62	242	0.11
Female	57.64			
Male	60.67			
Race		−2.35	242	0.02
Non-white	57.42			
White	62.00			
Ethnicity		0.92	242	0.36
Non-Hispanic	59.43			
Hispanic	57.30			
FRPL		−0.47	242	0.64
Non-FRPL	58.31			
FRPL	59.28			
Cyber-victimization				
Gender		1.81	261	0.07
Female	0.67			
Male	0.34			
Race		1.07	261	.29
Non-white	0.58			
White	0.38			
Ethnicity		−1.71	261	0.09
Non-Hispanic	0.43			
Hispanic	0.80			
FRPL		−2.83	241	.005
Non-FRPL	0.10			
FRPL	0.70			
PSMUC				
Gender		0.53	300	0.60
Female	0.80			
Male	0.72			
Race		2.58	300	0.01
Non-white	0.89			
White	0.52			
Ethnicity		–1.23	300	0.22
Non-Hispanic	0.72			
Hispanic	0.92			
FRPL		−2.74	300	0.007
Non-FRPL	0.44			
FRPL	0.88			

Table 4 Simple regression results examining study variables and age; Also, direct pathway coefficients of the structural equation model are presented (N = 316)

Variable	*B*	*SE*	*β*	p-value
Social Stress	0.52	1.87	0.020	0.78
Cyber-victimization	0.69	0.17	0.22	< 0.001
PSMUC	0.12	0.13	0.05	0.36

	Cyber-victimization					Social Stress				
	B	*SE*	*β*	*SE*	R^2	*B*	*SE*	*β*	*SE*	R^2
					0.24					0.13
Gender (Male)	−0.55**	0.17	−0.17**	0.05		3.09	1.80	0.10	0.06	
Race (White)	0.04	0.18	0.01	0.06		5.72**	1.95	0.19**	0.06	
Ethnicity (Hispanic/Latin)	0.11	0.20	0.03	0.05		−2.65	2.24	−0.08	0.06	
Free/ Reduced Lunch	0.19	0.19	0.05	0.05		0.70	2.05	0.02	0.06	
Age	0.73***	0.16	0.23***	0.05		−.68	1.77	−0.02	0.06	
PSMUC	1.45***	0.40	0.25***	0.06		16.10***	4.04	0.30***	0.07	
Social Stress	0.03***	0.01	0.25***	0.06						

PSMUC = Problematic Social Media Use and Conflict, *SE* = Standard Error

*$p < .05$

**$p < .01$

***$p < .001$

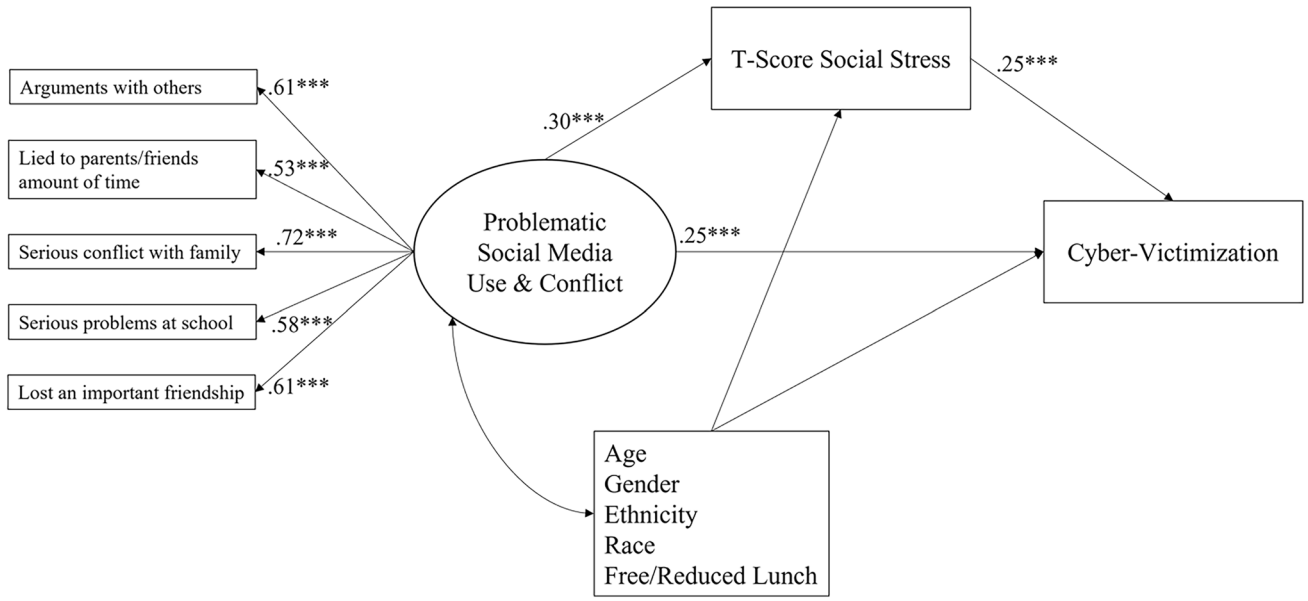

Fig. 1 The indirect effect of social stress on the relationship between PSMUC and cyber-victimization. Standardized factor loadings and regression coefficients are displayed. This model was controlled for gender, race, ethnicity, and free or reduced price lunch ($N = 316$); all associations between covariates and study variables are listed in Table 4. $\chi^2(33) = 41.50$, p = 0.15; CFI = 0.98; RMSEA = 0.03 [90% Confidence Interval: .00, 0.05]. **$p < 0.01$; ***$p < 0.001$

In examination of the covariates, a male gender was negatively associated with cyber-victimization (β = −0.17, p = 0.001). A white race was significantly associated with more social stress (β = 0.19, p = 0.003) and less PSMUC (β = −0.16, p = 0.014). Age was significantly associated with more cyber-victimization (β = 0.23, p < 0.001). Additionally, free or reduced price lunch status was significantly associated with more PSMUC (β = 0.19, p = 0.004).

Discussion

Researchers have demonstrated the high prevalence and negative impact of cyber-victimization across adolescence. However, to date, little research has examined risk correlates that may contribute to cyber-victimization experiences across time among early adolescents. The current study contributed to this area of research by examining the associations between PSMUC and social stress in relation to cyber-victimization. Results demonstrated that social stress was associated with cyber-victimization; additionally, PSMUC and cyber-victimization were indirectly associated via greater perceptions of social stress.

Cyber-victimization and PSMUC among Early Adolescents

Previous surveys have demonstrated that many adolescents are using social media on a regular basis (Pew Research Center, 2018), which can result in an increased risk for cyber-victimization (Hood & Duffy, 2018). Although previous research has shown large variation in the rates of cyber-victimization experienced by adolescents (e.g., Kowalski et al., 2014, 2019), the current study found that 29% of early adolescents experienced cyber-victimization (in the past year) in the spring of sixth grade. The current study examined eleven distinct acts of cyber-victimization, finding that an alarming number of early adolescents experienced cyber-victimization from someone at school via social media, texting, and other technologies.

Additionally, regularly using social media and online platforms can also increase the risk for conflict and negative outcomes related to excessive social media use (Van Den Eijnden et al., 2016). The majority of research examined the general use of social media, or the amount of time spent on social media, in relation to cyber-victimization (Hood & Duffy, 2018). However, this research does not account for the conflict and problems that may arise from excessive concern with using social media; the current study extended this area of research finding that PSMUC was associated with increased experiences of cyber-victimization. Therefore, researchers should consider the types of social interactions, concerns, and conflicts that arise within the use of social media that may lead to increased risks for experiencing cyber-victimization.

The Role of Social Stress

The current study also examined PSMUC in relation to social stress, as well as social stress as a mechanism linking PSMUC and cyber-victimization. Researchers have demonstrated that adolescents who excessively use social media, or experience conflict from this social media use, may be more susceptible to social isolation, loss of friendships, and relationship dissatisfaction (Andreassen, 2015). The findings of the current study revealed that PSMUC was concurrently associated with heightened perceptions of social stress. This association suggests that when early adolescents experience more concern and conflict resulting from their social media use, they may be more susceptible to also feeling more loneliness and social exclusion. Future researchers should consider exploring this relationship across time to determine if PSMUC can lead to changes in social stress longitudinally across middle school.

The current study also found that perceptions of social stress had an indirect effect on the relationship between PSMUC and cyber-victimization. These findings lend support for the SIP framework, suggesting that PSMUC is associated with perceptions of social stress, which was then associated with increased levels of cyber-victimization. In other words, early adolescents who experience excessive concern with using social media and conflict resulting from their social media use, may be at an increased risk for cyber-victimization because they feel more isolation and loneliness. According to the SIP model, these perceptions of social stress may impact how an adolescent approaches or interprets subsequent social interactions, leaving them more vulnerable to experiences of victimization (Runions et al., 2013). Although this study offers preliminary evidence in support of this model in the online context, future research is necessary to replicate these findings with additional samples of early adolescents and across time.

Additionally, there were a few significant associations between study variables and demographic variables. First, age was associated with higher levels of cyber-victimization, which suggests that prevention programs may need to be started earlier than sixth grade. Although previous researchers have found that female adolescents report higher levels of cyber-victimization (e.g., Kowalski & Limber, 2007), the current study did not find those mean level differences. However, male students were less likely to report cyber-victimization in the full SEM model. Given these differential findings, future work is needed to further understand the role of gender in these associations. The current study found that race played a role in mean level differences of PSMUC and social stress, though ethnicity did not. As the links between PSMUC, social stress, and cyber-victimization become more fully understood, researchers may wish to continue examining differences by diverse socio-demographic factors.

Limitations

Although the current study makes important contributions to the literature, it is not without limitations. First, this study included one large middle school in a semi-urban area in the Midwestern United States, which can limit conclusions around generalizability. This school had a diverse student body in terms of race, ethnicity, family structure, and economic status; however, these research findings will need to be replicated across other diverse groups of early adolescents. Second, all assessments were self-reported by the students, and the PSMUC and cyber-victimization questions were answered dichotomously, not allowing for the frequency or severity of a conflict or cyber-victimization experience. Third, the cross-sectional nature of this study limits the directionality of findings; future researchers should consider replicating findings across time to see how PSMUC is associated with changes in social stress and cyber-victimization.

Implications for Practice

Despite these limitations, the current study offers important implications. School social workers, along with other practitioners, such as psychologists and counselors are in a unique position to play an important role in addressing cyber-victimization among adolescents. For example, school social workers should consider how to promote supportive peer environments and healthy cyber behaviors (Kowalski et al., 2014). These school social workers can be an important team member in working with school administrators to develop strategies for addressing cyber-victimization. Although school districts have anti-bullying prevention programs and policies, the assessment of cyber-victimization is imperative and can help determine the prevalence of cyber-victimization among students (Diamanduros et al., 2008). According to Diamanduros and colleagues (2008), assessment of cyber-victimization might include questions related to both direct and indirect experiences in cyber-victimization. Also, an assessment of staff needs regarding cyber-victimization is also important, which can determine school social workers' and teachers' understanding and awareness of students' cyber-victimization, whether cyberbullying is a significant concern for them and their students, and whether the school has an Internet policy related to both cyber-victimization and PSMUC (Diamanduros et al., 2008).

Additionally, although PSMUC may increase students' risk of cyber-victimization, scholars have argued against restricting or banning social media usage for adolescents (Görzig & Frumkin, 2013). Instead, it might be advisable to prevent cyber-victimization by empowering adolescents with providing them with more skills regarding their privacy settings (Patchin & Hinduja, 2010). Additionally, PSMUC includes concerns and conflicts that adolescents may experience with the parents and family members. Although families are being incorporated more into more violence prevention efforts, thinking about families' roles in their adolescents' PSMUC can be an important next step. For example, a vital component of violence prevention programming is to enhance parental supervision and knowledge of social media use. In addition, it is important to mention having conversations about a conflict that can happen online, or promoting positive peer environments at school and online, which may decrease the likelihood of a student experiencing social stress and cyber-victimization.

Finally, stemming from the current study's findings, schools, with the assistance of school social workers, can consider how to promote supportive peer environments and healthy cyber behaviors (Kowalski et al., 2014), which would not only reduce cyber-victimization, but could also potentially reduce social stress resulting from PSMUC. Violence prevention programs have increasingly been including information about cyber-victimization for adolescents (Gaffney et al., 2019). Such programs need to consider the role social stress can also play in the association between PSMUC and cyber-victimization.

Conclusion

The current study provided evidence that PSMUC and social stress were associated with heightened levels of cyber-victimization among a sample of early adolescents. Additionally, PSMUC and cyber-victimization were indirectly associated via greater perceptions of social stress. The current study contributed to the literature by providing in depth understanding of conflict surrounding social media use, and its association with social stress (i.e., social isolation or feelings of social exclusion). This study suggests that future research should focus not only on the frequency and duration of social media usage, but also more on the quality and conflict surrounding social media use. The findings suggest that school social workers should implement cyber-victimization prevention programs earlier in the developmental stages to potentially decrease their experiences with violence. Also, preventive programming should also focus on PSMUC and perceptions of social stress throughout the process.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

References

Acquah, E. O., Topalli, P. Z., Wilson, M. L., Junttila, N., & Niemi, P. M. (2016). Adolescent loneliness and social anxiety as predictors of bullying victimisation. *International Journal of Adolescence and Youth, 21*(3), 320–331. https://doi.org/10.1080/02673843.2015.1083449

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (DSM-5®)*. Retrieved from https://books.google.com/books?hl=ko&lr=&id=-JivBAAAQBAJ&oi=fnd&pg=PT18&dq=dsm+5&ots=ceVQ_3QGwb&sig=vyzfHRHe-zBcChUztq7BTN9UTQk

Andreassen, C. S. (2015). Online social network site addiction: A comprehensive review. *Current Addiction Reports, 2*(2), 175–184. https://doi.org/10.1007/s40429-015-0056-9

Andreassen, C., & Pallesen, S. (2014). Social network site addiction - an overview. *Current Pharmaceutical Design, 20*(25), 4053–4061. https://doi.org/10.2174/13816128113199990616

Barrett, P. (2007). Structural equation modelling: Adjudging model fit. *Personality and Individual Differences, 42*(5), 815–824.

Bennett, D. C., Guran, E. L., Ramos, M. C., & Margolin, G. (2011). College students' electronic victimization in friendships and dating relationships: Anticipated distress and associations with risky behaviors. *Violence and Victims, 26*(4), 410–429. https://doi.org/10.1891/0886-6708.26.4.410

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

Brewer, G., & Kerslake, J. (2015). Cyberbullying, self-esteem, empathy and loneliness. *Computers in Human Behavior, 48*, 255–260. https://doi.org/10.1016/j.chb.2015.01.073

Brochado, S., Soares, S., & Fraga, S. (2017). A Scoping Review on Studies of Cyberbullying Prevalence Among Adolescents. *Trauma, Violence, and Abuse, 18*(5), 523–531. https://doi.org/10.1177/1524838016641668

Brown, C. F., Demaray, M. K., & Secord, S. M. (2014). Cyber victimization in middle school and relations to social emotional outcomes. *Computers in Human Behavior, 35*, 12–21. https://doi.org/10.1016/j.chb.2014.02.014

Camerini, A. L., Marciano, L., Carrara, A., & Schulz, P. J. (2020). Cyberbullying perpetration and victimization among children and adolescents: A systematic review of longitudinal studies. *Telematics and Informatics, 49*, 101362.

Center for Disease Control and Prevention [CDC]. (2019a) *Youth Risk Behavior Surveillance — United States , 2019a*.

Centers for Disease Control and Prevention [CDC]. (2019b) *Middle School YRBS 2019b Results — United States*, 2019b.

Crick, N. R., & Dodge, K. A. (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin, 115*(1), 74–101. https://doi.org/10.1037/0033-2909.115.1.74

D'Amato, G., Cecchi, L., Liccardi, G., Pellegrino, F., D'Amato, M., & Sofia, M. (2012). Social networks: A new source of psychological stress or a way to enhance self-esteem? negative and positive implications in bronchial asthma. *Journal of Investigational Allergology and Clinical Immunology, 22*(6), 402–405.

Davis, K. (2012). Friendship 2.0: Adolescents' experiences of belonging and self-disclosure online. *Journal of Adolescence, 35*(6), 1527–1536. https://doi.org/10.1016/j.adolescence.2012.02.013

Diamanduros, T., Downs, E., & Jenkins, S. J. (2008). The role of school psychologists in the assessment, prevention, and intervention of cyberbullying. *Psychology in the Schools, 45*(8), 693–704. https://doi.org/10.1002/pits.20335

Gaffney, H., Farrington, D. P., Espelage, D. L., & Ttofi, M. M. (2019). Are cyberbullying intervention and prevention programs effective? A systematic and meta-analytical review. *Aggression and Violent Behavior, 45*, 134–153. https://doi.org/10.1016/j.avb.2018.07.002

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

Görzig, A., & Frumkin, L. A. (2013). Cyberbullying experiences on-the-go: When social media can become distressing. *Cyberpsychology*. https://doi.org/10.5817/CP2013-1-4

Heiman, T., Olenik-Shemesh, D., & Eden, S. (2015). Cyberbullying involvement among students with ADHD: Relation to loneliness, self-efficacy and social support. *European Journal of Special Needs Education, 30*(1), 15–29. https://doi.org/10.1080/08856257.2014.943562

Hong, J. S., Lee, J., Espelage, D., Hunter, S., Patton, D. U., & Rivers, T. (2016). Understanding the correlates of face to face and cyberbullying victimization among U.S. adolescents: A social-ecological analysis. *Violence and Victims, 31*, 638–663.

Hood, M., & Duffy, A. L. (2018). Understanding the relationship between cyber-victimisation and cyber-bullying on Social Network Sites: The role of moderating factors. *Personality and Individual Differences, 133*, 103–108. https://doi.org/10.1016/j.paid.2017.04.004

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55.

IBM Corporation. (2017) *IBM SPSS Statistics for Windows*. Armok, NY: IBM Corp

Kırcaburun, K., Kokkinos, C. M., Demetrovics, Z., Király, O., Griffiths, M. D., & Çolak, T. S. (2019). Problematic online behaviors among adolescents and emerging adults: associations between cyberbullying perpetration, problematic social media use and conflict, and psychosocial factors. *International Journal of Mental Health and Addiction, 17*(4), 891–908. https://doi.org/10.1007/s11469-018-9894-8

Kokkinos, C. M., Antoniadou, N., Asdre, A., & Voulgaridou, K. (2016). Parenting and Internet behavior predictors of cyberbullying and cyber-victimization among preadolescents. Deviant Behavior, 37(4), 439–455.

Kowalski, R. M., Giumetti, G. W., Schroeder, A. N., & Lattanner, M. R. (2014). Bullying in the digital age: A critical review and meta-analysis of cyberbullying research among youth. *Psychological Bulletin, 140*(4), 1073–1137. https://doi.org/10.1037/a0035618

Kowalski, R. M., & Limber, S. P. (2007). Electronic bullying among middle school students. *Journal of Adolescent Health, 41*(6 SUPPL.), 22–30. https://doi.org/10.1016/j.jadohealth.2007.08.017

Kowalski, R. M., & Limber, S. P. (2013). Psychological, physical, and academic correlates of cyberbullying and traditional bullying. *Journal of Adolescent Health, 53*(1 SUPPL), S13–S20. https://doi.org/10.1016/j.jadohealth.2012.09.018

Kowalski, R. M., Limber, S. P., & McCord, A. (2019). A developmental approach to cyberbullying: Prevalence and protective factors. *Aggression and Violent Behavior, 45*, 20–32.

Larrañaga, E., Yubero, S., Ovejero, A., & Navarro, R. (2016). Loneliness, parent-child communication and cyberbullying victimization among Spanish youths. *Computers in Human Behavior, 65*, 1–8. https://doi.org/10.1016/j.chb.2016.08.015

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*(2), 130.

Massing-Schaffer, M., & Nesi, J. (2020). Cybervictimization and suicide risk in adolescence: an integrative model of social media and suicide theories. *Adolescent Research Review, 5*(1), 49–65. https://doi.org/10.1007/s40894-019-00116-y

Müller, C. R., Pfetsch, J., Schultze-Krumbholz, A., & Ittel, A. (2018). Does media use lead to cyberbullying or vice versa? Testing longitudinal associations using a latent cross-lagged panel design. *Computers in Human Behavior, 81*, 93–101. https://doi.org/10.1016/j.chb.2017.12.007

Muthen, L. K., & Muthen, B. O. (2018) *Mplus User's Guide*. Los Angeles, CA: Muthen & Muthen

Nowland, R., Necka, E. A., & Cacioppo, J. T. (2018). Loneliness and social internet use: Pathways to reconnection in a digital world? *Perspectives on Psychological Science, 13*(1), 70–87. https://doi.org/10.1177/1745691617713052

Olweus, D. (1994). Bullying at school: basic facts and effects of a school based intervention program. *Journal of Child Psychology and Psychiatry, 35*(7), 1171–1190. https://doi.org/10.1111/j.1469-7610.1994.tb01229.x

Patchin, J. W., & Hinduja, S. (2010). Trends in online social networking: Adolescent use of myspace over time. *New Media and Society, 12*(2), 197–216. https://doi.org/10.1177/1461444809341857

Peluchette, J. V., Karl, K., Wood, C., & Williams, J. (2015). Cyberbullying victimization: Do victims' personality and risky social network behaviors contribute to the problem? *Computers in Human Behavior, 52*, 424–435. https://doi.org/10.1016/j.chb.2015.06.028

Pew Research Center. (2018). A Majority of Teens Have Experienced Some Form of Cyberbullying. In *Pew Research Center*. Retrieved from http://www.pewinternet.org/2018/09/27/a-majority-of-teens-have-experienced-some-form-of-cyberbullying/

Prinstein, M. J., Cheah, C. S. L., & Guyer, A. E. (2005). Peer victimization, cue interpretation, and internalizing symptoms: Preliminary concurrent and longitudinal findings for children and adolescents. *Journal of Clinical Child and Adolescent Psychology, 34*(1), 11–24. https://doi.org/10.1207/s15374424jccp3401_2

Quinn, S., & Oldmeadow, J. A. (2013). Is the igeneration a "we" generation? Social networking use among 9- to 13-year-olds and belonging. *British Journal of Developmental Psychology, 31*(1), 136–142. https://doi.org/10.1111/bjdp.12007

van Reemst, L., Fischer, T. F. C., & Zwirs, B. W. C. (2014). Social information processing mechanaisms and victimization: A literature review. *Trauma, Violence & Abuse, 17*

Reynolds, C., & Kamphaus, R. (2015) *BASC3: Behavior assessment system for children*

Runions, K., Shapka, J. D., Dooley, J., & Modecki, K. (2013). Cyber-aggression and victimization and social information processing: Integrating the medium and the message. *Psychology of Violence, 3*(1), 9–26. https://doi.org/10.1037/a0030511

Sampasa-Kanyinga, H., & Hamilton, H. A. (2015). Social networking sites and mental health problems in adolescents: The mediating role of cyberbullying victimization. *European Psychiatry, 30*(8), 1021–1027. https://doi.org/10.1016/j.eurpsy.2015.09.011

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods, 7*(4), 422–445. https://doi.org/10.1037/1082-989X.7.4.422

Smith, P. K., Mahdavi, J., Carvalho, M., Fisher, S., Russell, S., & Tippett, N. (2008). Cyberbullying: Its nature and impact in secondary school pupils. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 49*(4), 376–385. https://doi.org/10.1111/j.1469-7610.2007.01846.x

Thomas, H. J., Connor, J. P., & Scott, J. G. (2014). Integrating traditional bullying and cyberbullying: Challenges of definition and measurement in adolescents – a Review. *Educational Psychology Review, 27*(1), 135–152. https://doi.org/10.1007/s10648-014-9261-7

Van Den Eijnden, R. J. J. M., Lemmens, J. S., & Valkenburg, P. M. (2016). The social media disorder scale: Validity and psychometric properties. *Computers in Human Behavior, 61*, 478–487. https://doi.org/10.1016/j.chb.2016.03.038

van den Eijnden, R., Vermulst, A., van Rooij, A. J., Scholte, R., & van de Mheen, D. (2014). The bidirectional relationships between online victimization and psychosocial problems in adolescents: A comparison with real-life victimization. *Journal of Youth and Adolescence, 43*(5), 790–802. https://doi.org/10.1007/s10964-013-0003-9

Wright, M. F. (2017). Adolescents' emotional distress and attributions for face-to-face and cyber-victimization: Longitudinal linkages to later aggression. *Journal of Applied Developmental Psychology, 48*, 1–13.