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Developmental outcomes of using physical violence against dates and peers

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Abstract

Purpose—The negative impact on adolescents of being a *victim* of violence is well documented, but the impact of being a *perpetrator* of violence is less well known. Knowing the negative outcomes of being a perpetrator could inform clinical interactions with adolescents, development of violence prevention strategies, and estimates of the societal burden of violence. This longitudinal study examined the effects of physical dating violence (DV) and peer violence (PV) perpetration on internalizing symptoms, relationships with friends and family, academic aspirations and grades, and substance use.

Methods—The four-wave longitudinal study (N= 3,979), conducted in two North Carolina counties over 2½ years, spanned grades 8 to 12. Generalized linear mixed models were used to examine prospective lagged effects of each type of violence perpetration on each outcome and sex and grade as moderators of effects.

Results—Perpetrating DV significantly predicted lower college aspirations and greater likelihood of marijuana use. The effect of DV perpetration on increased family conflict was moderated by school grade; the effect decreased in significance across grades. Perpetrating PV significantly predicted greater likelihood of cigarette and marijuana use. The effects of PV perpetration on increased internalizing symptoms and alcohol intensity and decreased college aspirations were moderated by school grade; effects decreased in significance across grades. Neither type of

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perpetration predicted changes in number of reciprocated friendships, social status, or academic grades, and no effects varied by sex.

Conclusions—These detrimental outcomes for the perpetrator need to be considered in clinical interactions with adolescents and violence prevention programming.

Keywords

Adolescent dating violence; peer violence; outcomes of violence perpetration

The negative impact on adolescents of being a *victim* of violence is well documented. Adolescent victims may be injured, sometimes fatally, and are at risk for depression, anxiety, suicide, substance use, delinquent behaviors, and poor academic performance [1–5]. Adolescents who *perpetrate* violence may themselves experience negative outcomes that interfere with their development, but this has rarely been examined with empirical research. However, knowing the outcomes for adolescents of using violence against others is important for informing clinical interactions with adolescents, developing violence prevention strategies, and informing estimates of the societal burden of violence. This study 1) examined prospectively a wide range of potential developmental outcomes of perpetrating physical dating violence (DV) and peer violence (PV), and 2) determined whether the outcomes varied by sex of the perpetrator or adolescent development from grades 8 to 12.

A longitudinal study design allows for distinguishing predictors from outcomes of perpetrating violence. Only three studies have used longitudinal data to examine outcomes of adolescent physical DV perpetration, and they examined a limited number of outcomes. One found that DV perpetration predicted later depression [6]; another found that it predicted suicidal ideation [5]; and the third found that it led to changes in social information processing, including an increased tendency to attribute hostile intentions to partners during conflicts and anticipate positive consequences from using violence [7]; only the latter study, however, controlled for temporality in associations [7]. Many studies have examined outcomes of bullying that combined acts of physical and non-physical bullying (personal insults, threats and actions intended to harm relationships) [1,8–12], and of anti-social behaviors that included physical violence perpetration as only one of several behaviors [13–15]. However, the outcomes of physical PV perpetration could not be uniquely distinguished in these studies. The few longitudinal studies that uniquely examined outcomes of physical PV perpetration found that perpetration predicted later substance use [16], and decreased likeability by peers [17], but increased popularity [17,18].

This study used data from a large, multi-wave study of adolescents to examine outcomes of physical DV and PV perpetration across grades 8 through 12. The principle of multifinality, which asserts that a single adverse event (e.g. perpetrating violence) can lead to different outcomes in different people, guided our decision to examine multiple potential outcomes of the perpetration rather than focus on a single outcome. This principle, which is central to theories of developmental psychopathology [19] and has received extensive empirical support [20], suggests that the impact of an adverse event could be underestimated when examining a single outcome. The specific outcomes examined include internalizing symptoms, peer relationships (friendships and social status), academic aspirations and

performance, family relationships (family conflict) and substance use (alcohol, cigarettes, and marijuana use). Each of these outcomes could be proximally affected by perpetration of violence, impact adolescent development, and affect life-course trajectories of physical and mental health, happiness, productivity, and income potential [21]. We hypothesized that DV and PV perpetration would negatively impact all of the outcomes, except for social status, which we hypothesized to be positively impacted by violence perpetration; this latter hypothesis was based on numerous studies which have found that adolescent bullying/ aggression is correlated with high social status, particularly during early adolescence [22].

Historically, girls have been considered less violent than boys; thus many studies examining outcomes of bullying/aggression during adolescence have been limited to boys [9–11]. However, the prevalence of physical DV perpetration is about equal for boys and girls [23], and PV perpetration by girls has risen substantially over time [24]. Both boys and girls are included in the current study, allowing for examination of sex differences in the outcomes of violence, which have been found for both DV [3,4] and PV [2] victimization, though findings have been inconsistent.

We also examined whether outcomes of DV and PV perpetration varied over time. Social, academic, peer, and family environments change considerably across adolescence, as does adolescent social and biological development; thus, outcomes of perpetration could manifest differently across this period. For example, during early adolescence, a time when desire for social status peaks, bullying, which is viewed by peers as challenging adult authority, has been associated with higher social status [25]. However, as adolescents mature and develop higher level cognitive processing skills, aggressive peers may "lose their luster" and become less well tolerated [26]; thus being aggressive may not lead to higher social status in later adolescence.

Methods

Study overview

Data were from a longitudinal cohort sequential study of adolescent health risk. The current study used four waves of data collected over 2½ years starting when participants were in the 8th, 9th or 10th grades (wave 1) and ending when participants were in 10th, 11th, and 12th grades (wave 4). Six-month time intervals separated the first three waves, and a 1-year interval separated waves three and four. Eligible participants were all of the adolescents enrolled in 19 public middle and highs schools in two predominately rural U.S. counties except those who were unable to complete the questionnaire in English (1–4 students per wave), in long-term suspension (1–4 students per wave) or in special education programs (. 04% to .05% of students). Questionnaires were administered in various classrooms by trained data collectors. Schools were provided a monetary incentive to participate. Study information was sent to parents via mail and through the school. Parents could refuse consent for their child's participation by returning a written form or calling a toll-free telephone number. Assent was obtained prior to the survey from adolescents whose parents had not refused consent. The Institutional Review Board at the sponsoring university approved study protocols.

Response rates ranged from 77% at wave 1 to 73% at wave 4. Analyses were conducted with 3,979 adolescents, of whom 7% provided only one wave of data and 73% provided three or more waves of data. About half of the sample were male (49%), approximately 50% were black, 43% white, and the remaining 7% of other race/ethnicities, including Latino, Asian, American Indian, or mixed race.

Measures

DV and PV perpetration—A short version of the Safe Dates Physical Perpetration scale was administered at each wave [27]. Adolescents were asked if they had ever been on a date, defined as "informal activities like meeting someone at the mall, park, or at a basketball game as well as more formal activities like going out to eat or to a movie together." Those who answered with "yes" were then asked "During the past 3 months, how many times did you do each of the following things to someone you were dating or on a date with? Don't count it if you did it in self-defense or play." Two examples of the six items that followed were: "pushed, grabbed, shoved, or kicked them," and "beat them up." Response categories ranged from 0 (none) to 4 (ten times or more) in the past 3 months. Item responses were averaged to create the physical DV perpetration measure at each wave (average $\alpha=.95$). Non-daters were coded as 0.

Adolescents were also asked "During the past 3 months, how many times have you done each of the following things to someone about the same age as you that you were not dating?" The list of violent acts and response options paralleled the DV perpetration measure. Items were averaged to create the physical PV perpetration measure at each wave (average $\alpha=.91$).

Developmental outcomes—Developmental outcome measures are described in Table 1. All outcomes were based on self-report except for the peer-related outcomes, which were created through social network analyses. At each wave, students were given a Student Directory that listed all enrolled students along with an identification number for each student. Adolescents identified up to five close friends, starting with their best friend. Nomination data were used to create the *number of reciprocated friendships* and *social status* variables as described in Table 1.

Analytic strategy

Data were reorganized to take advantage of the cohort sequential design such that grade-level was used as the primary metric of time, rather than assessment wave. This, along with use of the full information maximum likelihood estimator, allowed for trajectories of each of the proposed outcomes to be continuously modeled across grades 8–12. Grade was centered in the spring of 8th grade so that the intercept represented average levels of the outcome variable at that time.

Generalized linear mixed (GLM) models were used to examine the prospective lagged effects of DV and PV perpetration on each targeted outcome (e.g., the effect of fall semester grade 8 PV perpetration on spring semester grade 8 internalizing symptoms). Analyses were conducted using Proc Glimmix with empirical standard errors in SAS version 9.3 [32]. Log

and logit link functions were used for count and binary outcomes, respectively. A random intercept accounted for the non-independence of repeated measures. Parameter estimates were not adjusted for school nesting because intra-class correlations on all outcomes were negligible. For each outcome, a full model was tested first including indicators of time (grade and grade-squared), DV and PV perpetration, sex (coded as 0 for female and 1 for male), DV and PV victimization, time invariant demographic control variables (race/ethnicity, single parent household, parent education) and all interactions between each type of perpetration and sex and each type of perpetration and the indicator(s) of time. We controlled for victimization, using measures parallel to the perpetration measures, in order to distinguish outcomes of perpetrating violence from those of being a victim of violence since perpetrators are also often victims of violence [33]. A backwards elimination procedure was used to trim non-significant interactions. Post hoc analyses were conducted for significant interactions to determine the nature of the interactions.

Multiple imputation procedures in SAS version 9.3 (Proc MI and Proc MIANALYZE) [32] were used to deal with missing data. The amount of data missing on each variable ranged from 4% for race/ethnicity to 28% for parent education.

Results

Correlations between DV and PV perpetration were .42, .55, .53, and .40 across the four waves, respectively. Table 2 presents the prevalence and mean amount of DV and PV perpetrated in the previous 3 months, by sex and grade. Girls were significantly more likely than boys to endorse any past 3-month DV perpetration in all semesters except spring semester of the 10th grade, when there were no sex differences. Girls reported perpetrating significantly more DV than boys in earlier semesters (except spring 8th grade), but there were no significant sex differences in the amount of DV perpetrated in later semesters (spring 10th grade to fall 12th grade).

Girls were also significantly more likely than boys to endorse any past 3-month PV perpetration in earlier semesters (except for spring 8th grade when there were no sex differences), but boys were significantly more likely than girls to report any PV perpetration in later semesters (fall 11th grade and spring 12th grade). There were no sex differences in the amount of PV perpetration in earlier grades, but in later grades (fall 11th grade and fall 12th grade), boys reported perpetrating significantly more PV than girls.

Outcomes of DV and PV Perpetration

Table 3 presents the results from the GLM models. As hypothesized and as predicted by multifinality, the level of DV perpetration in one semester significantly predicted multiple detrimental outcomes in the following semester including lower college aspirations, increased family conflict, and greater likelihood of marijuana use. The lagged effect of DV perpetration on family conflict, however, was moderated by grade in school (p<.001), such that the effect decreased in magnitude across grades: a one SD increase in DV perpetration in fall of 8th grade was significantly (p=.001) associated with 1.51 times more family conflict in spring of 8th grade, but the effects were no longer significant for lags beginning with DV perpetration in fall 10th grade. Counter to what was hypothesized, DV perpetration

did not predict more internalizing symptoms, loss of reciprocated friendships, lower GPA, or increased alcohol or cigarette use, and it did not predict increased social status.

As hypothesized, PV perpetration in one semester also significantly predicted multiple detrimental outcomes in the following semester, including more internalizing symptoms, lower college aspirations, increased alcohol intensity, and a greater likelihood of cigarette and marijuana use. The lagged associations between PV perpetration and internalizing symptoms, college aspirations, and alcohol intensity, however, decreased in significance across grades. A one SD increase in PV perpetration in fall of 8th grade was associated with a .33 increase on the 5-point internalizing scale in spring of 8th grade (p=.04); the effects were no longer significant beginning with the lag from fall of 10th grade to spring of 10th grade. A one SD increase in PV perpetration in fall of 8th grade was associated with a reduction in having college aspirations in spring of 8th grade (AOR=.29; p<.001); the effects were no longer significant beginning with the lag from spring of 10th grade to fall of 11th grade. For each SD unit increase in PV perpetration in fall of 8th grade, there was an increase of 5.26 units on the alcohol intensity scale, which ranged from 0 to 25 (p<.001); the effects beginning with the lag from spring of 10th grade to fall of 11th grade were no longer significant. Counter to what was hypothesized, PV perpetration did not predict loss of reciprocated friendships, lower GPA, or increased family conflict and it did not predict increased social status.

Discussion

Perpetrating DV and PV predicted multiple detrimental outcomes for adolescent boys and girls across grades 8 to 12, although in some cases, for earlier grades only. The findings demonstrate, as predicted by multifinality, diversity of outcomes from a single adverse event, and that if a single outcome had been examined, the impact of perpetrating violence would have been underestimated. The robustness of the findings is suggested by the fact that prospective effects of each type of violence were significant after accounting for the effects of the other type of violence, DV and PV victimization, and demographic characteristics that could have potentially confounded associations.

Although both types of perpetration predicted multiple adverse outcomes, PV perpetration predicted a greater variety of negative outcomes (i.e. more internalizing symptoms, lower college aspirations, greater alcohol intensity, and greater likelihood of cigarette and marijuana use) than did DV perpetration (i.e. lower college aspirations, greater family conflict, and greater likelihood of marijuana use). Perhaps this is because, in general, there was more PV than DV perpetrated by the adolescents. It is also possible that PV perpetrators, more so than DV perpetrators, joined deviant peer groups that then supported more detrimental outcomes, such as involvement in more substances. Additionally, potential outcomes specific to DV perpetration, such as the impact on the dating relationship and the ability to get and maintain dating partners, and outcomes of DV perpetration found in other studies such as suicide ideation [5] and social information processing [7] were not measured. Why some outcomes were unique to perpetration type is not clear; DV, but not PV perpetration, predicted increases in family conflict, whereas PV, but not DV perpetration, predicted more internalizing symptoms. However, these differences occurred only in earlier

grades. Future longitudinal studies are needed to examine developmental, cognitive, social, and contextual factors that explain why consequences vary by perpetration type.

The lagged effect of perpetration on some outcomes diminished across grades. This was the case for the effect of PV perpetration on internalizing symptoms, college aspirations, and alcohol intensity, and of DV perpetration on family conflict. One possible explanation for these findings is that, in general, the amount of DV and PV perpetrated was higher in earlier than later grades, which may have produced more detrimental outcomes in earlier grades. Also, the impact of perpetration may be greater at earlier than later grades because it occurred at a time period marked by substantial social and developmental changes that pose additional challenges to adolescent coping. It is also possible that the omission of school dropouts, which is a limitation of school-based studies such as this one, many of whom may perpetrate violence, masked detrimental outcomes of perpetration at later grades. Additional research is needed that examines *if, how* and *why* outcomes of violence change across adolescence.

Neither type of perpetration predicted GPA or the peer variables. Detrimental effects of perpetration on academic performance may take longer than the three months between our lagged periods to realize. Although numerous studies have found associations between aggression and peer relationships, most were cross-sectional, precluding assessment of temporality in relationships, or assessed peer relationships as predictors rather than consequences of perpetration [22]. The studies finding that PV perpetration during adolescence predicted likability and popularity were conducted with younger samples (ages 10 – 14) than ours (ages 14 to 18) [17,18], which may have partially accounted for the inconsistency in our and their findings.

Most studies examining outcomes of violence *victimization* found a greater number of negative consequences for girls than boys [1,4]. We found no sex differences in the outcomes of *perpetration*, findings that are consistent with the few studies that examined sex differences in the outcomes of DV and PV on perpetrators. Johnson et al. [6] found that DV perpetration predicted depression for both boys and girls. Calvete et al. [7] found that it predicted changes in several indicators of social information processing similarly for boys and girls, with the exception that for boys, but not girls, it predicted anticipation of positive consequences from using DV, an outcome not measured in our study. Effects of PV perpetration on substance use [16], decreased likability [17], and increased popularity [17,18] were found for both boys and girls. Sex differences in outcomes of *victimization* have commonly been attributed to greater physical strength and power of males than females, and greater primacy given by females than males to having successful relationships and connection [6]. Perhaps these factors are less relevant when considering perpetration.

A study weakness is the inability to determine whether the perpetration *caused* the outcomes. Although longitudinal compared to cross-sectional designs better control for timing of events, they cannot account for all possible confounders, limiting claims of causation. Also, the primarily rural sample limits the ability to generalize study findings to the national population of adolescents. It is possible that the consequences of violence may vary depending on the geographic area in which adolescents live. For example, the

prevalence and visibility of violence in their geographic setting could alter perceptions of the acceptability of violence, and thus affect outcomes. Other limitations are that PV perpetration could have included reports of violence against siblings, and boys, more so than girls, may have underreported DV perpetration due to social desirability, although findings have been inconsistent on whether there are sex differences in this tendency [34]. Finally, although the prevalences of DV and PV in the study were relatively high, the amount of perpetration was low, precluding ability to examine outcomes of high levels of violence perpetration.

Despite these limitations, our findings inform violence prevention efforts, clinical interactions and estimates of societal burden. The detrimental effects we found on perpetrators provide additional justification, beyond the noted detrimental effects of violence on victims and their families [1–5], for the need to implement evidenced-based violence prevention programs; the high percentage of girl perpetrators reinforce the need for including them in violence prevention efforts. Several programs have demonstrated effectiveness in preventing *both* DV and PV perpetration and therefore efficiencies can be gained through their implementation [35]. The findings also inform development of new violence prevention programs. A common component of many violence prevention programs is a description of the negative impact of violence on victims in order to increase empathy and reduce perpetration, and to motivate victims to leave violent dating relationships. Our findings suggest that violence prevention programs should convey that using violence harms not only the victim, but the perpetrator as well, in ways that interfere with life accomplishments. Studies have found that adolescent aggressors who have concomitant risks, such as those examined in this study (e.g. poor mental health, substance use), have worse adult trajectories than aggressors without concomitant risks [10]. Thus, clinicians need to screen adolescent boy and girl patients suspected of being violent or aggressive for the identified outcomes so that those outcomes can be addressed and dialogue around stopping perpetration can begin. Additionally, clinicians may want to consider implementing evidenced-based violence prevention programs that were designed specifically for implementation in clinical settings (e.g. SafERteens) [36]. Finally, although the enormous societal burden of some types of antisocial behavior during childhood or adolescence has been estimated [37], to our knowledge, the societal cost of adolescent physical DV and PV perpetration has not been calculated. Such future endeavors should incorporate costs of the predicted outcomes identified in this study (i.e. internalizing symptoms, having family conflict and low college aspirations, and using alcohol, cigarettes, and marijuana) in those calculations. More nuanced studies are needed to determine if outcomes vary depending on the chronicity of the violence, the age that violence began, the number of peers victimized, and whether the perpetrator was or was not also a victim.

Acknowledgments

References

1. Moore SE, Norman RE, Sly PD, et al. Adolescent peer aggression and its association with mental health and substance use in an Australian cohort. J Adolesc. 2014; 37(1):11–21. DOI: 10.1016/j.adolescence.2013.10.006 [PubMed: 24331300]

2. Begle AM, Hanson RF, Danielson CK, et al. Longitudinal pathways of victimization, substance use, and delinquency: Findings from the National Survey of Adolescents. Addict Behav. 2011; 36(7):682–689. DOI: 10.1016/j.addbeh.2010.12.026 [PubMed: 21377805]

3. Exner-Cortens D, Eckenrode J, Rothman E. Longitudinal associations between teen dating violence victimization and adverse health outcomes. Pediatrics. 2013; 71:71–78. DOI: 10.1542/peds. 2012-1029 [PubMed: 23230075]

4. Foshee VA, Reyes HLM, Gottfredson NC, et al. A longitudinal examination of psychological, behavioral, academic, and relationship consequences of dating abuse victimization among a primarily rural sample of adolescents. J Adolesc Health. 2013; 53(6):723–9. DOI: 10.1016/j.jadohealth.2013.06.016 [PubMed: 23910572]

5. Nahapetyan L, Orpinas P, Song X, Holland K. Longitudinal association of suicidal ideation and physical dating violence among high school students. J Youth Adolesc. 2014; 43(4):629–640. DOI: 10.1007/s10964-013-0006-6 [PubMed: 23996215]

6. Johnson WL, Giordano PC, Longmore MA, Manning WD. Intimate partner violence and depressive symptoms during adolescence and young adulthood. J Health Soc Behav. 2014; 55(1):39–55. DOI: 10.1177/0022146513520430 [PubMed: 24578395]

7. Calvete E, Orue I, Gamez-Guadix M, de Arroyabe EL. Social Information Processing in Dating Conflicts Reciprocal Relationships with Dating Aggression in a One-Year Prospective Study. J Interpers Violence. 2014; :1–25. DOI: 10.1177/0886260514564160

8. Prinstein MJ, La Greca AM. Childhood peer rejection and aggression as predictors of adolescent girls' externalizing and health risk behaviors: a 6-year longitudinal study. J Consult Clin Psychol. 2004; 72(1):103–112. DOI: 10.1037/0022-006X.72.1.103 [PubMed: 14756619]

9. Farrington DP, Ttofi MM. Bullying as a predictor of offending, violence and later life outcomes. Crim Behav Ment Health. 2011; 21(2):90–98. DOI: 10.1002/cbm.801 [PubMed: 21370294]

10. Sourander A, Jensen P, Ronning JA, et al. Childhood bullies and victims and their risk of criminality in late adolescence: the Finnish "From a Boy to a Man" study. Arch Pediatr Adolesc Med. 2007; 161(6):546–552. DOI: 10.1001/archpedi.161.6.546 [PubMed: 17548758]

11. Niemela S, Brunstein-Klomek A, Sillanmaki L, et al. Childhood bullying behaviors at age eight and substance use at age 18 among males. A nationwide prospective study. Addict Behav. 2011; 36:256–260. DOI: 10.1016/j.addbeh.2010.10.012 [PubMed: 21146319]

12. Ttofi MM, Farrington DP, Losel F, Loeber R. The predictive efficiency of school bullying versus later offending: A systematic/meta-analytic review of longitudinal studies. Crim Behav Ment Health. 2011; 21(2):80–89. DOI: 10.1002/cbm.808 [PubMed: 21370293]

13. Dobkin PL, Tremblay RE, Mâsse LC, Vitaro F. Individual and peer characteristics in predicting boys' early onset of substance abuse: a seven-year longitudinal study. Child Dev. 1995; 66(4):1198–1214. DOI: 10.2307/1131807 [PubMed: 7671656]

14. Brook JS, Whiteman MM, Finch S. Childhood aggression, adolescent delinquency, and drug use: A longitudinal study. J Genet Psychol. 1992; 153(4):369–383. DOI: 10.1080/00221325.1992.10753733 [PubMed: 1295953]

15. Brook JS, Newcomb MD. Childhood aggression and unconventionality: Impact on later academic achievement, drug use, and workforce involvement. J Genet Psychol. 1995; 156(4):393–410. DOI: 10.1080/00221325.1995.9914832 [PubMed: 8543928]

16. Espelage DL, Low S, Rao MA, et al. Family violence, bullying, fighting, and substance use among adolescents: A longitudinal mediational model. J Res Adolesc. 2014; 24(2):337–349. DOI: 10.1111/jora.12060

17. Cillessen AH, Mayeux L. From censure to reinforcement: Developmental changes in the association between aggression and social status. Child Dev. 2004; 75(1):147–163. DOI: 10.1111/j.1467-8624.2004.00660.x [PubMed: 15015681]

18. Ojanen T, Findley-Van Nostrand D. Social goals, aggression, peer preference, and popularity: Longitudinal links during middle school. Dev Psychol. 2014; 50(8):2134– 2143. DOI: 10.1037/a0037137 [PubMed: 24911564]

19. Cicchetti D, Rogosch FA. Equifinality and multifinality in developmental psychology. Dev Psychopathol. 1996; 8:597– 600. DOI: 10.1017/S0954579400007318

20. Kretschmer T, Barker ED, Dijkstra JK, et al. Multifinality of peer victimization: maladjustment patterns and transitions from early to mid-adolescence. Eur Child Adolesc Psychiatry. 2015; 24(10):1169– 1179. DOI: 10.1007/s00787-014-0667-z [PubMed: 25540123]

21. Brumbach BH, Figueredo AJ, Ellis BJ. Effects of harsh and unpredictable environments in adolescence on development of life history strategies: a longitudinal test of an evolutionary model. Hum Nat. 2009; 20(1):25–51. DOI: 10.1007/s12110-009-9059-3 [PubMed: 20634914]

22. Salmivalli C. Bullying and the peer group: A review. Aggress Violent Behav. 2010; 15(2):112–120. DOI: 10.1016/j.avb.2009.08.007

23. Foshee, VA.; Reyes, HLM. Dating Abuse: prevalence, consequences, and predictors. In: Levesque, RJR., editor. Encyclopedia of Adolescence. New York, NY: Springer Publishers; 2011. p. 602-615.

24. Graves KN. Not always sugar and spice: Expanding theoretical and functional explanations for why females aggress. Aggress Violent Behav. 2007; 12(2):131–140. DOI: 10.1016/j.avb.2004.08.002

25. Faris R, Felmlee D. Status struggles: Network centrality and gender segregation in same- and cross-gender aggression. Am Sociol Rev. 2011; 76(1):48–73. DOI: 10.1177/0003122410396196

26. Hawley PH. The ontogenesis of social dominance: A strategy-based evolutionary perspective. Dev Rev. 1999; 19(1):97–132. DOI: 10.1006/drev.1998.0470

27. Foshee VA. Gender differences in adolescent dating abuse prevalence, types, and injuries. Health Educ Res. 1996; 11(3):275–286. DOI: 10.1093/her/11.3.275-a

28. Reynolds CR, Richmond BO. Factor structure and construct validity of "What I Think and Feel": The Revised Children's Manifest Anxiety Scale. J Pers Assess. 1979; 43(3):281–283. DOI: 10.1207/s15327752jpa4303_9 [PubMed: 469706]

29. Angold A, Costello EJ, Messer SC. Development of a short questionnaire for use in epidemiological studies of depression in children and adolescents. Int J Methods Psychiatr Res. 1995; 5:237–249.

30. Freeman LC. A set of measures of centrality based on betweenness. Sociometry. 1977; 40(1):35–41. DOI: 10.2307/3033543

31. Bloom BL. A factor analysis of self-report measures of family functioning. Fam Process. 1985; 24(2):225–239. DOI: 10.1111/j.1545-5300.1985.00225.x [PubMed: 4018243]

32. SAS [statistical software], Version 9.3. Cary, NC: SAS Institute Inc; 2012.

33. Chiodo D, Crooks CV, Wolfe DA, et al. Longitudinal prediction and concurrent functioning of adolescent girls demonstrating various profiles of dating violence and victimization. Prev Sci. 2012; 13(4):350–359. DOI: 10.1007/s11121-011-0236-3 [PubMed: 21769657]

34. Follingstad DR, Rogers MJ. Validity concerns in the measurement of women's and men's report of intimate partner violence. Sex Roles. 2013; 69(3):149–167. DOI: 10.1007/s11199-013-0264-5

35. Foshee VA, Reyes HLM, Agnew-Brune CB, et al. The effects of the evidence-based Safe Dates dating abuse prevention program on other youth violence outcomes. Prev Sci. 2014; 15:907–916. DOI: 10.1007/s11121-014-0472-4 [PubMed: 24599482]

36. Cunningham RM, Chermack ST, Shope JT, et al. Effects of a brief intervention for reducing violence and alcohol misuse among adolescents: A randomized trial. J AM Med Assoc. 2010; 304(5):527–535. DOI: 10.1001/jama.2010.1066

37. Scott S, Knapp M, Henderson J, Maughan B. Financial cost of social exclusion: follow up study of antisocial children in adulthood. Brit Med J. 2001; 323:191– 194. http://dx.doi.org/10.1136/bmj.323.7306.191. [PubMed: 11473907]

Implications and Contributions

This longitudinal study found that perpetrating violence against dates and peers predicted detrimental consequences for adolescents, including increased internalizing symptoms, family conflict, alcohol, cigarette and marijuana use, and decreased college aspirations; these need to be considered in clinical interactions with adolescents and violence prevention programming.

Table 1

Measurement for developmental outcomes.

Variable	Number of items	Item or example item	Response categories	Variable creation	Average alpha
Internalizing Symptoms				Summed and averaged items from an anxiety [28] and depression [29] scale.	.92
Anxiety [28]	7	In the past 3 months "I worried about what was going to happen"	0 = strongly disagree to 4 = strongly agree		
Depression [29]	3	In the past 3 months "I hated myself"	0 = strongly disagree to 4 = strongly agree		
Number of reciprocated friendships				Social network analyses were used to determine the number of nominated friends who also nominated the adolescent as a friend.	
Social status (betweeness centrality) [30]				Social network analyses were used to first determine the shortest paths, or geodesics, between all pairs of students, based on friendship nominations linking adolescents directly and indirectly, and then calculating the percentage of all these geodesics that included the focal adolescent. This variable was coded such that higher values reflected greater centrality, or social status.	
College aspirations	1	"How important or unimportant is going to college to you?"	0 = not at all important to 3 = very important	Dichotomized as 0 for not at all important and 1 for otherwise	
Grade point average (GPA)	4	Self-reported grades of the most recent grading period in English/Language arts, Mathematics, History/Social studies, and Science.	1 (D or lower) to 4 (A)	Averaged grades to create a GPA score	
Family conflict [31]	3	In the past 3 months "We fight a lot in our family."	0 = strongly disagree to 4 = strongly agree	Summed and averaged items	.87
Alcohol intensity	2	"During the past 3 months about how many days did you have 1 or more drinks of alcohol?" "About how much did you usually have when you drank in the past 3 months?"	0 = no days to 5 = 20 or more days. 0 = less than 1 drink to 5 = 5 or more drinks	Multiplied responses to the frequency and quantity questions.	
Cigarette use	1	Number of days over the past 3 months they smoked cigarettes.	0 = days to 5= 20 days or more	Dichotomized as 1 for use and 0 for no use in the past 3 months	
Marijuana use	1	Number of times over the past 3 months they used marijuana.	0 = no times to 4 = 10 times or more	Dichotomized as 1 for use and 0 for no use in the past 3 months	

Table 2

Endorsement percentage and mean amount of past-three month physical DV and PV perpetration across grades 8 through 12, by sex.

	Physical DV Perpetration				Physical PV Perpetration			
	Endorsement % (N)		Mean (SD)		Endorsement % (N)		Mean (SD)	
	Female	Male	Female	Male	Female	Male	Female	Male
Fall 8th Grade	24 (107)	6 (22) *	.21 (.64)	.09 (.46) *	36 (149)	31 (111) *	.26 (.58)	.24 (.59)
Spring 8th Grade	20 (81)	9 (31) *	.19 (.59)	.23 (.86)	36 (142)	31 (97)	.26 (.54)	.31 (.80)
Fall 9th Grade	24 (200)	8 (57) *	.21 (.61)	.12 (.57) *	34 (265)	27 (174) *	.25 (.55)	.27 (.71)
Spring 9th Grade	25 (104)	9 (33) *	.25 (.72)	.16 (.69) *	29 (119)	23 (78) *	.23 (.55)	.24 (.76)
Fall 10th Grade	27 (294)	7 (69) *	.21 (.58)	.11 (.57) *	28 (300)	24 (211)	.20 (.49)	.24 (.66)
Spring 10th Grade	29 (107)	12 (38)	.24 (.67)	.24 (.86)	29 (105)	25 (72)	.23 (.61)	.29 (.79)
Fall 11th Grade	23 (164)	7 (41) *	.17 (.55)	.12 (.61)	19 (129)	21 (111) *	.13 (.41)	.24 (.70) *
Fall 12th Grade	22 (62)	8 (19) *	.16 (.53)	.08 (.37)	14 (38)	18 (40) *	.08 (.35)	.20 (.59) *

Note.

*
Sex difference is significant at *p*<.05.

Table 3

Parameter estimates and standard errors (in parentheses) for the lagged (prospective) effects of DV and PV perpetration at one time point on developmental outcomes at the next time point

	Internalizing Symptoms	Reciprocated Friendships	Social Status	College Aspirations	GPA	Family Conflict	Alcohol Intensity	Cigarette Use	Marijuana Use
Intercept	2.10*** (.13)	0.78*** (.10)	16.19*** (1.28)	0.36 (.19)	2.49*** (.09)	0.50*** (.10)	−0.28 (1.45)	−0.36 (.22)	−1.31*** (.22)
Grade	−0.01 (.02)	−0.01 (.02)	−5.16*** (.43)	−0.13*** (.03)	0.01 (.02)	−0.02 (.02)	0.90*** (.24)	0.00 (.04)	0.04 (.04)
Grade * Grade	-	-	0.44*** (.04)	-	-	-	-	-	-
Male	−0.31*** (.04)	−0.22*** (.02)	−0.09* (.04)	−0.70*** (.04)	−0.15*** (.03)	0.01 (.02)	2.33*** (.34)	0.02 (.06)	0.30*** (.06)
Dating Violence (DV)	0.02 (.04)	−0.01 (.03)	0.05 (.05)	−0.26*** (.07)	0.05 (.03)	0.49*** (.13)	0.19 (.44)	0.14 (.08)	0.21** (.07)
DV Grade	-	-	-	-	-	−0.08*** (.02)	-	-	-
Peer Violence (PV)	0.47* (.20)	0.00 (.03)	−0.05 (.05)	−0.95** (.36)	−0.01 (.03)	0.02 (.03)	5.85* (2.38)	0.17* (.07)	0.25** (.07)
PV Grade	−0.07* (.03)	-	-	0.12* (.06)	-	-	−0.86* (.38)	-	-

*
p<.05;

**
p<.01;

***
p<.001

Note. parameter estimates are in logit scale for: college aspirations, cigarette use, and marijuana use. Parameter estimates are in log scale for: reciprocated friendships, social status, and family conflict. GPA is grade point average.

All models controlled *for race/ethnicity, single parent household, parent education, DV victimization and PV victimization.*