International Journal of Bullying Prevention
https://doi.org/10.1007/s42380-024-00264-3

ORIGINAL ARTICLE

Longitudinal Relations Between Cyber Dating Aggression and Cyberbullying in Adolescence

L. Taylor Stevens[1] · Jasmine N. Coleman[2] · Tracy E. Waasdorp[3,4] · Krista R. Mehari[1]

Accepted: 12 August 2024

Abstract

Very little research has examined the longitudinal relations between cyber dating aggression and cyberbullying during adolescence, which is important for informing prevention and intervention. This study fills a gap in the literature by examining the longitudinal relations between cyberbullying and cyber dating aggression. Data were collected from 185 ninth-grade students in the southeastern United States who endorsed being in a dating relationship within the past 30 days and participated in two waves of surveys three months apart. The sample was 50.3% female, 91.1% Black, and the mean age was 14.32 years old ($SD = 0.56$). Cyberbullying uniquely predicted subsequent increases in cyber dating aggression. Similarly, cyber dating aggression predicted subsequent increases in cyberbullying. In-person aggression (peer-targeted and dating) did not predict their online counterparts (cyberbullying and cyber dating aggression). Overall, these results indicate that aggression perpetrated online may generalize from one relational context (i.e., peer relationship) to another relationship context (i.e., dating relationship), such that efforts targeted at preventing online aggression in both relationship contexts may be most effective in preventing future online aggression.

Keywords Cyberbullying · Cyber dating aggression · Dating aggression · Bullying · Prevention

Dating aggression and peer-targeted aggression are prevalent during adolescence and are both associated with adjustment difficulties (Borrajo et al., 2015; Kowalski et al., 2014). Aggression can occur across different relational contexts (dating partners vs. peers) or media contexts (in-person vs. cyber; Mehari et al., 2014). Despite adolescents' increasing use of technology to communicate and interact across relationship contexts (Anderson & Jiang, 2018), prior studies on the perpetration of cyber dating aggression and cyberbullying have been conducted in siloes, limiting our understanding of the extent to which adolescents generalize cyber aggression across relationships. The purpose of this study was to investigate the longitudinal relations between cyberbullying and cyber dating aggression perpetration in a predominantly Black sample of adolescent daters.

Peer-Targeted Aggression

Cyberbullying is a form of peer-targeted aggression perpetrated using electronic communication technologies, and it can include a range of behaviors, from electronically communicating physical threats to sharing photos or videos to cause humiliation (Mehari et al., 2014). Cyberbullying is distinguished from in-person bullying in several ways. For example, individuals can anonymously perpetrate aggression online, and there is a lack of supervision or monitoring of behaviors – both of which minimize the potential for negative consequences for the individual perpetrating the aggression (Dooley et al., 2009; Tokunaga, 2010). Most importantly, online aggression is pervasive and can extend beyond the boundaries of in-person aggression, such that

✉ L. Taylor Stevens
laura.t.stevens@vanderbilt.edu

1 Department of Psychology and Human Development, Vanderbilt University, 230 Appleton Pl, Nashville, TN 37203, USA

2 Department of Psychology, University of Tennessee, Austin Peay Building, 1404 Circle Dr, Knoxville, TN 37916, USA

3 Center for Violence Prevention, Children's Hospital of Philadelphia, 2716 South St, 13th floor, Philadelphia, PA 19146, USA

4 Department of Psychiatry, University of Pennsylvania School of Medicine, 3400 Civic Center Blvd, Philadelphia, PA 19104, USA

Published online: 19 August 2024

adolescents continue to experience online aggression in places that may typically serve as a safe space (e.g., home; Englander et al., 2017; Patchin & Hinduja, 2006; Slonje & Smith, 2008; Tokunaga, 2010). In a meta-analysis, mean prevalence rates for in-person bullying and cyberbullying among adolescents were 35% and 15%, respectively (Modecki et al., 2014).

Cyberbullying is correlated with in-person bullying (Espino et al., 2022; Raskauskas & Stoltz, 2007; Waasdorp & Bradshaw, 2015). In the meta-analysis previously referenced, Modecki et al. (2014) found that correlations between in-person aggression and cyberbullying were relatively strong, particularly when comparing in-person relational aggression to cyberbullying. This link remains robust when examined longitudinally. In a systematic review including studies that examined the longitudinal relations between in-person bullying and cyberbullying, twelve studies found that in-person bullying predicted cyberbullying (Camerini et al., 2020). In fact, one study provided evidence for the temporal relation of cyberbullying predicting in-person bullying at a later time (Jose et al., 2012). At the within-person level, Camacho et al. (2023) demonstrated the cross-lagged bidirectional link between in-person bullying and cyberbullying such that in-person and cyberbullying predicted each other over time. Although evidence for the connection between in-person aggression and cyberbullying is robust, little is known about whether and how peer-targeted cyberbullying is associated with cyber dating aggression over time.

Dating Aggression

Cyber dating aggression is the use of electronic communication technologies to harm, threaten to harm, or control a current or former dating partner. It can include harassing, monitoring (e.g., text messages, social media, geographical location), and humiliating through social media (Cava et al., 2020; Draucker & Martsolf, 2010; Melander, 2010). Cyber dating aggression is distinct from in-person dating aggression such that electronic communication technologies can be used to monitor and control a dating partner's behaviors (e.g., text messages, social media, geographic location). It also provides a continuous platform for the escalation of arguments beyond the boundaries of in-person interactions (e.g., frequent phone calls and texts; Draucker & Martsolf, 2010; Stephenson et al., 2018) and an unlimited audience for conflict if perpetrated through social media (Stonard, 2020). Based on a meta-analysis, observed prevalence rates have ranged from 8 to 58% for cyber dating aggression perpetration (Li et al., 2023). Although there is variability in prevalence rates across studies, the overall prevalence of cyber dating aggression was calculated to be 24%, indicating a notable problem of cyber aggression among adolescent daters (Li et al., 2023). The prevalence of cyber dating aggression perpetration among girls is similar to the prevalence among boys, although the perpetration of sexual cyber dating aggression or more severe physical dating aggression is higher among boys (Burke et al., 2011; Reed et al., 2017; Zweig et al., 2013).

There is a strong link between in-person and cyber dating aggression. A systematic review conducted by Rodríguez-deArriba et al. (2024) found 24 studies establishing the positive correlation between in-person and cyber dating aggression. Four studies cross-sectionally demonstrated the positive relation between in-person and cyber dating aggression across adolescents and adults using regression analyses (Borrajo et al., 2015; Doucette et al., 2021; Duerksen and Woodin, 2021; Kernsmith et al., 2018), but very little research has examined longitudinal relations. Two studies have found no longitudinal support for in-person dating aggression as a predictor of cyber dating aggression (e.g., Lu et al., 2021; Temple et al., 2016). However, and perhaps more interesting, cyber dating aggression has been shown to predict in-person physical dating aggression perpetration (Lu et al., 2021). This study provided quantitative evidence for qualitative work that emerged two years prior. Hellevik (2019) interviewed 21 adolescents with cyber dating aggression experiences and found aggression to often be initiated online and later extended to in-person aggression. Considering the overlap between forms of violence (in-person and cyber), it is important to understand the extent to which violence extends across relationship contexts (peer and dating).

Overlap between Peer-Targeted and Dating Aggression

Most research that examines cyber and in-person aggression is conducted within one relationship context, but less research has examined the extent to which cyber aggressive behaviors extend to other relationship contexts (e.g., peer relationships to dating relationships). Adolescents' perpetration of peer-targeted aggression may increase their risk of perpetrating dating aggression and vice versa. From a social learning framework (Bandura, 1986), adolescents observe and mimic behavior that is perceived to be effective in achieving goals from significant people in their lives. For example, when parents model aggressive behavior (e.g., domestic violence), youth are more likely to be involved in violent dating relationships (Stith et al., 2000). Although most studies have identified in-person peer aggression as a precursor to dating aggression, social learning theory posits this relation could be reciprocal. For example, if aggressive behaviors are observed or used and learned to be effective in dating relationships, these behaviors might extend to peer relationships. As such, adolescents might use similar behaviors they experience or display in their dating relationships within their peer relationships, and vice versa.

Despite the need to understand how online aggressive behaviors are transferred from one relationship to another, the connection between peer-targeted aggression and dating aggression has primarily been focused on in-person forms. Many early romantic attachments develop within the context of peer groups (Connolly et al., 2000), which may place adolescents who engage in peer-targeted bullying at risk for developing unhealthy relationship patterns with dating partners (Foshee et al., 2014). A meta-analysis examining 20 studies found that bullying was strongly related to dating aggression perpetration and remained so after controlling for gender, race or ethnicity, age, prior dating aggression experiences, exposure to family violence, and other adjustment-related outcomes (e.g., depression; Zych et al., 2021). This is supported by several studies that have identified in-person bullying as a longitudinal precursor to in-person dating aggression (Cutbush et al., 2021; Ellis et al., 2013; Humphrey & Vaillancourt, 2020; Miller et al., 2013; Zych et al., 2021). A limited number of studies investigated the extent to which in-person bullying and cyber dating aggression were related, and the findings are mixed. For example, one study among youth living in Spain and four Latin American countries found no evidence for the relation between in-person bullying and cyber dating aggression (Martínez Soto et al., 2024). On the other hand, a study conducted among adolescents living in the Southwestern United States found that students who experienced or perpetrated in-person bullying were more likely to report cyber dating aggression compared to students with no bullying experiences (Van Ouytsel et al., 2017). Little to no research, that we are aware of, has examined whether dating aggression precedes and predicts peer-targeted aggression. However, as previously mentioned, social learning theory postulates that behaviors learned in any relationship context are likely to extend to other relationship contexts (Bandura, 1986). To better understand the overlap between cyberbullying and cyber dating aggression, it is critical to test whether these behaviors in one relationship context bidirectionally predict each other.

Building on theory and past research regarding the relation between in-person bullying and dating aggression, it is likely this relation exists for forms of cyber aggression. Despite compelling evidence that in-person bullying can be a precursor to in-person dating aggression (e.g., Cutbush et al., 2021; Zych et al., 2021), little research has examined the relation between cyberbullying and cyber dating aggression. Preliminary research among predominantly White cross-sectional samples of adolescents has found a positive relation between cyberbullying and cyber dating aggression perpetration (Yahner et al., 2015; Zweig et al., 2019). Additionally, Espino et al. (2022) examined the extent to which adolescents in Spain engaged in aggression across multiple forms and relationship contexts (i.e., poly-aggression) using cross-sectional data. Of adolescents with dating experiences, 72.9% of them perpetrated at least two or three types of aggression (e.g., cyberbullying, dating aggression, cyber dating aggression, bullying, or sexual harassment; Espino et al., 2022). Major limitations of the current literature are the lack of longitudinal data and data collected from samples of Black adolescents. Considering that adolescents of color are at the highest risk for dating aggression (Foshee et al., 2010), it is critical to understand these mechanisms in more diverse samples and/or beyond samples of predominantly White adolescents.

Current Study

The overarching aim of this study was to investigate the extent to which cyberbullying and cyber dating aggression longitudinally and reciprocally predict each other. Since the literature has focused on predominantly White samples of adolescents, this study expands the literature by focusing on longitudinal data from a predominantly Black sample of adolescent daters. There is overwhelming evidence for the association between forms of violence (i.e., cyber vs. in-person) within the same relationship context, but little to no research has examined the longitudinal relation between cyber aggression across relationship contexts (i.e., peers and dating partners). Considering preliminary findings of the cross-sectional association between cyberbullying and cyber dating aggression (Yahner et al., 2015; Zweig et al., 2019), we hypothesize that cyberbullying at Wave 1 will predict increases in cyber dating aggression three months later, after controlling for cyber dating aggression and in-person dating aggression aggression at Wave 1. Drawing on social learning theory (1986), we predict this relation will be reciprocal, and hypothesize that cyber dating aggression at Wave 1 will predict increases in cyberbullying three months later, after controlling for cyberbullying and in-person, peer-targeted aggression at Wave 1. Because of the documented overlap between victimization and perpetration in both peer-targeted and dating aggression (Whiteside et al., 2013; Ybarra et al., 2016), we will control for within-form victimization in each of the models.

Method

Participants and Setting

We conducted secondary data analysis of data from participants attending ninth grade in a Title I high school (e.g., public schools in which a significant percentage of students from low-income families receive supplemental federal funds to support educational opportunities; Snyder et al., 2019) in the southeastern United States who participated in a larger study of healthy relationships.

Administrators from the participating high school noted concerns about violence in their school and partnered with the researchers to understand and prevent violence in their student body. This partnership allowed for the recruitment of Black youth living in a highly segregated and under-resourced community, who often constitute hard-to-reach populations for survey research. This high school served a community with a high proportion of families living below the Federal poverty line, evidenced by 86.2% of youth qualifying for federally subsidized meal eligibility. All ninth-grade students who were not in self-contained classrooms were recruited to participate in the study. Of the 306 eligible students, none of their parents or guardians opted them out of the study, but approximately 7% of eligible students did not provide assent. In the current study, participants were excluded from analyses if they had not dated anyone in the last 30 days ($n = 96$) or if they had limited English proficiency ($n = 1$). The final analytic sample included 185 daters. The attrition rate was less than 5%, with all but two participants completing both waves of data collection.

Most of the participants identified as African American or Black (91.1%); 2.8% identified as another race or ethnicity; 2.2% identified as White; 2.2% identified as Alaska Native or American Indian; and 1.7% identified as Latiné or Hispanic. About half of the sample identified as female (50.3%); 48.6% identified as male; and 1.1% identified as nonbinary. Participants were an average of 14.32 years old ($SD = 0.56$).

Procedures

All procedures were approved by the institution's Institutional Review Board, by the administration in the school district's central office, and by the specific school's administration. All procedures were per the ethical standards outlined in the 1964 Declaration of Helsinki (World Medical Association, 2013). Data were collected in August 2019 (Wave 1) and again in December 2019 (Wave 2). Letters were sent home to parents or legal guardians, who had the opportunity to opt their child out of the study. Active written assent was provided by each participant prior to data collection. Students were eligible to participate in the study if they read or spoke English; attended regular education classes; were present during the days of data collection; their parents or legal guardians did not opt out; and students gave active consent. Participants completed online surveys using Qualtrics during a classroom period in groups of approximately 25 students. Research staff were present to answer questions regarding the survey. Surveys lasted approximately 30 min, and students were given $5 as an incentive for participation.

Measures

Peer-targeted Aggression

The Problem Behavior Frequency Scales-Adolescent Report (Farrell et al., 2018) was used to assess physical, relational, and cyberbullying perpetration, and cyberbullying victimization. Students reported the frequency of the specific behaviors over the past 30 days using a 6-point anchored scale, ranging from 1 (*never*) to 6 (*20 or more times*). Physical aggression was assessed using five items and demonstrated strong reliability (e.g., "Hit or slapped someone," and, "Shoved or pushed someone;" Cronbach's alpha = 0.80). Relational aggression was assessed using six items and demonstrated adequate reliability (e.g., "Told someone you wouldn't like them unless they did something you wanted;" Cronbach's alpha = 0.72). Cyberbullying was assessed using five items and also demonstrated acceptable reliability (e.g., "Used a chat room or internet website to make fun of someone;" Cronbach's alpha = 0.76). The same items were used to assess cyberbullying victimization, except they were altered to fit for victimization (e.g., "Used a chat room or internet website to make fun of you;" Cronbach's alpha = 0.92).

Dating Aggression

The Dating Violence Scale (Foshee et al., 1998) was used to assess in-person dating aggression and victimization. First, students were asked to report whether they had a boyfriend or girlfriend (someone that they dated or gone out with) in the past three months using dichotomous yes or no response options. If the student reported "yes," then the student answered how frequently they perpetrated specific behaviors against their boyfriend or girlfriend, and how frequently they were victimized by their boyfriend or girlfriend. Responses were rated on a 4-point scale ranging from 1 (*never*) to 4 (*10 or more times*). In-person dating aggression perpetration was assessed using nine items and demonstrated strong reliability (e.g., "Damaged something that belonged to him or her," or, "Said things to hurt his or her feelings on purpose;" Cronbach's alpha = 0.89). In-person dating aggression was analyzed as a single factor and was not separated into distinct factors for physical and psychological aggression due to previous research testing the psychometric properties of this measure among a sample of middle school youth. Confirmatory factor analyses revealed the best-fitting model to be two factors (e.g., one for victimization and one for perpetration) that combined the physical and psychological items (Goncy et al., 2016).

Cyber Dating Aggression

Participants who reported being in a dating relationship in the past three months were asked to respond to three items designed to assess cyber dating aggression perpetration, which demonstrated adequate reliability (e.g., "Wrote nasty things about him or her online;" Cronbach's alpha = 0.75). The same items were used to assess cyber dating aggression victimization, except they were paralleled to reflect victimization experiences (e.g., "Wrote nasty things about you online;" Cronbach's alpha = 0.65). Two of the cyber dating aggression items were developed by Zweig and colleagues (e.g., "Used your social networking account without permission," and, "Wrote nasty things about you online;" 2013), and one item was adapted from Picard (2007) for the Zweig et al. (2013) study (e.g., "Sent him or her messages to have sex with me when I knew he or she did not want to").

Analysis Plan

IBM SPSS Statistics Version 28.0 (IBM Corp., 2021) was used to conduct all analyses. To account for missing data, we employed an imputation method using the Expectation–Maximization (EM) technique (Dong & Peng, 2013). All variables of interest were log-transformed to account for nonnormality. First, descriptive statistics and prevalence estimates were calculated for all of the study variables. Next, Pearson bivariate correlation analyses were conducted to investigate the correlations among the study variables. One-way analysis of variance models were conducted to examine gender differences in in-person and online bullying and dating aggression perpetration. Then, separate hierarchical regression analyses were conducted to examine relations between peer-targeted and dating aggression. In the first model that predicted Wave 2 cyber dating aggression, gender (dummy coded with male gender as the reference group) and Wave 1 cyber dating aggression and cyber dating aggression victimization were entered in the first step. Wave 1 in-person dating aggression and cyberbullying were entered in the second step. In the second model that predicted Wave 2 cyberbullying, gender (dummy coded with male gender as the reference group) and Wave 1 cyberbullying and cyberbullying victimization were entered in the first step. Wave 1 physical aggression, relational aggression, and cyber dating aggression were entered in the second step. The significance of all tests was evaluated at $p < 0.05$. Results are presented in standardized beta weights. The standardized beta weights are effect sizes (ES), which are interpreted such that between 0.10 and 1.29 is small, 0.30 and 0.49 is medium, and 0.50 and greater is considered a large ES.

Results

Physical aggression was the most prevalent form of peer-targeted aggression perpetrated at least one time in the past month (83%), followed by relational aggression (69%), and cyberbullying (48%). In-person aggression was the most prevalent form of dating aggression (57%), followed by cyber dating aggression (22%). Approximately 60% of participants reported cyberbullying victimization and 26% reported cyber dating aggression victimization in the past month. Means, standard deviations, and correlations among Wave 1 measures are reported in Table 1. Correlations among distinct constructs were significant and in the anticipated direction. Correlations among the three peer-targeted aggression measures (i.e., physical aggression, relational aggression, and cyberbullying) were highly correlated and ranged from 0.46 to 0.65. The correlation among the two dating aggression measures (i.e., cyber dating aggression and in-person dating aggression) was also highly correlated ($r = 0.62$). Correlations among the three peer aggression measures and two dating aggression measures were small-to-moderate, ranging from 0.23 to 0.39.

One-way analysis of variance models indicated no significant mean differences based on gender in Wave 1 physical peer-targeted aggression ($F[1, 179] = 0.32$, $p = 0.57$), relational peer-targeted aggression ($F[1, 179] = 0.13$, $p = 0.72$),

Table 1 Means, Standard Deviations, and Correlations for Wave 1 Peer and Dating Aggression

Variable	1	2	3	4	5	6	7
1. Physical peer aggression	–						
2. Relational peer aggression	.46***	–					
3. Cyberbullying	.65***	.64***	–				
4. In-person dating aggression	.43***	.34***	.39***	–			
5. Cyber dating aggression	.23***	.27***	.29***	.62***	–		
6. Cyberbullying victimization	.33***	.35***	.31***	.31***	.21**	–	
7. Cyber dating victimization	.25***	.27***	.37***	.62***	.61***	.36***	–
Means	1.99	1.49	1.44	1.36	1.20	1.43	1.23
SD	.87	.58	.65	.60	.56	.68	.60

$N = 185$. *$p < .05$. **$p < .01$. ***$p < .001$

cyberbullying ($F[1, 179] = 0.67$, $p = 0.42$), and total in-person dating aggression perpetration ($F[1, 179] < 0.01$, $p = 0.99$). However, there was a significant gender difference for cyber dating aggression perpetration ($F[1, 179] = 3.88$, $p = 0.05$), such that male adolescents ($M = 1.28$, $SD = 0.66$) reported higher levels of cyber dating aggression compared with female adolescents ($M = 1.12$, $SD = 0.45$).

Cyber Dating Aggression Perpetration Model

First, the extent to which changes in cyber dating aggression were predicted by cyberbullying, while controlling for gender, in-person dating aggression, cyber dating aggression perpetration, and cyber dating aggression victimization at Wave 1 was examined (see Table 2). Cyber dating aggression remained moderately stable from Wave 1 to Wave 2, $\beta = 0.61$, $t\,(179) = 8.02$, $p < 0.001$. Cyber dating aggression victimization at Wave 1 did not significantly predict cyber dating aggression perpetration at Wave 2. Adding in-person dating aggression and cyberbullying significantly improved the prediction, $\Delta R^2 = 0.05$, $\Delta F(2, 177) = 8.27$, $p < 0.001$. Cyberbullying predicted increases in Wave 2 cyber dating aggression, $\beta = 0.19$, $t\,(177) = 3.21$, $p < 0.01$. In-person dating aggression did not significantly predict Wave 2 cyber dating aggression.

Cyberbullying Perpetration Model

Next, the degree to which changes in cyberbullying perpetration were predicted by cyber dating aggression, while controlling for gender, in-person peer-targeted physical and relational aggression, cyberbullying, and cyberbullying victimization at Wave 1 was examined (see Table 3). Cyberbullying remained moderately stable across Waves 1 and 2, $\beta = 0.52$, $t\,(179) = 7.75$, $p < 0.001$. Cyberbullying victimization at Wave 1 did not significantly predict cyberbullying at Wave 2. Adding physical and relational peer-targeted aggression, and cyber dating aggression significantly improved the prediction of the model, $\Delta R^2 = 0.05$, $\Delta F(3, 176) = 4.51$, $p = 0.01$. Cyber dating aggression predicted increases in Wave 2 cyberbullying, $\beta = 0.20$, $t\,(176) = 3.01$, $p < 0.01$. Physical and relational peer-targeted aggression did not significantly predict Wave 2 cyberbullying.

Table 2 Standardized Regression Coefficients (Standard Errors) for Models Regressing Wave 2 Cyber Dating Aggression on Wave 1 In-person Dating Aggression and Cyberbullying

Variable	$F\Delta$ (*df*)	$R^2\Delta$	β
Step 1	45.95 (3, 179)***	.44***	
Gender			-.03
Cyber dating aggression			.61***
Cyber dating victimization			.06
Step 2	8.27 (2, 177)***	.05***	
Gender			-.06
Cyber dating aggression			.54***
Cyber dating victimization			-.05
In-person dating aggression			.14
Cyberbullying			.19**

$N = 185$. *$p < .05$. **$p < .01$. ***$p < .001$

Table 3 Standardized Regression Coefficients for Models Regressing Wave 2 Cyberbullying on Wave 1 In-person Peer Aggression and Cyber Dating Aggression

Variable	$F\Delta$ (*df*)	$R^2\Delta$	β
Step 1	22.05 (3, 179)***	.27***	
Gender			-.11
Cyberbullying			.52***
Cyberbullying victimization			-.02
Step 2	4.51 (3, 176)**	.05**	
Gender			-.06
Cyberbullying			.35***
Cyberbullying victimization			-.05
Physical peer aggression			.11
Relational peer aggression			.07
Cyber dating aggression			.20**

$N = 185$. *$p < .05$. **$p < .01$. ***$p < .001$

Discussion

The purpose of this study was to examine the longitudinal relations between cyber dating aggression and cyberbullying in a sample of students predominantly identifying as Black, and attending a school that was situated in a highly segregated and disinvested community in the southeastern United States. Black adolescents are at a higher risk for experiencing or perpetrating dating aggression compared to White adolescents, but are underrepresented in the cyber dating and cyberbullying bodies of research; thus, this study addresses a gap in the literature (Foshee et al., 2010). Cyber dating aggression uniquely predicted increases in subsequent cyberbullying three months later. Similarly, cyberbullying uniquely predicted subsequent increases in cyber dating aggression. Of note, these patterns of prediction were observed even when controlling for multiple other forms of aggression and within-form victimization, providing a rigorous test of the hypotheses. Despite evidence for the consistent co-occurrence of within-form victimization and perpetration (Whiteside et al., 2013; Ybarra et al., 2016), cyber aggression in one relationship context best explained the changes in cyber aggression in the other relationship context. Regarding gender differences across in-person and

cyber peer-targeted and dating aggression, the only significant difference observed was for cyber dating aggression. Boys reported higher instances of cyber dating aggression. Most studies found girls to perpetrate higher or similar rates to boys with the exception of more severe forms of cyber dating aggression (e.g., sexual coercion; Burke et al., 2011; Reed et al., 2017; Zweig et al., 2013). This study did not differentiate between different forms of cyber dating aggression (i.e., sexual vs control or monitoring). Because of this, it is possible that the gender differences typically observed across forms of cyber dating aggression were obscured by including them in a single score.

Relations between Cyberbullying and Cyber Dating Aggression

As hypothesized, cyber dating aggression predicted subsequent increases in cyberbullying and vice versa. This longitudinal research extends the findings of previous research that found cross-sectional relations between cyberbullying and cyber dating aggression (Espino et al., 2022; Yahner et al., 2015; Zweig et al., 2019). Cyber aggressive behaviors perpetrated in one relationship context (i.e., peer relationships) predict increases in similar behaviors in another relationship context (i.e., dating relationships) above and beyond victimization and in-person forms of aggression in the same relationship context. Our results extend previous findings by documenting the longitudinal, reciprocal relation between cyberbullying as a predictor of subsequent increases in cyber dating aggression and cyber dating aggression as a predictor of increases in cyberbullying.

These findings align with social learning theory, such that behaviors learned to be effective are reinforced and repeated across relationship contexts (Bandura, 1986). Developmentally, peer relationships can begin in early childhood, long before people enter dating or romantic relationships, which is most commonly initiated in early adolescence (12 and a half for girls and 13 and a half for boys) in the United States (Greydanus & Bashe, 2005). In addition, dating relationships are typically entered into when mixed-gender peer groups split off into pairs, such that an adolescent's dating partner was very likely in the same peer group prior to the initiation of the dating relationship (Connolly et al., 2000; Dunphy, 1963). Therefore, it makes logical sense that cyberbullying toward peers would predict increases in cyber dating aggressive behaviors during mid-adolescence. More interesting, perhaps, is that cyber dating aggression predicted increases in cyberbullying perpetration. Our results additionally provided evidence that online aggression in dating relationships predicts online aggression in peer relationships. Although most studies focusing on in-person aggression provided evidence only for bullying predicting dating aggression, social learning theory suggests that behaviors learned to be effective in achieving goals could transfer from one relationship context to another. It is possible that regardless of which context online aggression was learned and reinforced in, it might extend to other online relationship contexts.

Relations between In-Person and Online Behaviors

Interestingly, in-person peer and dating aggression did not predict their online counterparts (i.e., cyberbullying and cyber dating aggression, respectively). This aligns with previous studies that have examined the longitudinal relation between in-person and cyber dating aggression. For example, in an ethnically diverse group of high school students, in-person dating aggression (physical and psychological) did not predict cyber dating aggression one year later (Temple et al., 2016). Similarly, Lu et al. (2021) found that in-person dating aggression perpetration did not predict cyber dating aggression across three time points in two years. However, they did find that cyber dating aggression perpetration predicted subsequent in-person perpetration (Lu et al., 2021). This has also been supported by qualitative data from 21 Norwegian teenagers who discussed the initiation of dating aggression online through text messaging and social media, which subsequently continued in person (Hellevik, 2019). On the other hand, there is substantial evidence to suggest that in-person bullying longitudinally predicts cyberbullying (Camacho et al., 2023; Camerini et al., 2020; Jose et al., 2012), which was not supported in our study. Each of these studies was conducted with samples from other countries (Australia, New Zealand, Spain, and New Zealand, respectively), whereas our sample included participants from the United States. This suggests there might be cultural differences accounting for the discrepancies in our findings and previous research. The absence of a significant longitudinal relation between in-person and online aggression in our study might suggest that these online behaviors stabilize earlier than high school age, such that the presence of in-person aggression would not increase aggressive behaviors online three months later, and future studies should examine this.

Limitations

This study has some limitations. For example, the survey did not include questions about gender identity or sexual orientation. Adolescents who identify as members of the LGBTQIA community, particularly those with intersectional identities such as also being Black, are at a higher risk for dating aggression experiences compared to adolescents who identify as cis-gender or heterosexual (Dank et al., 2014). The lack of sexual orientation and gender identity information limited our ability to detect variability in our models based on those characteristics. In addition, the measure of peer-targeted aggression does not explicitly

state that respondents should only include behaviors that have happened with someone they have not dated (the phrasing asked the extent to which this was perpetrated by or on "another kid" or "another teen"). This could have inflated the relation between peer and dating aggression. However, the correlation between cyber dating aggression and cyberbullying was moderate ($r = 0.62$), which is fairly typical for relations among different forms of aggression. This implies they are distinct constructs, and it is unlikely to be a major concern. Another issue is that the dating violence measure did not include sexual dating violence; this was to adhere to the school system's request to avoid questions about sex. However, more research should be conducted to explore the overlap between sexual dating violence and cyber dating aggression.

Implications for Research and Practice

The findings in this study have important implications for research and practice. In this sample, the perpetration of cyber aggression in one relationship (i.e., dating) longitudinally predicts cyber aggression perpetration in other relationship contexts (i.e., peer). The reciprocity of these behaviors in peer and dating relationships highlights the importance of prevention efforts to target both relationship contexts. Although effective, interventions designed to target cyber aggression have been operating in siloes (i.e., either peer-targeted or dating-targeted) and might be insufficient in mitigating these behaviors in both relationship contexts (Doty et al., 2022; Galende et al., 2020). We also found that in-person aggression did not predict their online counterparts. This underscores the role of cyber interventions and their effectiveness in reducing aggression online. Interventions focused solely on in-person aggression might not be effective for reducing behaviors online, particularly for participants in our sample.

Future directions

Future research should expand its samples to include adolescents from other racial/ethnic backgrounds, gender identities, sexual orientations, and other geographical regions to further understand the relation between aggressive behaviors across relationship contexts (i.e., peers vs. dating relationships) and media contexts (i.e., in-person vs. online). Additionally, further research should focus on earlier periods of development in children to identify the onset of cyber aggressive behaviors due to the possibility that online behaviors might stabilize earlier in adolescence, thereby limiting our ability to detect longitudinal changes. Lastly, future research should examine the longitudinal relation between cyberbullying and cyber dating aggression among larger samples to allow for more advanced statistical modeling techniques, such as cross-lagged panel analyses.

Authors' Contributions TS, JC, and KM conceived the study and drafted the manuscript. JC conducted the analyses. KM designed the study and contributed to the acquisition of the data. All authors participated in interpreting the results and revising the manuscript critically for intellectual content.

Funding This work was funded by an internal grant from the University of South Alabama awarded to the fourth author and by the Centers for Disease Control and Prevention, CDC, R01-CE-003298. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Data Availability The data from this project can be made available upon request. Individuals may access the dataset with a proposed research plan, approval by their Institutional Review Board, and a signed Data Use Agreement. The data will not be made publicly available to protect the privacy of the participating youth and school. This request can be made to Krista Mehari (email: krista.mehari@vanderbilt.edu).

Code Availability Not applicable.

Declarations

Compliance with Ethical Standards All procedures were approved by the University of South Alabama's Institutional Review Board, by the administration in the school district's central office, and by the specific school's administration. All procedures were per the ethical standards outlined in the 1964 Declaration of Helsinki. All youth participants provided active written consent, and their parents/caregivers provided passive consent by not opting their child out of the survey.

Conflicts of Interest The authors declare they have no actual or perceived conflicts of interest in relation to the study described in this manuscript.

References

Anderson, M., & Jiang, J. (2018). *Teens, social media and technology 2018*. Pew Research Center: Internet, Science & Tech. https://www.pewresearch.org/internet/2018/05/31/teens-social-media-technology-2018/

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory* (pp. xiii, 617). Prentice-Hall, Inc.

Borrajo, E., Gámez-Guadix, M., & Calvete, E. (2015). Cyber dating abuse: Prevalence, context, and relationship with offline dating

aggression. *Psychological Reports, 116*(2), 565–585. https://doi.org/10.2466/21.16.PR0.116k22w4

Burke, S. C., Wallen, M., Vail-Smith, K., & Knox, D. (2011). Using technology to control intimate partners: An exploratory study of college undergraduates. *Computers in Human Behavior, 27*(3), 1162–1167. https://doi.org/10.1016/j.chb.2010.12.010

Camacho, A., Runions, K., Ortega-Ruiz, R., & Romera, E. M. (2023). Bullying and cyberbullying perpetration and victimization: Prospective within-person associations. *Journal of Youth and Adolescence, 52*(2), 406–418. https://doi.org/10.1007/s10964-022-01704-3

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. https://doi.org/10.1016/j.tele.2020.101362

Connolly, J., Pepler, D., Craig, W., & Taradash, A. (2000). Dating experiences of bullies in early adolescence. *Child Maltreatment, 5*(4), 299–310. https://doi.org/10.1177/1077559500005004002

Cutbush, S., Williams, J., Miller, S., Gibbs, D., & Clinton-Sherrod, M. (2021). Longitudinal patterns of electronic teen dating violence among middle school students. *Journal of Interpersonal Violence, 36*(5–6), 5–6. https://doi.org/10.1177/0886260518758326

Dank, M., Lachman, P., Zweig, J. M., & Yahner, J. (2014). Dating violence experiences of lesbian, gay, bisexual, and transgender youth. *Journal of Youth and Adolescence, 43*(5), 846–857. https://doi.org/10.1007/s10964-013-9975-8

Dong, Y., & Peng, C.-Y.J. (2013). Principled missing data methods for researchers. *Springerplus, 2*(1), 222. https://doi.org/10.1186/2193-1801-2-222

Dooley, J., Pyżalski, J., & Cross, D. (2009). Cyberbullying versus face-to-face bullying a theoretical and conceptual review. *Journal of Psychology, 217*, 182–188. https://doi.org/10.1027/0044-3409.217.4.182

Doty, J. L., Girón, K., Mehari, K. R., Sharma, D., Smith, S. J., Su, Y. W., Ma, X., Rijo, D., & Rousso, B. (2022). The dosage, context, and modality of interventions to prevent cyberbullying perpetration and victimization: A systematic review. *Prevention Science, 23*(4), 523–537. https://doi.org/10.1007/s11121-021-01314-8

Doucette, H., Collibee, C., Hood, E., Gittins Stone, D. I., DeJesus, B., & Rizzo, C. J. (2021). Perpetration of electronic intrusiveness among adolescent females: Associations with in-person dating violence. *Journal of Interpersonal Violence, 36*(11–12), NP6581–NP6601. https://doi.org/10.1177/0886260518815725

Draucker, C. B., & Martsolf, D. S. (2010). The role of electronic communication technology in adolescent dating violence. *Journal of Child and Adolescent Psychiatric Nursing, 23*(3), 133–142. https://doi.org/10.1111/j.1744-6171.2010.00235.x

Duerksen, K. N., & Woodin, E. M. (2021). Cyber dating abuse victimization: Links with psychosocial functioning. *Journal of Interpersonal Violence, 36*(19–20), 19–20. https://doi.org/10.1177/0886260519872982

Dunphy, D. C. (1963). The social structure of urban adolescent peer groups. *Sociometry, 26*(2), 230–246. https://doi.org/10.2307/2785909

Ellis, W. E., Chung-Hall, J., & Dumas, T. M. (2013). The role of peer group aggression in predicting adolescent dating violence and relationship quality. *Journal of Youth and Adolescence, 42*(4), 487–499. https://doi.org/10.1007/s10964-012-9797-0

Englander, E., Donnerstein, E., Kowalski, R., Lin, C. A., & Parti, K. (2017). Defining cyberbullying. *Pediatrics, 140*(2), S148–S151. https://doi.org/10.1542/peds.2016-1758U

Espino, E., Ortega-Rivera, J., Ojeda, M., Sánchez-Jiménez, V., & Del Rey, R. (2022). Violence among adolescents: A study of overlapping of bullying, cyberbullying, sexual harassment, dating violence and cyberdating violence. *Child Abuse & Neglect, 134*, 105921. https://doi.org/10.1016/j.chiabu.2022.105921

Farrell, A. D., Goncy, E. A., Sullivan, T. N., & Thompson, E. L. (2018). Evaluation of the Problem Behavior Frequency Scale-Teacher Report Form for assessing behavior in a sample of urban adolescents. *Psychological Assessment, 30*(10), 1277–1291. https://doi.org/10.1037/pas0000571

Foshee, V. A., Bauman, K. E., Arriaga, X. B., Helms, R. W., Koch, G. G., & Linder, G. F. (1998). An evaluation of Safe Dates, an adolescent dating violence prevention program. *American Journal of Public Health, 88*(1), 45–50. https://doi.org/10.2105/ajph.88.1.45

Foshee, V. A., McNaughton Reyes, H. L., Vivolo-Kantor, A. M., Basile, K. C., Chang, L. Y., Faris, R., & Ennett, S. T. (2014). Bullying as a longitudinal predictor of adolescent dating violence. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine, 55*(3), 439–444. https://doi.org/10.1016/j.jadohealth.2014.03.004

Foshee, V. A., Reyes, H. L. M., & Ennett, S. T. (2010). Examination of sex and race differences in longitudinal predictors of the initiation of adolescent dating violence perpetration. *Journal of Aggression, Maltreatment & Trauma, 19*(5), 492–516. https://doi.org/10.1080/10926771.2010.495032

Galende, N., Ozamiz-Etxebarria, N., Jaureguizar, J., & Redondo, I. (2020). Cyber dating violence prevention programs in universal populations: A systematic review. *Psychology Research and Behavior Management, 13*, 1089–1099. https://doi.org/10.2147/PRBM.S275414

Goncy, E. A., Farrell, A. D., Sullivan, T. N., & Taylor, K. A. (2016). Measurement of dating aggression during middle school: Structure, measurement invariance, and distinction from general aggression. *Journal of Research on Adolescence: The Official Journal of the Society for Research on Adolescence, 26*(3), 509–523. https://doi.org/10.1111/jora.12208

Greydanus, D. E., & Bashe, P. (2005). *Caring for your teenager*. Bantam Dell.

Hellevik, P. M. (2019). Teenagers' personal accounts of experiences with digital intimate partner violence and abuse. *Computers in Human Behavior, 92*, 178–187. https://doi.org/10.1016/j.chb.2018.11.019

Humphrey, T., & Vaillancourt, T. (2020). Longitudinal relations between bullying perpetration, sexual harassment, homophobic taunting, and dating violence: Evidence of heterotypic continuity. *Journal of Youth and Adolescence, 49*(10), 1976–1986. https://doi.org/10.1007/s10964-020-01307-w

Jose, P. E., Kljakovic, M., Scheib, E., & Notter, O. (2012). The joint development of traditional bullying and victimization with cyber bullying and victimization in adolescence. *Journal of Research on Adolescence, 22*(2), 301–309. https://doi.org/10.1111/j.1532-7795.2011.00764.x

Kernsmith, P. D., Victor, B. G., & Smith-Darden, J. P. (2018). Online, offline, and over the line: Coercive sexting among adolescent dating partners. *Youth & Society, 50*(7), 891–904. https://doi.org/10.1177/0044118X18764040

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

Li, J., Ran, G., Zhang, Q., & He, X. (2023). The prevalence of cyber dating abuse among adolescents and emerging adults: A meta-analysis. *Computers in Human Behavior, 144*, 107726. https://doi.org/10.1016/j.chb.2023.107726

Lu, Y., Van Ouytsel, J., & Temple, J. R. (2021). In-person and cyber dating abuse: A longitudinal investigation. *Journal of Social and Personal Relationships, 38*(12), 3713–3731. https://doi.org/10.1177/02654075211065202

Martínez Soto, A., Lopez-del Burgo, C., Albertos, A., & Ibabe, I. (2024). Cyber dating abuse in adolescents: Myths of romantic love, sexting practices and bullying. *Computers in Human Behavior, 150*, 108001. https://doi.org/10.1016/j.chb.2023.108001

Mehari, K. R., Farrell, A. D., & Le, A.-T.H. (2014). Cyberbullying among adolescents: Measures in search of a construct. *Psychology of Violence, 4*(4), 399–415. https://doi.org/10.1037/a0037521

Melander, L. A. (2010). College students' perceptions of intimate partner cyber harassment. *Cyberpsychology, Behavior and Social Networking, 13*(3), 263–268. https://doi.org/10.1089/cyber.2009.0221

Miller, S., Williams, J., Cutbush, S., Gibbs, D., Clinton-Sherrod, M., & Jones, S. (2013). Dating violence, bullying, and sexual harassment: longitudinal profiles and transitions over time. *Journal of Youth and Adolescence, 42*(4), 607–618. https://doi.org/10.1007/s10964-013-9914-8

Modecki, K. L., Minchin, J., Harbaugh, A. G., Guerra, N. G., & Runions, K. C. (2014). Bullying prevalence across contexts: A meta-analysis measuring cyber and traditional bullying. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine, 55*(5), 602–611. https://doi.org/10.1016/j.jadohealth.2014.06.007

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

Picard, P. (2007). *Tech abuse in teen relationships*. Chicago, IL: Teen Research Unlimited. Retrieved November 24, 2011, from http://www.loveisrespect.org/wp-content/uploads/2009/03/liz-claiborne-2007-tech-relationship-abuse.pdf.

Raskauskas, J., & Stoltz, A. D. (2007). Involvement in traditional and electronic bullying among adolescents. *Developmental Psychology, 43*(3), 564–575. https://doi.org/10.1037/0012-1649.43.3.564

Reed, L. A., Tolman, R. M., & Ward, L. M. (2017). Gender matters: Experiences and consequences of digital dating abuse victimization in adolescent dating relationships. *Journal of Adolescence, 59*, 79–89. https://doi.org/10.1016/j.adolescence.2017.05.015

Rodríguez-deArriba, M.-L., Santos, C., Cunha, O., Sánchez-Jiménez, V., & Caridade, S. (2024). Relationship between cyber and in-person dating abuse: A systematic review. *Aggression and Violent Behavior, 77*, 101943. https://doi.org/10.1016/j.avb.2024.101943

Slonje, R., & Smith, P. K. (2008). Cyberbullying: Another main type of bullying? *Scandinavian Journal of Psychology, 49*(2), 147–154. https://doi.org/10.1111/j.1467-9450.2007.00611.x

Stephenson, V. L., Wickham, B. M., & Capezza, N. M. (2018). Psychological abuse in the context of social media. *Violence and Gender, 5*(3), 129–134. https://doi.org/10.1089/vio.2017.0061

Stith, S. M., Rosen, K. H., Middleton, K. A., Busch, A. L., Lundeberg, K., & Carlton, R. P. (2000). The intergenerational transmission of spouse abuse: A meta-analysis. *Journal of Marriage and Family, 62*(3), 640–654. https://doi.org/10.1111/j.1741-3737.2000.00640.x

Stonard, K. E. (2020). "Technology was designed for this": Adolescents' perceptions of the role and impact of the use of technology in cyber dating violence. *Computers in Human Behavior, 105*, 106211. https://doi.org/10.1016/j.chb.2019.106211

Temple, J. R., Choi, H. J., Brem, M., Wolford-Clevenger, C., Stuart, G. L., Peskin, M. F., & Elmquist, J. (2016). The temporal association between traditional and cyber dating abuse among adolescents. *Journal of Youth and Adolescence, 45*(2), 340–349. https://doi.org/10.1007/s10964-015-0380-3

Tokunaga, R. S. (2010). Following you home from school: A critical review and synthesis of research on cyberbullying victimization. *Computers in Human Behavior, 26*(3), 277–287. https://doi.org/10.1016/j.chb.2009.11.014

Van Ouytsel, J., Torres, E., Choi, H. J., Ponnet, K., Walrave, M., & Temple, J. R. (2017). The associations between substance use, sexual behaviors, bullying, deviant behaviors, health, and cyber dating abuse perpetration. *The Journal of School Nursing, 33*(2), 116–122. https://doi.org/10.1177/1059840516683229

Waasdorp, T. E., & Bradshaw, C. P. (2015). The overlap between cyberbullying and traditional bullying. *Journal of Adolescent Health, 56*(5), 483–488. https://doi.org/10.1016/j.jadohealth.2014.12.002

Whiteside, L. K., Ranney, M. L., Chermack, S. T., Zimmerman, M. A., Cunningham, R. M., & Walton, M. A. (2013). The overlap of youth violence among aggressive adolescents with past-year alcohol use—A latent class analysis: Aggression and victimization in peer and dating violence in an inner city emergency department sample. *Journal of Studies on Alcohol and Drugs, 74*(1), 125–135. https://doi.org/10.15288/jsad.2013.74.125

World Medical Association. (2013). World Medical Association Declaration of Helsinki: Ethical principles for medical research involving human subjects. *JAMA, 310*(20), 2191–2194. https://doi.org/10.1001/jama.2013.281053

Yahner, J., Dank, M., Zweig, J. M., & Lachman, P. (2015). The co-occurrence of physical and cyber dating violence and bullying among teens. *Journal of Interpersonal Violence, 30*(7), 1079–1089. https://doi.org/10.1177/0886260514540324

Ybarra, M. L., Espelage, D. L., Langhinrichsen-Rohling, J., Korchmaros, J. D., & Boyd, D. (2016). Lifetime prevalence rates and overlap of physical, psychological, and sexual dating abuse perpetration and victimization in a national sample of youth. *Archives of Sexual Behavior, 45*(5), 1083–1099. https://doi.org/10.1007/s10508-016-0748-9

Zweig, J. M., Dank, M., Lachman, P., & Yahner, J. (2019). *Technology, Teen Dating Violence and Abuse, and Bullying* (No. 243296). Urban Institute. https://www.urban.org/sites/default/files/publication/23941/412891-Technology-Teen-Dating-Violence-and-Abuse-and-Bullying.PDF

Zweig, J. M., Dank, M., Yahner, J., & Lachman, P. (2013). The rate of cyber dating abuse among teens and how it relates to other forms of teen dating violence. *Journal of Youth and Adolescence, 42*(7), 1063–1077. https://doi.org/10.1007/s10964-013-9922-8

Zych, I., Viejo, C., Vila, E., & Farrington, D. P. (2021). School bullying and dating violence in adolescents: A systematic review and meta-analysis. *Trauma, Violence, and Abuse, 22*(2), 397–412. https://doi.org/10.1177/15248380198544