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Traditional and cyber bullying and sexual harassment: A longitudinal assessment of risk and protective factors

Ruth W. Leemis, MPH[1], **Dorothy L. Espelage, PhD**[2], **Kathleen C. Basile, PhD**[1], **Laura M. Mercer Kollar, PhD**[1], and **Jordan P. Davis, PhD**[3]

[1]Division of Violence Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, Atlanta, Georgia

[2]Department of Psychology, University of Florida, Gainesville, Florida

[3]University of Southern California, Suzanne Dworak-Peck School of Social Work, Department of Children, Youth, and Families, USC Center for Artificial Intelligence in Society, Los Angeles, California

Abstract

Adolescents engage in bullying and sexual harassment perpetration both in-person and online. Yet, little is known about the overlap of traditional (in-person) and cyber bullying and sexual harassment perpetration. The present study assessed the co-occurrence of these forms of aggression in high school and identified middle school predictors based on participants' perceptions of factors across the social ecology. Racially diverse middle and high school students ($n = 3549$) were surveyed over four time points from Spring 2008 to Spring 2013. A latent class analysis was used to identify classes of individuals according to endorsement of traditional and cyber bullying and sexual harassment items in high school. Four classes were identified: (1) high all, consisting of traditional and cyber bullying and sexual harassment perpetration ($n = 227$); (2) traditional bullying perpetration ($n = 604$); (3) traditional and cyber bullying perpetration ($n = 450$); and (4) low all ($n = 1,261$). Students who reported high levels of anger, self-esteem, empathy, pornographic exposure, and traditional masculinity (individual level), lower levels of social support and parental monitoring (relational level), and higher levels of school belonging (community level) had increased odds of being in the high all class when compared to the other classes. Given the co-occurrence of traditional and cyber bullying and sexual harassment, prevention programming that addresses both forms of aggression across traditional and online contexts may be beneficial. This study also suggests the importance of comprehensive prevention efforts that incorporate approaches at the different ecological levels, such as teaching adolescents healthy emotional and interpersonal skills, and engaging parents in prevention.

Correspondence Ruth W. Leemis, MPH, Division of Violence Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, 4770 Buford Highway, NE, Mailstop F63, Atlanta, GA, 30341. rleemis@cdc.gov.

Keywords

bullying; cyberbullying; protective factors; risk factors; sexual harassment

1 | INTRODUCTION

Bullying and sexual harassment perpetration are distinct public health problems that co-occur among adolescents (Doty, Gower, Rudi, McMorris, & Borowsky, 2017; Espelage, Basile, De La Rue, & Hamburger, 2015; Espelage, Basile, & Hamburger, 2012). With increased access to technology (Anderson & Jiang, 2018), adolescents now have additional opportunities for perpetrating via cell phones and/or computers. Like traditional (i.e., in-person) bullying and sexual harassment, cyberbullying and cyber sexual harassment perpetration also co-occur (Ybarra, Espelage, & Mitchell, 2007). Yet, little is known about the overlap of traditional and cyber bullying and sexual harassment perpetration. The present study assessed the overlap of these forms of aggression in high school and identified middle school predictors.

1.1 | Definitions and prevalence of bullying and sexual harassment perpetration

Bullying is defined as recurring physical, verbal, or relational acts of aggression perpetrated by one or more youth, and can take place in-person or online (Gladden, Vivolo-Kantor, Hamburger, & Lumpkin, 2014). Bullying estimates vary but, in general, reveal that 19.3% to 36.5% of middle and high school students report traditional bullying perpetration, and 10.9% to 15.8% of students perpetrate cyberbullying (Kowalski, Morgan & Limber, 2012; Kowalski & Limber, 2013; Schneider, O'Donnell, Stueve, & Coulter, 2012). Sexual harassment in the school setting is unwanted sexual behavior, including written or verbal comments, transmission of sexual images, and physical touch or coercion (Hill & Kearl, 2011). Like bullying, sexual harassment can take place in-person or via the Internet or text messages (Hill & Kearl, 2011). Estimates suggest that 15% of students in grades 7–12 report traditional sexual harassment perpetration and 10% report cyber sexual harassment perpetration (Hill & Kearl, 2011). A recent study of 10–21 year olds found that 23% of male and 17% of female youth reported traditional sexual harassment perpetration (Ybarra & Thompson, 2017).

1.2 | Traditional and cyber bullying and sexual harassment perpetration co-occurrence

The majority of adolescents report access to and use of phones and computers to communicate regularly with peers via messaging applications and social networking sites; 95% of teens report having a smartphone or access to one, and 45% report being online "almost constantly" (Anderson & Jiang, 2018). Moreover, the Internet and social media allow for anonymity and instant dialogue (Chaffin, 2008). Because of widespread technology use, studies have sought to understand the overlap between traditional and cyber forms of bullying and sexual harassment. In general, traditional and cyber bullying perpetration co-occur (Kowalski et al., 2012; Williams & Guerra, 2007), and cyberbullying increases from middle to high school while traditional bullying declines (Hinduja & Patchin, 2008; Vandebosch & Van Cleemput, 2009). With respect to traditional and cyber sexual

harassment, studies have compared perpetration estimates (Hill & Kearl, 2011) and combined perpetration estimates (Ybarra & Thompson, 2017), but no studies were found that assessed the co-occurrence of perpetration among the same adolescents. Some studies have focused on victimization, rather than perpetration, and provide evidence that traditional and cyber sexual harassment victimization co-occur. For example, Ybarra, Mitchell, and Espelage (2012) found that 18% of youth aged 10–15 years reported unwanted sexual experiences in school, and 18% reported unwanted sexual experiences online; 42% of those youth experienced unwanted sexual experiences in both places. Thus, traditional and cyber sexual harassment perpetration presumably co-occur as well.

While no studies to the authors' knowledge have assessed the cooccurrence of all forms of traditional and cyber bullying and sexual harassment, Doty et al. (2017) assessed person-centered patterns of cyberbullying victimization and traditional bullying and sexual harassment perpetration and victimization among 8th, 9th, and 11th grade students in Minnesota at one time-point. The authors identified five latent classes of students – high-risk for all forms of victimization and perpetration (7%), relational and cyberbullying victimization (17%), sexual harassment victimization and perpetration (8%), physical bullying perpetration (6%), and low-risk (62%) – and found that lower levels of social connections with teachers and peers increased risk for all classes when compared to the low-risk class. These findings reinforce the need to assess bullying and sexual harassment together and suggest that cyberbullying may not be its own distinct form of violence because it co-occurs with these traditional forms of aggression.

1.3 | Risk and protective factors for bullying and sexual harassment perpetration

To date, research has identified risk and protective factors for traditional bullying and sexual harassment at different levels of the social ecology (i.e., individual, relationship, school/community, societal levels; Basile, Espelage, Rivers, McMahon, & Simon, 2009; Dahlberg & Krug, 2002). While there is variability across the literature due to differences in measurement and sampling designs, many shared risk and protective factors have been identified across the two forms of violence. For example, individual level risk factors for both bullying and sexual harassment perpetration include substance use, high impulsivity, low empathy, low self-esteem, anger, and traditional beliefs about masculinity (Endresen & Olweus, 2001; Farrington & Baldry, 2010; Low & Espelage, 2013; O'Moore & Kirkham, 2001; Tharp et al., 2013). Relational risk factors include family conflict and hostility, low parental monitoring, low social support, and delinquent peer associations (Basile, Hamburger, Swahn, & Choi, 2013; Foshee et al., 2016; Hong & Espelage, 2012; Nansel, Overpeck, Haynie, Ruan, & Scheidt, 2003; Tharp et al., 2013). Exposure to neighborhood violence and a lower sense of belonging in school are shared community level factors (Basile et al., 2013; DeGue et al., 2013; Hong & Espelage, 2012).

Given the abundance of research on these topics, there appear to be many shared risk and protective factors between bullying and sexual harassment. However, they also have some unique risk factors. For example, exposure to pornography, dismissiveness of sexual harassment, and early sexual initiation have been identified as risk factors for sexual harassment (Tharp et al., 2013). The unique relationships between these factors and sexual

harassment are presumably driven by their sexual nature. However, given the variability across the literature, it is likely that other unique differences exist across specific subpopulations.

Overall, the literature has predominantly focused on assessing predictors for traditional forms of bullying and sexual harassment, but recent studies have begun studying predictors of cyberbullying, and suggest that traditional bullying and cyberbullying share common predictors (Low & Espelage, 2013; Williams & Guerra, 2007), including negative school climate, moral approval of bullying, and low peer support. Information on shared predictors of traditional and cyber sexual harassment is lacking. Moreover, while these studies are helpful in understanding what might increase or protect against bullying and sexual harassment perpetration, most rely on cross-sectional data that does not provide insight into whether they are predictive over time.

1.4 | Current study

The current study seeks to build on Doty et al. (2017) work in that we: (1) assess latent classes of traditional and cyber bullying and sexual harassment perpetration (both forms of traditional and cyber perpetration) in high school and (2) examine risk and protective factors for bullying and sexual harassment in middle school based on participants' perceptions of factors across different social ecological levels (Basile et al., 2009; Dahlberg & Krug, 2002). Similar to Doty et al. (2017), we expect that at least three classes of perpetration among high school adolescents will emerge (Hypothesis 1). Additionally, because bullying and sexual harassment have both shared and unique predictors, we expect that students reporting higher levels of both bullying and sexual harassment perpetration would have more associated risk factors and less associated protective factors in middle school than other students (Hypothesis 2).

2 | MATERIALS AND METHODS

2.1 | Participants and procedures

Students from four middle schools and six high schools in the Midwest ($n = 3549$) were surveyed at four times from Spring 2008 to Spring 2013. A waiver of active parental consent was approved by the Institutional Review Board, so parents only returned signed consent forms if they did not wish for their child to participate. During survey administrations, trained proctors described the study, collected student assent, and read the survey aloud while students completed it. The surveys took approximately 30 min to complete, and all students were given victim resources afterwards. The sample was 50.2% female and racially diverse: 46.2% Black, 32.2% white, 5.4% Hispanic, 2.3% Asian/Pacific Islander, and 7.9% other. Students were in the 5th (4.0%), 6th (34.1%), 7th (34.2%), or 8th grade (27.7%) at baseline, and were sophomores, juniors, or seniors in high school. Table 1 has more information on demographics and perpetration endorsement.

2.2 | Measures

2.2.1 | Outcome measures—Because the distribution for perpetration was skewed, all perpetration items were dichotomized to indicate if a student ever engaged (1) or never engaged (0) in that specific perpetration item during high school (Waves 3 and 4).

<u>Traditional bullying perpetration:</u> The nine-item Illinois Bully Scale (Espelage & Holt, 2001) assessed the frequency of bullying at school. Students were asked to recall how frequently they teased others, upset others for the fun of it, excluded others from their group of friends, helped harass others, and threatened to hit or hurt another student. Prior to dichotomization, response options ranged from "*Never*" to "*7 or more times*" in the past 30 days on a five-point Likert scale (0–4). Exploratory and confirmatory factor analysis has demonstrated the construct validity of this scale (Espelage & Holt, 2001), and Cronbach's alpha (α) was .86.

<u>Traditional sexual harassment perpetration:</u> An abbreviated version of the American Association of University Women (AAUW) Sexual Harassment Survey was used to assess sexual harassment perpetration (Hill & Kearl, 2011; Rinehart, Espelage, & Bub, 2017). Students were asked "*During this school year, did you do any of the following to other students at school?*" Participants were presented with six items on unwanted verbal sexual harassment (i.e., sexual comments, sexual rumor spreading, and showing sexual pictures), and forced sexual contact (i.e., touching in a sexual way, physically intimidating in a sexual way, and forcing to do something sexual). Response options were "*Never*," "*1 or 2 times*," "*3 or 4 times*," "*5 or 6 times*," and "*7 or more times*," and α was .76.

<u>Cyberbullying perpetration:</u> Cyberbullying perpetration was assessed with a four-item scale based on Ybarra et al. (2007). Students were asked how often they did these things in this school year: made rude or mean comments to anyone online; spread rumors about someone online, whether they were true or not; made aggressive or threatening comments to anyone online; and sent a text message that said rude or mean things. Response options included "*Not sure*," "*Never*," "*Rarely*," "*Occasionally*," and "*Often*"; α = .79.

<u>Cyber sexual harassment perpetration:</u> Cyber sexual harassment perpetration was assessed with a three-item scale based on the work of Ybarra et al. (2007). Students were asked how often they did the following things in the last school year: tried to get someone else to talk about sex online when they did not want to; asked someone to do something sexual online when the other person did not want to; sent a picture text message that was sexual in any way when that person did not want to receive it. Response options included "*Not sure*," "*Never*," "*Rarely*," "*Occasionally*," and "*Often*"; α was .76.

2.2.2 | Risk and protective factors—Predictors were measured in late middle school (Wave 2) and included participants' perceptions of individual, relational, and community/school level factors. Full descriptions of measures are available in Supplemental Table S1.

Perceptions of individual level factors that were assessed: impulsivity, 4 items, α = .84 (Bosworth, Espelage, & Simon, 1999); alcohol use, 5 items, α = .86 (Farrell, Kung, White, & Valois, 2000); drug use, 4 items, α = .74 (Farrell et al., 2000); depression, 6 items, α = .

87 (Orpinas, 1993); empathy, 5 items, α = .82 (Bosworth & Espelage, 1995); self-esteem, 4 items, α = .87 (Feldman & Weinberger, 1994); anger, 4 items, α = .74 (Espelage & Stein, 2006); pornography exposure, 2 items, α= .77 (Espelage & Stein, 2006); traditional masculinity, 7 items, α= .70 (Chu, Porche, & Tolman, 2005); dismissiveness of sexual harassment, 11 items, α = .81 (Taylor & Stein, 2007).

Perceptions of relational level factors that were assessed: peer delinquency, 7 items, α = .90 (Institute of Behavioral Science, 1987); family conflict and hostility, 3 items, α = .86 (Thornberry, Krohn, Lizotte, Smith, & Tobin,2003); family violence, 3 items, α = .84 (Hamburger, Leeb, & Swahn, 2008); parental monitoring, 4 items, α = .91 (Arthur, Hawkins, Pollard, Catalano, & Baglioni, 2002); and social support, 9 items, α = .89 (Vaux, 1988).

Perceptions of community/school level factors included: positive neighborhood, 3 items, α = .89 (Espelage & Stein, 2006); exposure to community violence, 5 items, α = .92 (Low & Espelage, 2014); and school sense of belonging, 4 items, α = .77 (Goodenow, 1993).

2.2.3 | Baseline co-variates—Baseline (Wave 1) self-reports of sex, race, maternal education, age, bullying victimization and perpetration (traditional, Espelage & Holt, 2001; cyber, Ybarra et al., 2007) and sexual harassment victimization and perpetration (traditional, Rinehart et al., 2017; cyber, Ybarra et al., 2007) were assessed as covariates.

2.3 | Analyses

We utilized latent class analysis (LCA) in *Mplus* version 8 (Muthén & Muthén, 1998–2017) to address our first hypothesis. Specifically, we used dichotomized traditional and cyber bullying and sexual harassment perpetration items in our LCA. LCA is a technique that identifies heterogeneity within a sample and groups individuals based on probability of item endorsement. We fit models ranging from one to five classes and examined fit statistics to determine if adding an additional class improved model fit. To assess model fit, we used reductions in the negative two log likelihood (−2LL), Akaike Information Criteria (AIC), Bayesian Information Criteria (BIC), and the sample size adjusted Bayesian Information Criteria (aBIC); these are all log likelihood measures for which lower values indicate better fit (Nylund, Asparouhov, & Muthén, 2007). Further, we used the Vuong-Lo-Mendell-Rubin (VLMR) likelihood ratio test, Lo-Mendell-Rubin (LMRT) adjusted likelihood ratio test, and the bootstrapped likelihood ratio test (BLRT) parameters to test the superiority of a model with k classes against a model with $k-1$ classes (Lo, Mendell, & Rubin, 2001), with significant p values indicating better model fit.

To address our second hypothesis, we assessed late middle school predictors of class membership across different levels of the social ecology based on participants' perceptions. That is, after determining the optimal number of classes, each participant was assigned to a class based on posterior class membership probability. This membership status was then used as an outcome variable in a series of multinomial logistic regression models. Diagnostics on our middle school predictors indicate that there was no evidence of multi-collinearity as variables were not correlated with each other at $r > .70$ (Supplemental Table S2), VIF scores were below 10 (with the majority of variables below 5), and Tolerance

scores were above .1. Thus, we estimated four models corresponding to participants' self-reported experiences across the social ecology: Model 1 entered perceptions of individual level factors, Model 2 entered perceptions of relational level factors, and Model 3 entered perceptions of school/community level factors. As a final model, we entered every predictor across the three social ecologies into one model (Model 4). Because we were primarily interested in youth who engage in high levels of traditional and cyber bullying and sexual harassment, the *high all* class was the reference group. Thus, all adjusted odds ratios (AORs) were inversed. AORs above one indicate higher odds of being in the high all class in high school and AORs below one indicate lower odds of being in the high all class in high school.

All models controlled for sex (female reference), race (nonwhite reference), maternal education (high school or less reference), age (centered on grand mean), and the following *early middle school* baseline co-variates (Wave 1): traditional and cyber bullying victimization and perpetration and traditional and cyber sexual harassment victimization and perpetration. Missing data ranged from 4% to 25% across the two high school waves and was adjusted for using a maximum likelihood estimator under the assumption that data are missing at random.

3 | RESULTS

3.1 | Latent class results

Model fit indices for the LCA are presented in Table 2 and were used to test our first hypothesis, which was supported. Based on model fit indices and analysis of the plotted probability profiles, the four-class model fits the data best. Figure 1 presents the item probability plot. The four resulting classes were labeled as follows: "*high all*," "*traditional bullying perpetration*," "*traditional/cyber bullying perpetration*," and "*low all*." The *high all* class represented 9% ($n = 227$) of the sample. Item endorsement across all constructs was highest in this class. While endorsement of both traditional and cyber sexual harassment perpetration was low, in general, endorsement ranged from .08 to .50. Endorsement of traditional (range .56–.89) and cyber (range .56–.96) bullying perpetration were highest in the *high all* class. The *traditional bullying perpetration* class represented 24% ($n = 604$) of the sample. Endorsement of both traditional and cyber sexual harassment perpetration were near zero (range .00–.23). However, endorsement of traditional bullying nearly mirrored that of the *high all* class (range .56–.70). The *traditional/cyber bullying perpetration* class represented 18% ($n = 450$) of the sample. This class also had near zero endorsement (range .00–.11) of both traditional and cyber sexual harassment. Endorsement of traditional and bullying perpetration varied (range .03–.76) with few individuals reporting engaging in "helping harass students" and "spreading rumors" but relatively high endorsement of some traditional forms of bullying such as "threatened to hurt or hit someone" and cyberbullying such as "made rude or mean comments online" and "sent a rude or mean text". Finally, the *low all* class represented 50% ($n = 1,261$) of the sample. Endorsement of all items across all constructs were low (range .00–.23).

3.2 | Predictors of class membership across the social ecology

3.2.1 | Perceptions of individual level factors

Table 3 Model 1 presents inversed AORs for the individual domain. Results indicated that risk factors, namely, alcohol use, drug use, and dismissiveness of sexual harassment, and protective factors empathy and self-esteem, did not differ across classes. However, a one unit higher score on impulsivity was associated with a 1.11 (1.02, 1.19) and 1.19 (1.07, 1.32) higher odds of being in the *high all* class than youth in the *traditional bullying perpetration* and *low all* classes, respectively. Further, the odds of being in the *high all* class were higher for those with higher scores on anger (*AOR* range 1.23–1.64), pornographic exposure (*AOR* range 1.83–3.19), and traditional masculinity (*AOR* range 1.13–1.23) compared to all classes. Reports of more depressive symptomology was associated with 0.93 (0.89, 0.98) and 0.91 (0.86, 0.96) lower odds of being in the *high all* class than the *traditional bullying perpetration* and *low all* classes, respectively.

3.2.2 | Perceptions of relational level factors

Across the relational domain, no significant differences existed between the *high all* and *traditional/cyber bullying perpetration* classes (inversed AORs in Table 3 Model 2). Further, both family conflict and hostility and parental monitoring were non-significant predictors of class membership. However, we did find that a higher peer delinquency score was associated with 1.05 (1.01, 1.09) and 1.14 (1.07, 1.22) higher odds of being in the *high all* class than the *traditional bullying perpetration* and *low all* classes, respectively. Similar results were found for family violence with 1.09 (1.01, 1.18) and 1.14 (1.03, 1.26) higher odds of being in the *high all* class than the *traditional bullying perpetration* and *low all* classes, respectively. The only protective factor that varied across classes was social support. Specifically, higher scores on social support in late middle school were associated with 0.92 (0.85, 0.99) and 0.90 (0.82, 0.98) lower odds of being in the *high all* class than the *traditional bullying perpetration* and *low all* classes, respectively.

3.2.3 | Perceptions of community and school level factors

As shown with the inversed AORs in Table 3 Model 3, we found that higher levels of positive neighborhood was associated with 0.69 (0.48, 0.97) and 0.57 (0.39, 0.84) lower odds of being in the *high all* class than the *traditional bullying perpetration* and the *traditional/cyber bullying* classes, respectively. Similar results were found for exposure to violence. Specifically, a one-unit increase on the exposure to community violence scale was associated with 1.11 (1.04, 1.18), 1.07 (1.01, 1.13), and 1.14 (1.07, 1.21) higher odds of being in the *high all* class than the *traditional bullying perpetration, traditional/cyber bullying perpetration*, and *low all* classes, respectively.

3.2.4 | Full model

In the full model, we combined all predictors from all dimensions (Table 4 Model 4). For the individual predictors, the odds of being in the *high all* class were higher for those scoring higher on anger (*AOR* range 1.20–1.56) and pornographic exposure (*AOR* range 1.59–2.74) across all classes. Higher traditional masculinity scores were associated with 1.12 (1.01, 1.24) and 1.19 (1.07, 1.34) higher odds of being in the *high all* class than the *traditional bullying* and *low all* classes, respectively. Higher self-esteem was associated with 1.12 (1.02, 1.23) and 1.16 (1.05, 1.27) higher odds of being in the *high all*

class than the *traditional/cyber bullying perpetration* and *low all* classes, respectively. Empathy was somewhat similar in that higher scores were associated with 1.22 (1.08, 1.37) higher odds of being in the *high all* class than the *low all* class.

Among the relational level predictors, we found higher social support to be associated with 0.84 (0.76, 0.93), 0.84 (0.76, 0.96), and 0.75 (0.67, 0.85) lower odds of being in the *high all* class than the *traditional bullying, traditional/cyber bullying*, and *low all* classes, respectively. Similar results were found for parental monitoring, with 0.93 (0.87, 0.99) and 0.94 (0.88, 0.99) lower odds of being in the *high all* class than the *traditional/cyber bullying* and *low all* classes, respectively. In the community/school level, only school belonging remained a significant predictor. Higher school belonging was associated with higher odds (*AOR* range 1.22–1.27) of being in the *high all* class compared to all classes.

4 | DISCUSSION

To our knowledge, this is the first examination of the overlap of traditional *and* cyber bullying and sexual harassment perpetration in high school and their middle school predictors. In this sample of high school adolescents, four classes emerged which was consistent with our first hypothesis. Half of the students endorsed low levels of both traditional and cyber aggression, whereas the other half endorsed various combinations of perpetration. Among the three classes that endorsed perpetration, most students reported engaging in traditional bullying perpetration or a combination of traditional and cyber bullying perpetration. Traditional and cyber sexual harassment perpetration endorsement was relatively low but co-occurred with traditional and cyber bullying perpetration among one-tenth of students.

While Doty et al. (2017) assessed victimization along with perpetration and did not include cyber sexual harassment, our findings are similar in that we found a high-risk group, separate bullying groups with some overlap between traditional and cyber bullying, and a low-risk group. However, the low-risk group in this study included a smaller percentage of students (50% vs. 62%). Together, both studies reinforce the co-occurrence of bullying and sexual harassment and suggest that cyber bullying and cyber sexual harassment may be variations of the same in-person behaviors. Our study suggests that traditional *and* cyber sexual harassment co-occur, and they co-occur with traditional *and* cyber bullying. The co-occurrence of traditional and cyber bullying is consistent with previous work (Espelage et al., 2015).

Our second hypothesis was partially supported in that endorsement of high levels of identified risk factors and low levels of protective factors in middle school were generally associated with a higher odds of being in the *high all* group when compared to other groups. However, not all identified risk and protective factors were significant predictors in our study and there were some differences across regression models. In the final model, when compared to the *low all* and *bullying perpetration groups*, there was a higher odds of being in the *high all* group in high school among students who reported higher anger, self-esteem, pornographic exposure, and traditional masculinity (participants' perceptions of individual level factors), lower social support and parental monitoring (perceptions of relational level

factors), and higher school belonging (perceptions of community level factors) in middle school. Those in the *high all* group also reported higher empathy (perceptions of individual level) than those in the *low all group*.

Given the distinguishing factor between the *high all* group and the bullying perpetration groups is that the *high all* group includes traditional and cyber sexual harassment, it is not surprising that exposure to pornography was a significant predictor as it has been associated with sexual harassment (Tharp et al., 2013). Traditional masculinity and social support's association with both bullying and sexual harassment has been well documented so the strength of their association is also not surprising (Basile et al., 2013; Farrington & Baldry, 2010; Nansel et al., 2003; Tharp et al., 2013). Interestingly, the associations for empathy, self-esteem, and school belonging were not significant in the domain-specific modeling, but became significant in the unexpected direction in the final model. Diagnostics on our middle school predictors indicate that there was no evidence of multi-collinearity, suggesting that unexpected findings may be an artifact of the sample and what we are estimating or that there is some heterogeneity among perpetrators. It is possible that one or more of the variables in the full model had a suppression effect and increased the predictive validity of empathy, self-esteem, and school belonging. Regardless, given the unexpected change of these three variables in the full model, these specific findings should be interpreted with caution and assessed in future studies.

With caution in mind, it is still worth considering what else might be driving these surprising findings. The current study suggests that having high self-esteem and a sense of school belonging in middle school may increase risk for perpetrating bullying and sexual harassment in high school. It could be that these two factors are related–those with high self-esteem and feelings of popularity also feel connected to school. This portrait of bully perpetrators is reflected in previous studies that have found that some bullies overestimate their peer acceptance (David & Kistner, 2000) or are actually well-integrated into their peer culture, have high levels of peer social support, and are popular (Farmer et al., 2010; Rodkin et al., 2015). These youth might have a variety of friends that engage in varying degrees of bullying and possess recognizable strengths, including attractiveness, social skills, and/or athleticism (Rodkin et al., 2015). Vaillancourt, McDougall, Hymel, and Sunderani (2010, p. 218) go so far as to call these socially connected youth "Machiavellian:" "popular, socially skilled and competent… [with] high self-esteem… [and] low on psychopathology." It is possible that similar mechanisms may explain sexual harassment perpetration. Additionally, one review of aggression, crime, and violence literature suggests that high self-esteem may lead to violence if it is disputed by an external person or situation (e.g., threatened egotism; Baumeister, Smart, & Boden, 1996).

Like self-esteem, increased levels of empathy was surprisingly associated with higher odds of belonging to the *high all* group rather than the *low all* group. It is unclear why this is the case because empathy has been found to be a shared protective factor of both sexual harassment and bullying (Endresen & Olweus, 2001; Tharp et al., 2013). However, some research has found stronger relations between bullying perpetration and affective empathy, rather than cognitive empathy (Jolliffe & Farrington, 2006), and others find the opposite (Zych, Ttofi, & Farrington,2017). Our measure was a combination of affective and cognitive

dimensions of empathy, which might have contributed to our finding. Individuals in the *high all* group may also have a heightened positive perception of their ability to understand others given that bullies score high on narcissism (Mitsopoulou & Giovazolias, 2015). Thus, self-reports of empathy may not be accurate among perpetrators, and nonverbal indexes or observations may be more accurate (Carroll & Willmington, 1996; Eisenberg & Fabes, 1990).

The current study findings have important prevention implications. Given the large percentage of youth engaging in traditional and cyber bullying perpetration, prevention programming that addresses *both* traditional and cyber bullying may be beneficial. Moreover, bullying prevention efforts will likely be strengthened if they include traditional and cyber sexual harassment perpetration prevention messaging because a high-risk subgroup exists that engages in both forms of aggression, and other research has also shown that bullying perpetration in early adolescence can be a precursor to sexual harassment perpetration (Espelage et al., 2012, 2015). Starting early with a focus on primary prevention of bullying and sexual harassment might also prevent sexual violence in high school and adulthood (Espelage, Basile, Leemis, Hipp, & Davis, 2018; White & Smith, 2004). Our findings also suggest that program content addressing anger, conceptions of masculinity, pornography consumption, social support, school belonging, and parental monitoring in middle school may be particularly relevant.

This study's longitudinal design allowed for an examination of middle school risk and protective factors predicting later violence perpetration, and demonstrates the practicality of intervention in or prior to middle school. Moreover, because risk and protective factors were identified based on participants' perceptions of factors across the social ecology, comprehensive prevention models that include individual, interpersonal, and community components are likely important in preventing the interwoven and complex nature of traditional and cyber bullying and sexual harassment. The CDC's recently published technical packages for prevention of youth violence and sexual violence highlight promising approaches across domains, including teaching adolescents healthy emotional and interpersonal skills, engaging parents and teachers in prevention, and creating protective physical and social school environments (Basile et al., 2016; David-Ferdon et al., 2016). Results also reinforce the need to address shared risk and protective factors (Wilkins, Tsao, Hertz, Davis, & Klevens, 2014).

While results from this longitudinal study help inform future prevention efforts, study limitations exist. First, although the sample was diverse, surveys were conducted in one Midwestern community so results may not be generalizable elsewhere. Second, bullying and sexual harassment perpetration measurement was limited to school settings, and item responses were dichotomized according to whether participants endorsed any perpetration. Thus, we did not assess variations in perpetration frequency. Third, this study only examined risk and protective factors among youth who perpetrated bullying and sexual harassment; findings and implications may be different for youth who are both perpetrators and victims. Fourth, although missingness was accounted for in analyses, missing data may influence results if not truly missing at random. That is, associations found may be due to an

unobserved third variable not accounted for in the models, such as fear or injury from bullying or sexual harassment.

The current study contributes to our understanding of the co-occurrence of traditional and cyber bullying and sexual harassment perpetration. While half of students reported low levels of bullying and sexual harassment, a high-risk group of perpetrators emerged with more associated risk factors and less associated protective factors in middle school. These findings suggest that prevention efforts may be more successful at preventing perpetration if they start early in adolescence, address both forms of aggression within traditional and online contexts, and promote a multi-level approach across the social ecology.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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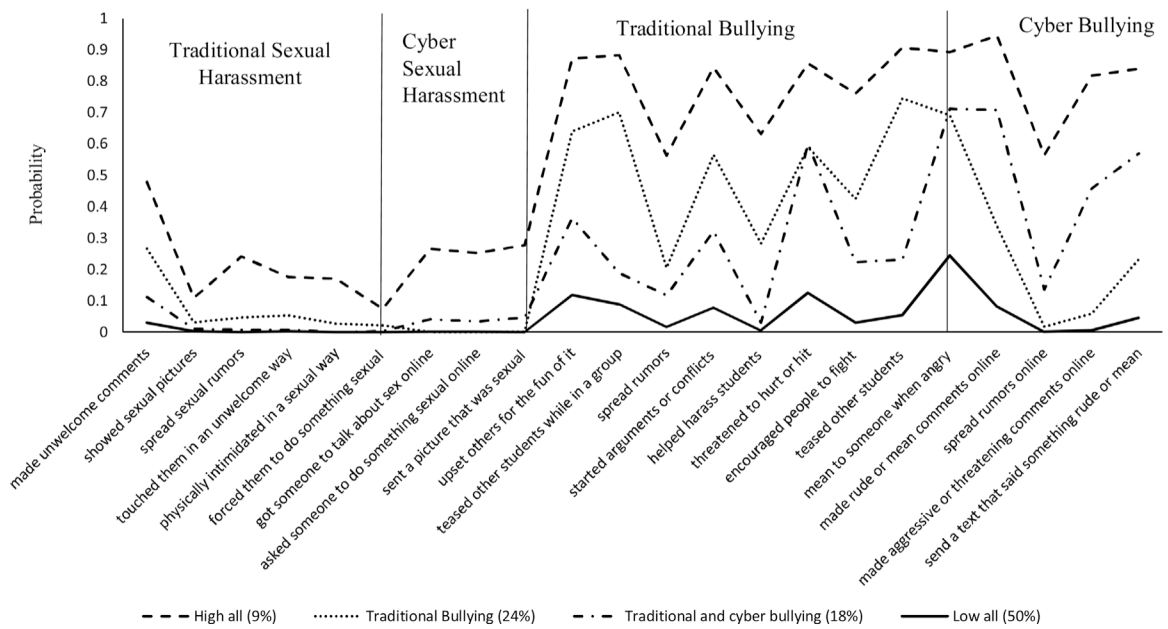
FIGURE 1.
Probabilities of traditional and cyber sexual harassment and bullying endorsement by class.
Note: Items for outcomes of interest were all dichotomized to indicate if a student ever engaged (1) or never engaged (0) in that specific perpetration item during high school (in the last two waves)

TABLE 1

Participant characteristics

Variable	M (SD) or n (%); N = 3549
Demographics	
Age	12.8 (1.08)
Female n (%)	1,781 (50.2)
African-American n (%)	1,638 (46.2)
White n (%)	1,145 (32.2)
Hispanic n (%)	190 (5.4)
Asian/Pacific Islander n (%)	80 (2.3)
Other race n (%)	281 (7.9)
Missing race n (%)	215 (6.0)
Mother high school education n (%)[a]	2484 (70.1)
Study variables	
Traditional Bullying Perpetration	3.81 (5.22)
Cyber Bullying Perpetration	0.74 (1.53)
Traditional Sexual Harassment Perpetration	1.19 (2.19)
Cyber Sexual Harassment Perpetration	0.98 (1.41)
Impulsivity	5.20 (3.84)
Alcohol Use	0.82 (1.75)
Drug use	0.15 (0.47)
Depression	13.9 (7.06)
Empathy	9.03 (3.95)
Self-Esteem	10.6 (4.13)
Anger	1.54 (2.34)
Pornographic Exposure	0.26 (0.55)
Traditional Masculinity	13.2 (3.74)
Dismissiveness of sexual violence	21.3 (4.84)
Peer Delinquency	5.00 (5.63)
Family Conflict & Hostility	0.39 (0.68)
Family Violence	3.38 (3.39)

Variable	M (SD) or n (%); N = 3549
Parental Monitoring	18.0 (6.14)
Social Support	12.1 (3.67)
Positive Neighborhood	2.66 (0.83)
Exposure to Community Violence	5.73 (4.67)
School Belonging	11.7 (2.45)

[a] Mother's education was coded as 1 = high school or below and 0 = more than high school.

TABLE 2

Model fit indices for Latent Class Analysis

No. classes	−2 LL	AIC	BIC	aBIC	Ent.	LMRT	p	VLMR	p	BLRT	p
1 class	43203.5	43067.5	43195.0	43126.1							
2 class	36554.6	36644.6	36907.5	36764.5	.857	6433.2	0.001	6468.83	0.000	6468.8	0.001
3 class	35147.2	35283.4	35680.5	35464.5	.843	1399.5	0.001	1407.26	0.000	1407.3	0.001
4 class	**34549.2**	**34731.2**	**35262.8**	**34973.6**	**.816**	**594.8**	**0.001**	**598.15**	**0.000**	**598.1**	**0.001**
5 class	34085.8	34313.8	34979.7	34617.5	.822	460.8	0.155	463.37	0.153	463.4	0.045

Note: −2LL, negative 2 log likelihood; AIC, Akaike Information Criteria; BIC, Bayesian Information Criteria; aBIC, sample size adjusted Bayesian Information Criteria; Ent., Entropy; LMRT, Lo-Mendell-Rubin test; VLMR, Vuong-Lo-Mendell-Rubin Likelihood Ratio test; BLRT, Bootstrapped log-likelihood ratio test.

TABLE 3

Models 1, 2, and 3. Adjusted odds ratios (AORs) [95% CI] for the High All class, relative to the other groups[a,b]

	Model 1			Model 2			Model 3		
	High All vs. Traditional Bullying	High All vs. Trad/Cyber Bullying	High All vs. Low all	High All vs. Traditional Bullying	High All vs. Trad/Cyber Bullying	High All vs. all	High All vs. Traditional Bullying	High All vs. Trad/Cyber Bullying	High All vs. Low all
Individual									
Impulsivity	**1.11 [1.02, 1.19]**	1.06 [0.97, 1.15]	**1.19 [1.07, 1.32]**						
Alcohol	0.92 [0.75, 1.14]	0.89 [0.72, 1.10]	0.89 [0.68, 1.19]						
Drug	0.71 [0.33, 1.49]	0.59 [0.27, 1.28]	0.54 [0.19, 1.45]						
Depression	0.96 [0.92, 1.01]	**0.93 [0.89, 0.98]**	**0.91 [0.86, 0.96]**						
Empathy	1.01 [0.92, 1.10]	1.03 [0.94, 1.13]	1.09 [0.99, 1.20]						
Self-esteem	1.05 [0.97, 1.14]	1.07 [0.98, 1.16]	0.91 [0.84, 1.01]						
Anger	**1.24 [1.08, 1.41]**	**1.23 [1.05, 1.43]**	**1.64 [1.33, 2.02]**						
Pornographic Exposure	**1.67 [1.09, 2.53]**	**1.86 [1.19, 2.90]**	**3.19 [1.76, 5.80]**						
Traditional Masculinity	**1.15 [1.06, 1.26]**	**1.13 [1.03, 1.23]**	**1.23 [1.11, 1.36]**						
Dismissiveness of Sexual Harass	1.02 [0.95, 1.09]	**1.08 [1.01, 1.17]**	1.07 [0.99, 1.16]						
Relational									
Peer Delinquency				**1.05 [1.01, 1.09]**	1.02 [0.98, 1.07]	**1.14 [1.07, 1.22]**			
Family Conflict & Hostility				0.89 [0.56, 1.43]	0.75 [0.48, 1.20]	0.89 [0.53, 1.47]			
Family Violence				**1.09 [1.01, 1.18]**	1.04 [0.96, 1.13]	**1.14 [1.03, 1.26]**			
Parental Monitoring				0.98 [0.93, 1.03]	0.96 [0.91, 1.01]	0.99 [0.94, 1.04]			
Social Support				**0.92 [0.85, 0.99]**	0.94 [0.85, 1.03]	**0.90 [0.82, 0.98]**			
Community/school									
Positive Neighborhood							**0.69 [0.48, 0.97]**	**0.57 [0.39, 0.84]**	0.80 [0.56, 1.14]
Exposure to Community Violence							**1.11 [1.04, 1.18]**	**1.07 [1.01, 1.13]**	**1.14 [1.07, 1.21]**
School Belonging							1.07 [0.95, 1.24]	1.10 [0.96, 1.24]	1.01 [0.89, 1.15]

[a] All adjusted odds ratios (AORs) were inversed to reference the high all class. AORs above 1 indicate higher odds of being in the high all class in high school and AORs below 1 indicate lower odds of being in the high all class in high school (**bolded AORs indicate confidence intervals that do not include 1**).

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[b] All models controlled for sex (female reference), race (nonwhite reference), maternal education (high school or less reference), age (centered on grand mean), and the following early middle school co-variates traditional and cyber bullying victimization, traditional and cyber bullying perpetration, traditional and cyber sexual harassment victimization, and traditional and cyber sexual harassment perpetration.

TABLE 4

Final model including all social ecological domains. Adjusted odds ratios (AORs) [95% CI] for the High All class, relative to the other groups [a,b]

	Model 4		
	High All vs. Traditional Bullying	High All vs. Traditional/Cyber Bullying	High All vs. Low all
Individual			
Impulsivity	1.02 [0.97, 1.15]	1.02 [0.94, 1.11]	**1.14 [1.03, 1.28]**
Alcohol	0.88 [0.69, 1.12]	0.85 [0.66, 1.09]	0.75 [0.54, 1.04]
Drug	0.57 [0.25, 1.28]	0.46 [0.20, 1.08]	0.35 [0.12, 1.01]
Depression	0.95 [0.89, 1.01]	**0.93 [0.88, 0.98]**	**0.88 [0.82, 0.93]**
Empathy	1.05 [0.95, 1.16]	1.09 [0.97, 1.21]	**1.22 [1.08, 1.37]**
Self-esteem	1.08 [0.98, 1.18]	**1.12 [1.02, 1.23]**	**1.16 [1.05, 1.27]**
Anger	**1.21 [1.04, 1.42]**	**1.20 [1.01, 1.42]**	**1.56 [1.23, 1.94]**
Pornographic Exposure	**1.59 [1.01, 2.50]**	**1.86 [1.15, 3.01]**	**2.74 [1.41, 5.33]**
Traditional Masculinity	**1.12 [1.01, 1.24]**	1.10 [1.00, 1.21]	**1.19 [1.07, 1.34]**
Dismissiveness of Sexual Harassment	1.01 [0.94, 1.09]	1.07 [0.99, 1.16]	1.05 [0.96, 1.14]
Relational			
Peer Delinquency	1.02 [0.96, 1.09]	1.00 [0.94, 1.07]	**1.12 [1.01, 1.23]**
Family Conflict & Hostility	0.99 [0.63, 1.56]	0.95 [0.59, 1.56]	1.24 [0.71, 2.16]
Family Violence	1.05 [0.96, 1.15]	1.02 [0.93, 1.12]	1.05 [0.93, 1.17]
Parental Monitoring	0.96 [0.91, 1.01]	**0.93 [0.87, 0.99]**	**0.94 [0.88, 0.99]**
Social Support	**0.84 [0.76, 0.93]**	**0.84 [0.76, 0.96]**	**0.75 [0.67, 0.85]**
Community/school			
Positive Neighborhood	0.89 [0.59, 1.32]	0.77 [0.50, 1.17]	1.25 [0.81, 1.93]
Exposure to Community Violence	1.01 [0.93, 1.08]	1.01 [0.93, 1.09]	0.99 [0.91, 1.09]
School Belonging	**1.27 [1.09, 1.48]**	**1.25 [1.06, 1.46]**	**1.22 [1.04, 1.43]**

[a] All adjusted odds ratios (AORs) were inversed to reference the high all class. AORs above 1 indicate higher odds of being in the high all class. AORs above 1 indicate higher odds of being in the high all class in high school and AORs below 1 indicate lower odds of being in the high all class in high school (**bolded AORs indicate confidence intervals that do not include 1**).

[b] The final model controlled for sex (female reference), race (nonwhite reference), maternal education (high school or less reference), age (centered on grand mean), and the following early middle school co-variates: traditional and cyber bullying victimization, traditional and cyber bullying perpetration, traditional and cyber sexual harassment victimization, and traditional and cyber sexual harassment perpetration.