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ONLINE AND OFFLINE BULLYING PERPETRATION IN A RURAL DEVELOPMENTAL CONTEXT: THE IMPACT BY SOCIAL MEDIA USE

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Internet use has become omnipresent in the lives of youth today, forming an essential part of their lifestyle. Practically all youth between the ages of 12 and 17 use the Internet, averaging about 17 hours per week online, with some spending more than 40 hours per week online (Kowalski et al. 2014). While this increased use of the Internet has enhanced and enriched their daily lives, it has also opened the doors for a wide range of potentially negative outcomes, especially regarding online communication (Holfeld & Grabe 2012). With its 24/7 accessibility, lack of face-to-face contact and relative permanence, communicating online has led to a new form of bullying in young people known as cyberbullying (Kowalski, Limber, and Agatston 2012).

While cyberbullying may be considered a newer phenomenon, aggressive behavior in adolescents is familiar to researchers as evident by existing studies of bullying perpetration and victimization (Hunter, Boyle, and Warden 2007; Olweus 1993; Smith, del Barrio, and Tokunaga, 2012). As more young people rely heavily on the use of mobile phones and computers for online communication, a new avenue is produced for youth engagement in aggressive online behaviors through texts, instant messaging, blogs and social media networks, among others (Kowalski & Limber 2007). Previous scholarship has found that 10–33% of youth between 11 and 19 years have been victims of cyberbullying, while more than 15% of youth have been perpetrators of some type of online aggressive behavior (Hinduja & Patchin 2012). Related studies have identified several risk factors associated with cyberbullying perpetration, including high frequency of Internet use and risky online behaviors (Kowalski et al. 2014), aggressive offline behaviors (e.g., Ang, Tan, and Mansor 2011) delinquency (Hinduja and Patchin 2007, 2008), and impulsivity/low self-control (Unnever and Cornell 2003; Vazsonyi et al. 2012).

Previous work has shown that low self-control (LSC) is salient for both cyberbullying perpetration and victimization (Unnever and Cornell 2003; Vazsonyi et al. 2012). This is not surprising given that LSC has also been a strong predictor of traditional bullying (Haynie et al. 2001; Simons-Morton et al. 1999; Vazsonyi et al. 2012) and other forms of deviant or delinquent behaviors among adolescents (e.g., Finkenauer, Engels, and Baumeister 2005; Hay 2001; Pratt and Cullen 2000; Rebellon, Straus, and Medeiros 2008; Vazsonyi, Cleveland, and Wiebe 2006; Vazsonyi and Crosswhite 2004) across variety of cultures and social environments. In addition, low self-control has been associated with excessive social media or Internet use (Wilcox and Stephen 2013) that was in turn one of the risk factors for being victim or perpetrator of cyberbullying (Kowalski et al. 2014).

The current study seeks to address these issues by examining the effects of low self-control on cyberbullying perpetration and offline bullying perpetration as mediated by compulsive use of social media and social media relationship problems. Utilizing a sample of more than 700 adolescents from both a middle and high school in rural Kentucky, path analysis was used to examine the effects for both young men and women.

Cyberbullying (Online Bullying)

Within the cyberbullying research, agreeing on a universal definition of the behavior has been difficult for scholars. While most of the researchers agree that a basic definition involves using methods of electronic communication to harass or bully another individual, there is still debate regarding the conceptualization of cyberbullying (Olweus 2013). Due to the many different forms (e.g., flaming, harassment, exclusion, impersonation) that cyberbullying can take and platforms (text messaging, message boards, e-mail, chat rooms, social networking sites) used as means, definitions vary widely (Willard 2007). This discrepancy can lead to inconsistencies in findings across studies when some researchers define cyberbullying as a style of bullying (cyber versus playground), some define it as an environment (online versus school) and some define it as a communication mode (face to face versus text-message, etc.). This apparent need for a universal definition is necessary to advance sound research within the field (Ybarra et al. 2012).

When analyzing the prevalence of cyberbullying, reaching a conclusion due to the previously mentioned methodological inconsistencies is difficult. While many researchers argue that our ever-expanding technological market and culture are driving up the rates of cyberbullying, Olweus (2013) has presented evidence that

the rates have remained stable over time. Examining a large sample of more than 440,000 students in the United States over four consecutive years from 2007–2010, Olweus (2013) found no indications of increases in the prevalence of cyberbullying over time, regarding both perpetration and victimization. The consensus estimates that the rates for cyberbullying victimization range from 10% to 40%, while the rates for cyberbullying perpetration are slightly lower, ranging between 3% and 25% (Kowalski et al. 2014). Regarding gender differences, studies have reported that male adolescents are significantly more likely to be cyberbullying perpetrators (Hinduja and Patchin 2013; Wang, Iannotti, and Nansel 2009), while females are significantly more likely to be cyberbullying victims (Perren et al. 2010; Vollink et al. 2013; Wang et al. 2009).

Cyberbullying is associated with a wide array of negative behavioral and health consequences. Both cyberbullying perpetrators and victims report negative mental health consequences, such as lower self-esteem, depressive symptoms, and suicidal ideations (Hinduja and Patchin 2010). Cyberbullying victims report higher rates of substance abuse, violent behavior, and risky sexual behavior (Litwiller and Brausch 2013), while cyberbullying perpetrators are more likely to demonstrate difficulties in their behavior, peer-relationships, and emotions (Campbell et al. 2013). In particular, female cyberbullying perpetrators report experiencing higher levels of stress and anxiety than their non-cyberbullying peers.

Offline Bullying

When researching cyberbullying, evaluating research regarding traditional, “playground” or offline bullying is also important. The two types of bullying share common themes with each other, both exhibiting an imbalance in power between the perpetrator and victim and involving aggressive, repetitive acts. However, cyberbullying is notably different from traditional bullying regarding the anonymity and accessibility offered within the realm of cyberspace (Kowalski et al. 2014). Due to a lack of face-to-face involvement, potential perpetrators may be more likely to bully someone online than they would at school. Furthermore, with 24/7 access to the Internet, cyberbullying perpetrators can reach their victims anytime, day or night and on a much larger scale than traditional bullies (Kowalski et al. 2014). Exploring these shared themes, empirical research on cyberbullying has found evidence that characteristics of offline bullying are also associated with cyberbullying perpetration (Olweus 2013; Vazsonyi et al. 2012). In addition, traditional bullies seem to utilize both technology and online platforms as simply

another venue in which to bully their victims. Olweus (2013) aptly summarizes this overlap between types of bullying, stating “to be cyberbullied or to cyberbully others seems largely to be part of a general pattern of bullying, where the use of electronic media is only one possible form” (p. 767). Thus, the current study examined both online as well as offline bullying behaviors, along with their correlates.

Low Self-control

Self-control theory (Gottfredson & Hirschi 1990) has been utilized numerous times since its inception to explain deviant and criminal acts, across cultures (Arneklev, Cochran, and Gainey 1998; Baron 2003; Gibbs and Giever 1995; Özbay 2008; Piquero et al. 2005; Rebellon et al. 2008; Unnever, Cullen, and Pratt 2003; Vazsonyi et al. 2001). Central to the theory is the assumption that engagement in delinquent and deviant behavior depends on a person’s extent of self-control, which is instilled during the first decade of life through parenting practices such as bonding, monitoring and correcting norm violations. Individuals with low levels of self-control are impulsive and insensitive to others, often acting impetuously without thinking of the long-term consequences of their behavior.

Research has demonstrated connections between delinquency and cyberbullying (Hinduja and Patchin 2007, 2008), with cyberbullying perpetrators being more likely to display problematic behaviors and to engage in substance abuse. Gottfredson and Hirschi (1990) have described self-control theory as the most important predictor of deviance, yet few studies have been conducted examining low self-control as an explanation for either cyberbullying or offline bullying behaviors, certainly together. However, low self-control has been found to predict both cyberbullying victimization and perpetration (Vazsonyi et al. 2012). The current study seeks to begin filling this gap in literature and further explore the relationship between low self-control and cyberbullying perpetration.

The Role of Social Media

Social media and networking sites such as Facebook, Twitter and Instagram have gained substantial popularity among adolescents. With the widespread availability of smart phones, more adolescents are spending time on social media. A recent survey conducted by the Pew Research Center (2015) of more than 1,000 youths, aged 13–17 found that 91% of teenagers reported visiting social media sites daily, including 24% who reported going online and visiting social media “almost

constantly.” Girls are more likely to use social media sites than boys, however, a significant number of adolescent boys still visit social media sites (Lenhart 2015).

With higher and higher rates of social media use among adolescents, detrimental behavioral and social effects have begun to emerge. Due to the easy availability of connecting to social media, there has been a rise of individuals developing pathological technology use (PTU), an obsessive compulsion regarding social media or the Internet that resembles addictions to alcohol or drugs (Kowalski et al. 2014). Indicators of this type of compulsive social media use include unsuccessful attempts to limit time on social media, the perception that usage is out of control or attempts to hide amounts of use from others (Caplan 2010). This compulsive use of social media is associated with problematic life consequences such as missing school or work, receiving low grades and missing social events (LaRose 2010). Recent empirical research has also demonstrated a link between compulsive use of social media and involvement in cyberbullying (Meter and Bauman 2015; Reid and Weigle 2014).

Social media use can provide many positive experiences for adolescents, especially regarding socialization, communication and support. Many teens use social media sites to extend and enhance the friendships they already have from their traditional relationships and the diversity of the Internet allows for the creation of relationships between individuals of different social and cultural backgrounds. Furthermore, social media sites can allow adolescents to find support online that they may be lacking in their daily lives, especially regarding marginalized youth, such as LGBT teens or those living with a disability (Chen and Shi 2015). While the usage of social media can encourage positive social interactions, it can also lead to detrimental effects on social relationships. For some individuals, the use of social media can distance them from direct social relationships, resulting in isolation from family and peers, feelings of loneliness and mental health problems (Ortega-Ruiz, Del Rey, and Casas 2012; Sampasa-Kanyinga and Lewis 2015).

As social media use becomes more widespread in society, more studies are being conducted to understand its effects, especially regarding self-control. Wilcox and Stephen (2013) discuss how the use of social media itself, even for short periods, has a negative impact on an individual’s ability to utilize self-control in other tasks. Thus, social media use in effect makes individuals less able to exercise self-control; they become more impulsive. The authors note how this could be particularly disparaging among adolescents as their use of social media is immense. Related to

this, O’Keefe and Clarke-Pearson (2011) discuss how an adolescents’ limited and perhaps still malleable capacity for self-regulation (self-control) places them at greater risk of being cyberbullied or to commit cyberbullying, when using social media for extended periods.

The Present Study

The present study sought to address several, interrelated questions. First, the prevalence of Internet use, bullying, and cyberbullying in the rural developmental context was examined and juxtaposed vis-à-vis national rates. Second, a model was specified which hypothesized direct effects by low self-control on cyberbullying and offline bullying perpetration. Moreover, it was hypothesized that these relationships were mediated through social media problems. In other words, it was expected that adolescents with self-control problems would also show problems in the way they use social media, which in turn would affect both cyberbullying and offline bullying behaviors.

METHODS

The sample consisted of 708 youth between 11-19 years ($M = 14.72$ years; $SD = 1.84$) from a middle school ($N = 212$) and a high school ($N = 496$) in a rural Kentucky county. There was a slight majority of females (53.5%), and the sample was predominantly European American (82.8%), but also included 5% African American and 3.1% Native American youth as well as 8% Latino/Latina adolescents. Regarding ethnic and racial composition, the study sample was slightly more diverse in comparison to county data based on information from the census (85.0 % of European Americans). Additionally, as expected, the rural county was characterized by low population density (69.0 persons per square mile) and relatively low median household incomes (\$40,933 versus \$53,046); we also found that a smaller proportion of its population were college graduates (15.8% versus 22.8%) as compared with national figures. Finally, 17.2% of the county population lived below the poverty threshold (U.S. Census Bureau, 2015). The data in the current study were collected using both paper and pencil and online surveys. The study protocol was reviewed and approved by a University Institutional Review Board.

Measures

Age. Participants’ age was recorded by birth month and year in both samples.

Sex. Adolescents were asked to indicate their sex. Responses were given as male (0) or female (1).

Family structure. Participants rated their family structure by choosing one of seven options. For data analyses, family structure was recoded into a dichotomous variable indicating whether adolescent was from a (1) two-parent family or (0) other type of family.

Socioeconomic status (SES). SES was computed by combining standardized measures of maternal and paternal education as well as the average self-reported family income, an ordered categorical variable answered on 6-point scale ranging from (1) \$20,000 or less, to (5) \$100,000 or more.

Low self-control (LSC). A 12-item, short-form (of 24 items) of the Grasmick et al.'s (1993) Low Self-control Scale was used to assess self-control. LSC is a 5-point Likert-type scale ranging from strongly disagree (1) to strongly agree (5). The LSC scale was internally consistent ($\alpha = .81$).

Social media problems. A new scale was developed for purpose of assessing problems associated with social media use. Items were answered on Likert-type scale ranging from strongly disagree (1) to strongly agree (5). Thirty-eight original items were included and presented to participants. Based on exploratory factor analysis (EFA), 18 items were retained, and two 9-item scales were selected. The first factor (Social Media [SM] Compulsion) taps into the compulsive use of social media, while the second factor (Social Media [SM] Relationship Problems) reflects problems in social interactions due to social media use. Each scale was tested in a confirmatory factor analysis. The results showed good psychometric properties for each scale: SM Compulsion ($\chi^2 = 53.41$, $df = 24$, $p = .0005$, RMSEA = .041, RMSEA 90% CI [.026, .056], CFI = .985), and SM Relationship Problems ($\chi^2 = 51.76$, $df = 23$, $p = .0005$, RMSEA = .041, RMSEA 90% CI [.026, .056], CFI = .975). Both factors also showed excellent reliability, SM Compulsion ($\alpha = .88$) and SM Relationship Problems ($\alpha = .90$). The full list of selected items can be found in Appendix I.

Offline bullying perpetration. Bullying perpetration was measured by Gradinger, Strohmeier and Spiel's (2010) adaptation of Olweus Bully/Victim Questionnaire (Olweus 1996). The items assessed frequency ranging from never (1) to nearly every day (5) of bullying aggression in the last twelve months. The scale had good reliability ($\alpha = .84$).

Cyberbullying (online) perpetration. Cyberbullying perpetration was measured with four items as a part of Gradinger et al.'s (2010) bullying scale. Cyberbullying

perpetration scale included four items assessing frequency ranging from never (1) to nearly every day (5) of cyberbullying aggression in last twelve months. The scale was internally consistent ($\alpha = .89$).

Plan of Analysis

Data analyses were conducted in *Mplus* version 7.31. To provide basic descriptive information of the sample of adolescents, descriptive statistics concerning Internet use, smart phone possession, and social network site profile were computed alongside descriptive statistics and reliability estimates of the main study constructs (low self-control, social media use, cyberbullying perpetration, offline bullying perpetration). Bivariate correlations examined the relationship between the main study constructs in the sample.

Next, a path model was specified based on study hypotheses and tested, where LSC predicted SM Compulsion and SM Relationship Problems (the two mediators) as well as cyberbullying and offline bullying perpetration. In turn, these mediating variables also predicted both on- and offline bullying perpetration measures. Figure 1 shows the model. The significance of indirect effects was tested by a bootstrapping procedure with 5,000 resamples. This model was tested separately for male and female youth given some of the known differences previously described. Model tests controlled for the age of participants, family structure, and SES.

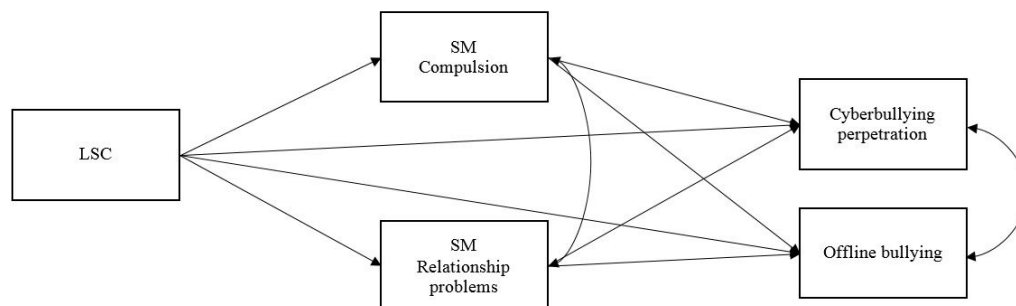


FIGURE 1. THE HYPOTHESIZED MODEL OF INDIRECT EFFECT OF LSC.¹
RESULTS

¹NOTE: LSC = Low self-control. SM = Social media. Control variables (not shown) include age, SES, and family structure.

Table 1 provides information on the prevalence of Internet use in the current adolescent sample. About 86% of adolescents have their own profile on a Social media network site and about 78% of them use smart phones. There was a significant sex difference where female youth were more likely to have a profile than boys, $\chi^2(1, N = 696) = 19.36, p < .001$. Regarding time spent on the Internet, about one third of adolescents spend there an hour or less per day. On the other hand, more than 13.1% of adolescents spent six hours and more on the Internet each day. Table 2 provides frequencies of cyberbullying and offline bullying behaviors. The first question for each behavior assessed an overall prevalence, while the other three questions asked about more specific behaviors. Interestingly, although the three questions are considered subsumed under the first one, for cyberbullying, 14% of students reported engaging in any type of cyberbullying in the past two months while 22% of students specifically reported that they engaged in sending mean text messages. Regarding offline bullying, 38% of students reported that they ever hurt or insulted other student in the past month

TABLE 1. PREVALENCE OF SELECTED ONLINE BEHAVIORS.

	NUMBER	PERCENT
Have a profile on a social networking site		
Yes	609	85.9
No.	91	12.8
Have a smart phone		
Yes	554	78.1
No.	155	21.9
Hours spent on the Internet		
Less than an hour.....	134	18.9
1 hour.....	108	15.5
2 hours.....	135	19.4
3 hours.....	115	16.5
4 hours.....	79	11.4
5 hours.....	31	4.5
6 hours.....	28	3.9
More than 6 hours	65	9.2

Note. The percentage is of valid responses

TABLE 2. PREVALENCE OF CYBERBULLYING AND BULLYING.

	How often have you insulted or hurt other students...	Never	Once / twice	2-3 times a month	Once a week	Nearly every day
Cyberbullying	1. by sending mean text messages, e-mails, videos or photos to them during the last two months?	585 (86%)	65 (9%)	17 (2%)	11 (2%)	7 (1%)
	2. by mean calls during the last two months?	624 (91%)	37 (5%)	16 (2%)	5 (1%)	4 (1%)
	3. by mean text messages during the last two months?	576 (78%)	70 (10%)	70 (10%)	11 (1%)	5 (1%)
	4. by mean videos or photos during the last two months?	635 (92%)	21 (3%)	14 (2%)	11 (2%)	4 (1%)
Offline Bullying	5. during the last two months?	426 (62%)	163 (24%)	43 (6%)	32 (5%)	21 (3%)
	6. by verbally harassing them during the last two months?	493 (72%)	120 (18%)	34 (5%)	22 (3%)	16 (2%)
	7. by physically harassing them during the last two months?	610 (89%)	39 (6%)	18 (3%)	6 (1%)	9 (1%)
	8. by socially excluding them during the last two months?	539 (79%)	105 (15%)	25 (4%)	6 (1%)	9 (1%)

NOTE: The percentage is of valid responses

with verbal harassment the most common type of bullying (28% of all students), followed by social exclusion (21%), and physical harassment (11%).

Data analysis was carried out in three steps. First, bivariate correlations of target study variables were examined. Table 3 provides a correlation matrix of the study variables. The two social media use factors showed a moderate intercorrelation ($r = .44, p < .01$). As expected, low self-control was significantly and positively associated with both measures of social media problems: SM Compulsion ($r = .31, p < .01$) and SM Relationship problems ($r = .27, p < .01$). LSC was also associated with cyberbullying perpetration ($r = .16; p < .01$) and offline bullying ($r = .19, p < .01$). Offline and online bullying perpetration were highly correlated ($r = .68, p < .01$). Offline bullying was also associated with sex ($r = -.11, p < .01$; males more likely), while no significant link with sex was found for online cyberbullying ($r = -.03, p < .51$).

Because LSC was significantly related to both social media use problems as well as to cyberbullying and offline bullying perpetration, the specified model also tested for possible indirect effects by self-control on cyberbullying and bullying perpetration, through social media use problems mediators. The tested model included control variables, LSC as an independent variable, SM Compulsion and SM Relationship problems as the hypothesized mediators, and cyberbullying perpetration and offline bullying as dependent variable. Again, this model was tested separately for male and female youth. Figure 2a shows the full results from model tests on male youth, while Figure 2b shows the same for model tests on female youth.

The results from the path analysis showed that LSC was significantly directly related to SM Compulsion for both male youth ($\beta = .29, p < .01$) and female youth ($\beta = .30, p < .01$) as well as to SM Relationship problems: Male ($\beta = .28, p < .01$) and female ($\beta = .24, p < .01$) adolescents. For male youth, LSC was related to both outcome variables, namely cyberbullying perpetration ($\beta = .17, p < .05$) and offline bullying ($\beta = .24, p < .01$). Unexpectedly, for female youth, however, LSC was not significantly related to either cyberbullying perpetration ($\beta = .07, p < .32$) or offline bullying ($\beta = .12, p < .09$).

For male youth, SM Compulsion was unrelated to either cyberbullying ($\beta = -.02, p < .80$) or offline bullying ($\beta = -.06, p < .49$). For female youth, no significant effect on cyberbullying was found for SM Compulsion ($\beta = .11, p < .08$), but SM Compulsion did predict offline bullying ($\beta = .14, p < .05$). Among male youth, SM

TABLE 3. CORRELATION MATRIX OF THE STUDY VARIABLES.

	1	2	3	4	5	6	7	8	9
1. Low self-control	—								
2. SM compulsion . . . . .	.31**	—							
3. SM relationship problems . . . . .	.27**	.44**	—						
4. Cyberbullying perpetration . . . . .	.16**	.15**	.21**	—					
5. Offline bullying . . . . .	.19**	.12**	.17**	.68**	—				
6. Sex ¹ . . . . .	.09*	.23**	.05	-.03	-.11**	—			
7. Age . . . . .	.04	.15**	.10*	.08*	.08*	.02	—		
8. SES	-.13**	.04	-.09*	-.07	.01	-.06	.04	—	
9. Family structure ² . . . . .	.08*	.07	.05	.02	-.07	.10**	.04	-.28**	—
Cronbach's α . . . . .	.81	.88	.90	.89	.84				

NOTE: * $p < .05$. ** $p < .01$; ¹male = 0, female = 1; ²two-parent family = 0, other family type = 1; SM = Social media;

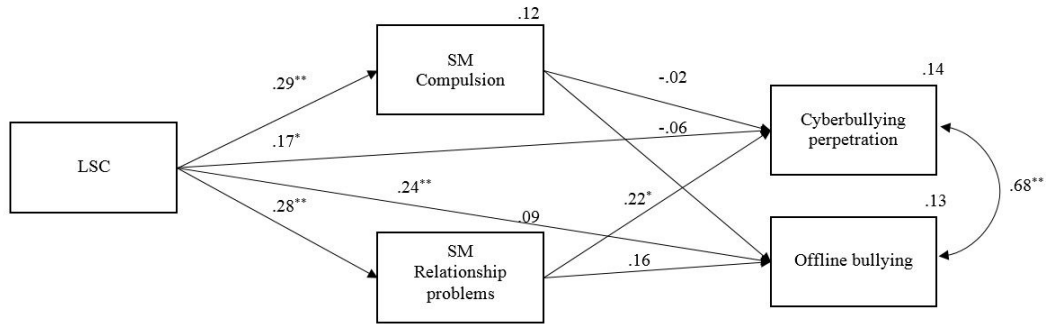


FIGURE 2A. THE FINAL MODEL WITH STANDARDIZED ESTIMATES FOR BOYS.²

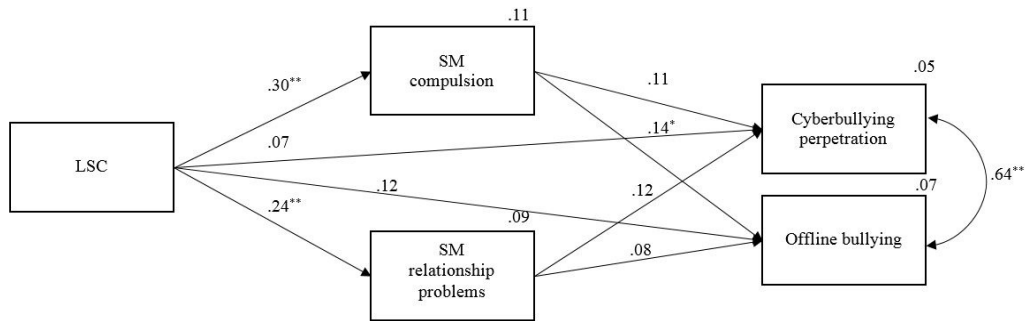


FIGURE 2B. THE FINAL MODEL WITH STANDARDIZED ESTIMATES FOR GIRLS.³

Relationship problems were a significant predictor of cyberbullying ($\beta = .21, p < .05$), but not of offline bullying ($\beta = .16, p < .13$). For female youth, SM Relationship problems unrelated to either cyberbullying ($\beta = .12, p < .13$) or offline bullying ($\beta = .08, p < .28$).

Finally, regarding indirect effects, results from a bootstrapping procedure showed support for an indirect effect of LSC on cyberbullying perpetration through SM relationship problems for male youth only ($B = .06, 95\% \text{ CI } [.011 - .161]$). In addition, no significant indirect effect was found for the link of LSC on cyberbullying through SM Compulsion, neither in male nor female youth. For male adolescents, no indirect effect of LSC was found through either mediator on offline bullying. On the other hand, for female youth, this indirect effect of LSC on offline

²SM = Social media. Correlation between SM Compulsion and SM Relationship Problems ($r = .48, p < .01$) not shown for clarity purposes.

³SM = Social media. Correlation between SM Compulsion and SM Relationship Problems ($r = .34, p < .01$) not shown for clarity purposes.

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bullying through SM compulsion was significant ($b = .05$, CI $[-.001 - .101]$), but not through SM relationship problems. The full model explained 14% of variance in cyberbullying perpetration and 13% of variance in offline bullying in male youth. For girls, it explained less, namely 5% of variance in cyberbullying perpetration and 7% of variance in offline bullying.

DISCUSSION

The current investigation examined online behaviors of adolescents living in a rural setting and specifically tested whether low self-control predicted cyberbullying perpetration as well as offline bullying perpetration, with potential mediating effects by social media use problems. The results support the notion that the Internet and social media are prevalent in the lives of adolescents, including ones living in a rural developmental context. About 70% of adolescents reported spending between less than an hour to up to three hours on the Internet each day, while 13.1% reported spending six hours and more. A total of 78% of adolescents reported having a smart phone, which is line with the Pew Study that found the prevalence to be about 75% (Lenhart 2015), again suggesting rural youth are equally likely to have access to this technology as non-rural youth. About 86% of adolescents reported having a profile on a social network, where female adolescents reported being significantly more likely to have that than male youth, again corroborating findings by the Pew Study. Regarding cyberbullying perpetration, given that there might have been some confusion among participants of what constitutes cyberbullying behavior, the prevalence of cyberbullying perpetration during the past two months in the current sample ranged from 14% to 22%. The prevalence rate for overall bullying was 38%, with verbal harassment being the most common type (28%).

Findings from the path analysis show that the relationships between LSC, social media use problems, cyberbullying perpetration, and offline bullying were mostly consistent with previous research, although some unexpected sex differences emerged. Low self-control significantly predicted both social media use scales, in both male and female youth. This result was expected as previous research found low self-control to predict problematic Internet use overall (Wilcox and Stephen 2013); in addition, youths with lower levels of self-control are more at risk of variety of problem behaviors of compulsive or impulsive character (i.e., substance use; Jones et al. 2015; Schaefer et al. 2015). Thus, the association between LSC and problem social media use, specifically its compulsive part was expected.

LSC was also significantly associated with bullying perpetration online as well as offline in male youth. As LSC was linked to variety of aggressive and impulsive behaviors elsewhere (e.g., Baron 2003; Özbay 2008; Piquero et al. 2005; Rebellon et al. 2008), it is not surprising that male youth with low levels of self-control would be more likely to bully both online and offline. Interestingly, this relationship was not significant in female youth, suggesting that in females bullying and cyberbullying perpetration might be potentially linked to a different set of variables than in boys that were beyond those included in the current study.

Regarding the relationships between the mediators, only SM relationship problems predicted cyberbullying perpetration in boys. None of the social media use scales predicted offline bullying, suggesting that involvement in social media does not necessarily affect regular bullying. On the contrary, male youth who reported increased strain in social relationship related to social media use also reported higher involvement in online bullying. The indirect effect of LSC cyberbullying perpetration via SM relationship problems was significant, suggesting that low levels of self-control among participants lead to problematic use of social media, which may offer a venue for engaging in cyberbullying (Meter and Bauman 2015; Reid and Weigle 2014).

Again, less intuitive results were obtained for girls. SM scales did not predict cyberbullying perpetration; however, unexpectedly, SM compulsion was linked to offline bullying. It is possible that LSC plays a role in this link as we found significant indirect effect of LSC on offline bullying via compulsive use of SM. According to Wilcox and Stephen (2013) the use of social media may have a negative impact on an individual's ability to utilize self-control in other tasks. It is not clear, however, why this relationship holds only for young women and not for young men.

Additionally, a high positive correlation between online and offline bullying perpetration in both male and female adolescents attest to the notion that online bullying offers a yet another venue for offline bullies (Olweus 2013). The significant associations of both types of bullying with both SM compulsion and SM relationship problems show that problems with using social media might be a factor that affects bullying behaviors both online and offline.

The amount of variance explained in both dependent variables was lower for female youth (5% in cyberbullying and 7% in bullying perpetration) than male youth (14% in cyberbullying and 13% in bullying perpetration). Again, this may suggest that other factors than SM use and LSC included in the model are

responsible for rates of offline and online bullying in female youth. Previous research suggests that young women use social media more than young men, and report different patterns of cyberbullying (Hinduja and Patchin 2013; Perren et al. 2010; Vollink et al. 2013; Wang et al. 2009). These gender differences may be related to distinctive associations between LSC, SM use, and offline and online bullying that we found.

Limitations

The limitations of the current study include the cross-sectional nature of the data. Thus, no causality can be inferred. For example, the relationship found between SM relationship problems and cyberbullying perpetration in boys may as well be bidirectional. Conceptually, it is possible that cyberbullying perpetration that may include harassing individuals on social media would lead to strain and problems in social relationships later. Longitudinal data would be needed to disentangle the links between LSC, SM use, and offline and online bullying.

In addition, the sample was limited to two schools from rural Kentucky. Thus, more data from other rural areas would be needed to generalize results on rural areas overall. Additionally to fully understand specifics of the rural sample, comparing the findings with urban samples would be useful.

CONCLUSIONS

With social media and cyberbullying continuing to garner attention in the public's gaze, understanding why some adolescents engage in these behaviors is important. Although social media provide a handy tool for adolescent socializing, this study shows that there might also be space for engaging in cyberbullying. The high inter-correlation with offline bullying suggests an existence of a "spillover effect" where social media provide another opportunity for bullying perpetrators. These perpetrators are often adolescents with lower levels of self-control. It seems that problems with self-control affect how adolescents use social media, and the cyberbullies are the ones who report both compulsive behaviors as well as relationship strains resulting from the way they use social media, thus providing the basis for more serious, long-term adjustment problems.

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APPENDIX I. SOCIAL MEDIA USE SCALE

Participants listed different types of social media they use and then selected a type of social media they use the most. Then, they answered the following questions related to the social media of their choosing:

1. (*My first option*) is part of my everyday activity.✧
2. I am connected to (*my first option*) most of the time, so I can access it whenever it notifies me of some activity.✧
3. Whenever I notice that someone close to me posted something on (*my first option*) I want to comment on it right away.✧
4. I like to start out my day by checking (*my first option*).✧

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5. When studying for an exam/ working on a project, I stay connected to (*my first option*)[♦]
6. I often try to hide the amount of time spent online on (*my first option*).[†]
7. My use of (*my first option*) has made it difficult for me to manage my life.[†]
8. I lied to my friends/family about the amount of time I spend on (*my first option*).[†]
9. I feel like I am missing out if I cannot access (*my first option*) for a longer time.[♦]
10. I sometimes check (*my first option*) during classes.[♦]
11. I would feel very irritated if (*my first option*) went down for a couple of days.[♦]
12. Friends think I may use (*my first option*) too much.[†]
13. Sometimes I got to arguments with people about (*my first option*).[†]
14. (*My first option*) has caused me to lose touch with people who were once close.[†]
15. I frequently check (*my first option*) while I am out with friends.[♦]
16. I feel ashamed by how much time I spend on (*my first option*).[†]
17. I spend more time on (*my first option*) than my friends.[†]
18. I feel (*my first option*) has caused strain in my social relations.[†]

♦Social media compulsion; †Social media relationship problems