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Trajectories of Dating Violence Victimization and Perpetration among Rural Adolescents

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Abstract

Research is inconclusive about the trajectory of dating violence during adolescence and whether there are differences across gender and race/ethnicity. We examined dating victimization and perpetration trajectories among a diverse sample of rural youth ($N = 580$, 52.7% female, 49% Black, 39% White, 11% Hispanic or other minorities) in middle and high school who were surveyed annually across four years and explored the influences of gender and ethnicity. The results based on cohort-sequential latent growth modeling revealed that for boys, victimization peaked at 11th grade, and then declined. For girls, victimization was stable throughout adolescence. Perpetration was reported less frequently and increased steadily for males and females. For White youth, victimization peaked at grades 9 and 10, followed by a decline. For Black youth, victimization followed a linear increase. Perpetration trajectory followed a linear increase for White and Black but not Hispanic youth. The findings indicate that the developmental progression of dating violence during adolescence varies by demographics. The discussion focuses on future directions for research on teen dating violence among rural youth and implications for prevention and interventions initiatives.

Keywords Adolescent dating violence · Rural youth · Victimization and perpetration trajectories · Cohort-sequential design

Introduction

Different forms of dating violence, including physical, sexual, and psychological forms, are widespread among adolescents in the United States. The most recent data from the Youth Risk Behavior Surveillance survey indicate that among high school students who were dating or went out with someone during the 12 months before the survey, 9.1% experienced physical dating violence and 7.4% had been forced to have sexual intercourse against their will (Kann et al. 2018). In a recent meta-analytic review of the

prevalence of dating violence among a wider age-range of teens (aged 13 to 18), Wincentak et al. (2017) reported an overall prevalence of 20% for physical dating violence and 9% for sexual dating violence. Rates of psychological dating violence typically are higher, with as many as half of adolescents reporting some form of psychological abuse at some point in their dating relationships (Zweig et al. 2013).

Although national estimates of the prevalence of adolescent dating violence reveal the pervasiveness of the problem, they do not provide a nuanced and comprehensive understanding of this phenomenon. To date, too few descriptions of dating victimization and perpetration have focused on trajectories delineated by gender, or race/ethnicity. Similarly, often speculated upon but seldom studied is dating violence among adolescents in rural communities. Additionally, although research on teen dating violence has grown in complexity, many findings from empirical and theoretical inquiries have provided conflicting descriptions. It is essential to begin addressing these issues so that we can better identify youth at risk and inform prevention and intervention efforts accordingly. The current study aims to extend the literature on dating violence among rural adolescents by describing the trajectories of dating victimization and perpetration from early to late-adolescence

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(corresponding to students in grades 6 through 12) and examining the influence of gender and ethnicity.

Trajectories of Adolescent Dating Violence

One area in the teen dating violence literature where there is contradictory evidence pertains to variation in the prevalence of dating violence over time (Nocentini et al. 2010). Some research has revealed a linear downward trend in dating violence among adolescents. As adolescents get older, there is a decline in rates of dating violence victimization and perpetration (Wolfe et al. 2003). On the other hand, some research indicates a nonlinear trend in dating violence among adolescents. For example, several studies showed that an initial increase in dating violence in early to mid-adolescence is followed by a decline in late adolescence and young adulthood (Copp and Johnson 2015; Giordano et al. 2015). Yet other researchers found that psychological dating abuse increases linearly throughout adolescence (Foshee et al. 2009).

Furthermore, in the literature on age-related changes in dating violence, researchers have found different ages during which the risk of getting involved in a violent romantic relationship is especially elevated. For example, in their study of 13- to 19-year-olds in North Carolina, Foshee et al. (2009) found that 16 to 17 years was the peak age for dating violence perpetration. This finding was replicated and extended with a sample of adolescents from Spain by Fernandez-Gonzalez et al. (2014) who found that adolescents between ages 16 to 17 were the most vulnerable to both dating violence perpetration and victimization. Other researchers also claimed that the best shape to represent development of adolescent dating violence over time is that of a curve, though with a different peaking point at the age of 20 (Copp and Johnson 2015). Giordano et al. (2015) further provided evidence that violence peaks in late adolescence and declines slowly in early adulthood.

In contrast, other researchers found that the overall dating violence trajectory follows a linear decline from mid- to late adolescence. For example, in a study with high-risk youth who participated in a community-based intervention, Wolfe et al. (2003) found a decline in both physical and emotional dating violence perpetration and victimization rates among youth from ages 14–16 to 16–18. Similarly, Nocentini et al. (2010), in their study of 16- to 18-year-olds in Italy, established an overall decrease in physical dating victimization and perpetration across the ages studied.

Variation in the prevalence of dating violence among adolescents of different ages suggests that developmental factors play an important role in understanding when adolescents are the most vulnerable to dating abuse (Foshee et al. 2009). Despite longstanding theoretical support for developmental considerations of various adolescent outcomes, empirical inquiries are only beginning to offer insight into the progression of dating aggression between adolescent couples from a developmental perspective (Leadbeater et al. 2018). One of the reasons for this research gap is a lack of explicit consideration of developmental literature in studies of dating violence trajectories among adolescents. Indeed, researchers have lamented the disconnect between dating violence scholarship and the literature on normative adolescent development for some time (Exner-Cortens 2014). In a similar vein, researchers examining contextual influences on adolescent violence across time, including geographic and socio-economic factors, have largely ignored the literature on adolescent development (Robinson and Ryder 2014).

Notwithstanding a dearth of scholarship explicitly linking violence victimization and perpetration trajectories with psychosocial development of adolescents, much can be gleaned from related literatures to begin investigating the intersection of developmental changes and dating violence. In a review of theories of adolescent development relevant to adolescent romantic relationships, Exner-Cortens (2014) focused specifically on teen dating victimization and identified several developmental processes that can explain variability in the progression of dating violence. For example, Erikson's theory of interpersonal identity posits that exploration of relational identity increases with age and might be more salient for girls.

Emotional intelligence, both as a mental ability and a personality trait, develops rapidly during adolescence and is a factor of interest in linking dating violence with development. In a recent longitudinal study of the role of emotional intelligence in the maintenance of adolescent dating violence perpetration, Fernández-González et al. (2018) established that various aspects of emotional intelligence among adolescents influenced dating violence perpetration over time. The authors demonstrated that variation across various aspects of emotional intelligence can serve either as a risk or a protective factor in repeated perpetration of dating violence. Specifically, it was found that adolescent with higher scores on emotional clarity, a specific aspect of emotional intelligence, had a lower likelihood of perpetrating dating violence, after controlling for previous perpetration of dating violence, in comparison with adolescents who reported lower emotional clarity. Importantly, a gender effect was also found. Thus, attention to emotions, another component of emotional intelligence, was found to be protective against further dating violence perpetration specifically among adolescent girls. For boys, higher levels of emotional regulation, known as the repair aspect of emotional intelligence, was associated with a lower likelihood of perpetuating dating violence. The authors concluded that initiatives aimed at fostering emotional intelligence among adolescents can be an effective way to prevent the

perpetuation of dating aggression. However, because the study was limited to one year and included older adolescents (18-year-olds, approximately), it is not yet known how changes in emotional intelligence across a wider age span might intersect with dating violence victimization and perpetration trajectories.

Dating Violence Trajectories by Demographic Characteristics

Within the literature on age-related changes in adolescent dating violence, few studies explored these changes in the context of demographic characteristics. Similar to differences in the proposed trajectories of dating violence, findings related to the influence of demographic factors have been inconclusive. In terms of gender, some researchers found declines in various forms of dating abuse, and these were steeper among girls than boys (Wolfe et al. 2003; Nocentini et al. 2010). By contrast, Foshee et al. (2009) found that developmental trajectories for different types of dating violence perpetration were the same for males and females. Furthermore, in describing longitudinal patterns of violence perpetration among adolescents, Giordano et al. (2015) pointed out that although a negative quadratic slope is the best representation of the perpetration trajectory for both females and males, for women, the highest peak was observed at a later age in comparison with men.

Findings on the associations between ethnicity and dating violence trajectories reveal a mixed picture as well. For example, Foshee et al. (2009) found that although minority youth reported more perpetration at all ages (13 through 19) compared to White youth, minority status did not influence the trajectories of any type of dating violence perpetration. In a study of trajectories of dating aggression among a diverse groups of teens in grades 6 through 12, Orpinas et al. (2013) found that Black and Hispanic students were more likely to belong to groups with either high or increasing prevalence of physical dating victimization or perpetration. Further, in a longitudinal study of factors contributing to dating aggression, Connolly et al. (2010) found that minority status interacted with risk factors in such a way that the presence of certain risk factors as well as their accumulation predicted the risk for dating aggression more strongly among youth from ethnic minority groups than among majority youth.

More generally, cross-sectional studies found higher rates of self-reported dating violence among African American, Native American, and Hispanic youth than White youth (Eaton and Stephens 2018; Foshee et al. 2010). A study that explored race differences in predictors of dating violence established that race modifies the influence of risk factors on the likelihood of experiencing dating aggression (Foshee et al. 2010). Specifically, anxiety was found to increase the risk for perpetration among White but not Black youth and anger was associated with dating violence perpetration by Black but not White students. Similarly, variation in the prevalence rates of dating violence between boys and girls has been a focus of numerous cross-sectional studies, with findings ranging from similar rates of violence between genders (Rothman and Xuan 2014) to higher rates for perpetration and victimization among girls (Ybarra et al. 2016) and higher rates for sexual violence perpetration among boys (Shorey et al. 2017).

Summary

To date, there are both common themes and competing explanations on trajectories of dating violence. Researchers agree that mid-adolescence to early adult years are the period during which many adolescents are at risk for experiencing violence in a dating relationship though the nature of the trajectory is in dispute ranging from U-shaped curves, including inverted shapes, to linear trends with either positive or negative slopes of various steepness levels. A starting point in explaining variation in dating violence trajectories is to consider methodological peculiarities, including variation in operational definitions of dating violence, study samples, frequency of data collection, analytic approaches and study design more generally. For instance, some researchers use a full range of aggressive events to define the continuum of a violent relationship, while others may focus on a specific type of relationship violence (e.g., physical victimization or sexual violence perpetration) or include time constraints, such as experience of violence in the last 12 months (Hokoda et al. 2012). In a recent comprehensive review of measures of dating violence, Exner-Cortens et al. (2016) documented a wide range in the prevalence of dating violence victimization and perpetration across studies with different measures.

In addition to measurement issues that might underlie differences in documented trajectories, sample-specific characteristics should be considered. Few studies of teen dating violence use representative samples and instead utilize convenience samples or select participants from various subgroups. For example, Exner-Cortens and colleagues (2016) found that over two thirds of studies they reviewed (76.5%) relied on non-representative samples. Finally, it is possible to suggest that variation in dating violence trajectories might be attributed to differences in research goals. For example, findings from evaluation of an intervention (e.g., Wolfe et al. 2003) might differ from those obtained in exploratory or explanatory research initiatives. As research findings from the field of adolescent dating violence accumulate, there likely will be greater consensus on effective theoretical developmental approaches and standard methodological procedures.

Dating Violence among Rural Youth

With few exceptions (Martz et al. 2016; McDonell et al. 2010), research on dating violence among rural youth is limited. Studies describing age-related differences in dating violence among youth in rural communities are even more scarce (c.f., Fernandez-Gonzalez et al. 2014). Of note, the few studies that focus on rural teen dating violence seldom account for the influence of the rural context per se (Robinson and Ryder 2014). Some research indicates that youth in rural communities experience higher rates of teen dating violence in comparison with the national average (Marquart et al. 2007). For example, Spencer and Bryant (2000) found that both girls and boys attending rural schools were nearly twice as likely to report dating violence victimization than their counterparts from schools in urban and suburban areas. By contrast, others documented disproportionately high rates of adolescent dating violence among racial and ethnic minority youth residing in urban and economically disadvantaged communities (Fedina et al. 2016). A recent survey of high school students in the US revealed that non-Hispanic black students in urban and suburban areas reported the highest proportion of physical dating violence victimization in the past 12 months (Kann et al. 2018). More generally, in reviewing the literature, Edwards (2015) found that victimization rates reported by youth in rural areas were similar to those reported by urban and suburban youth. Thus, it is important to acknowledge variation in the estimates of teen dating violence along the rural-urban continuum.

Dating violence victimization among rural youth is particularly concerning given certain characteristics of rural communities, such as geographic isolation, limited availability and access to counseling, medical, and other professional services in the community. For example, a 2012 national survey of victim providers revealed that rural agencies serve a smaller proportion of youth clients in comparison with similar agencies in urban areas (Break the Cycle 2014). Importantly, the difference was largest for youth ages 12 to 17. Further, the survey revealed discrepancies in the types of serves that are most available to youth in urban and rural areas. Specifically, while individual professional counseling was found to be the most available service to urban youth, for youth in rural communities, the most available service was assistance with protective or restraining orders. These factors can exacerbate detrimental consequences of dating violence for adolescents in those areas. Indeed, in a study with high school students from rural schools in the Appalachian region of North Carolina, Martz et al. (2016) not only found a link between physical and sexual violence and a number of health and behavioral risks, such as depression, suicidal ideation, and substance use, but also suggested that the nature of rural realities might interfere with adolescents' ability to cope with the aftermath of relationship aggression and that adolescents might choose to engage in risky behaviors as a coping mechanism.

Current Study

Using data from four waves of a cohort-sequential study of teen dating violence, the current study aimed to extend the research base of how adolescents' involvement in violent dating relationships changes over time while simultaneously advancing the literature on teen dating violence among an understudied population—those living in rural areas. Considering recent evidence on longitudinal patterns in teen dating violence, we hypothesized that the trajectory of teen dating violence would be non-linear. Given contradictory findings in the literature on age trends in teen dating aggression, no specific age points were identified with regard to developmental period during which changes in the trajectory would occur. Similarly, considering inconclusive results from research on the intersection of gender and race/ethnicity with dating violence trajectories, no specific hypotheses were formulated.

Methods

Participants and Procedure

This study is based on four annual waves of survey data from the Multi-level Cohort Sequential Study of Rural Adolescent Dating Violence Victimization and Perpetration. Participants were students in public schools of the same school district in a rural area in the southeastern United States. A population proportional to size sampling procedure was used to select study participants. Altogether, invitations were mailed to parents of 2508 students in grades six through nine, with 1296 responses (51.7% response rate), of which 642 responses (25.6%) indicated agreement to participate in the research project.

The study sample consisted of 580 6th–9th graders who were followed for four years. For most participants, each data collection period was about one year apart. Participants were linked to form an overall study sample spanning grades 6 through 12. On average, adolescents were 13 years old at Wave 1 ($SD = 1.48$) and slightly more than half of students were male (52.7%). African-Americans were the largest racial category of respondents (49%), followed by Caucasians (39%) and Hispanic or other minorities (11%). Over half of participants lived in two-parent households, with a family income below the median income for the county of $32,979.

The study and its procedures were approved by the Institutional Review Board at the study-affiliated university and by District School Board administrators. Trained data collectors administered paper-and-pencil surveys to participants, most of which were completed in participants' homes. Considering the sensitive nature of the survey, efforts were made to minimize contact between caregivers and youth during survey completion. The majority of caregivers and students filled out the survey privately (e.g., in different rooms or opposite sides of the same room). Prior to administering the survey, consent documents were collected from each participant. All data collectors were trained in mandated reporting and safety planning, and appropriate procedures were put in place to intervene with the respondent if warranted. Adolescents and caregivers received gift cards for their participation. Adolescent participants received a $10 gift card at Wave 1, a $15 gift card at Wave 2, a $20 card at Wave 3, and a $25 gift card at Wave 4. Caregiver participants received $15 during the first year, rising by $5 each year for four years. Only data from adolescent participants were used in this study.

Measures

Teen dating violence victimization

Teen dating violence victimization was measured by a composite measure of four single items constructed for the survey. The measure included physical, sexual, and psychological aspects of victimization. Items included: "Have you ever felt threatened, humiliated, or controlled by a dating partner?", "Have you ever been hit, slapped, kicked, or otherwise physically hurt by a dating partner?", "Have you ever been forced by a dating partner to touch him or her sexually when you didn't want to?" and "Have you ever been forced by a dating partner to have sexual intercourse when you didn't want to?" Dichotomous responses, 1 (yes) and 0 (no), were used to create a binary variable denoting dating victimization, consistent with previous research (e.g., Bell and Naugle 2007; Shorey et al. 2017). Adolescents received a value of 1 (experienced dating violence victimization) if they endorsed one or more victimization items and a value of 0 (did not experience dating violence victimization) if they answered no to all the victimization questions.

Teen dating violence perpetration

Teen dating violence perpetration was measured by a scale composed of four single items constructed for survey purposes. The measure included physical, sexual, and psychological aspects of perpetration. Sample items were: "Have you ever yelled at, humiliated, or threatened your

boyfriend or girlfriend in order to get him or her to do what you want?", "Have you ever hit, slapped, kicked, or otherwise physically hurt a dating partner?" and "Have you ever coerced or forced a dating partner to have sexual intercourse when he or she didn't want to?" Similar to the victimization measure, dichotomous responses, 1 (yes) and 0 (no), were used to create a binary variable denoting violence perpetration. Adolescents received a value of 1 (experienced dating violence perpetration) if they endorsed one or more perpetration items and a value of 0 (did not experience dating violence perpetration) if they answered no to all the perpetration questions.

Demographic variables

The questionnaire included a combination of statements and questions about demographic characteristics of participants. Gender of adolescent participants was included as a covariate (male = 1, female = 0), along with race/ethnicity (Caucasian = 0, African American = 1, Hispanic or other = 2). Of note, the survey included seven categories of race/ethnicity, which were later collapsed due to low counts of some ethnic/racial groups.

Attrition and Missing Values

Of the 2508 eligible students, parents of 642 (25.6%) students agreed to their child's participation on the study. Of those, 57 (8.8%) could not be reached or were not available to complete the survey. The sample size for the first wave consisted of 580 adolescents (23.1% of students in the district). During the second wave, 51 participants declined to participate or could not be reached, resulting in a sample size of 529 (8.7% attrition). Attrition increased slightly in waves 3 and 4 of the study, with 514 and 489 completing the survey in respective waves.

Of 585 students enrolled in the study, 489 remained in the study throughout its duration (84.3%). The proportion of boys and girls remained consistent in all waves of the study. Adolescents who participated in fewer than four waves were not significantly different from students completing all four waves on gender ($\chi^2 = 1.32$, $p = 0.25$). Dropout, however, was moderately associated with ethnicity ($\chi^2 = 5.58$, $p = 0.06$) with higher attrition rates among White, Hispanic, and other minority students (20%) than among Black students (12.2%). Students with fewer than four waves of data were included in the analyses.

In addition to attrition, there were 28 students for whom survey responses on the eight dating violence questions were incomplete in one or more wave. To mitigate possible bias by omitting these subjects from the analysis, we performed multiple imputation via chained equations with 10 imputed datasets. Six participants were omitted from the

analysis: five of these had no data available from Wave 1 and one student was 20 years old. In addition, several subjects reported different ethnicities at different waves of the study. For these subjects, the most frequently-reported value was used. R package mice was used to impute missing values using logistic regression (Buuren and Groothuis-Oudshoorn 2011). In the subsequent analysis of latent trajectories, estimates combined across imputed datasets are reported, following the procedures specified by Little and Rubin (2002).

Analytic Approach

Data analysis included descriptive and inferential statistics. First, a descriptive summary of the frequency of reported overall perpetration and victimization is presented followed by presentation of the association between experiences of violence and gender and ethnicity. Inferential analyses included a series of latent curve models that describe students' susceptibility to dating violence from grades 6–12. Informed by prior research that identified several challenges of using latent growth models to analyze low frequency data (e.g., Duncan et al. 2006; Johnson et al. 2015), we used binomial generalized linear mixed models (GLMM) to model the binary outcomes of experiences of dating violence. This model treats the logit of the probability of experiencing dating violence as a linear function of fixed predictors and accounts for correlation among students' repeated measurements. Inclusion of students' grade and squared grade as fixed effects produces a quadratic latent curve that describes the trajectory of the population-level probability of experiencing dating violence. Of note, the grade and squared grade terms produce linear and quadratic trends on the logit scale; however, they produce a quadratic-like peak on the probability scale. Due to numeric instability in the model coefficients, the polynomial effects were transformed to orthogonal polynomials. This transformation affects only the interpretation of coefficient values but does not change the underlying model for the trajectory.

To account for correlation within cohorts, attempts were made to introduce a random intercept term for each cohort. However, including this additional random effect resulted in singular model fits (estimated variance of zero for the random effect) and convergence issues. This is a common occurrence in models where random effects imply a structure that is complex relative to the sample size, and it is often an indicator that the random effect is unsupported by the data (Bates et al. 2015). Given this, a decision was made to omit this effect from the models. R package lme4 was used to carry out the analyses (Bates et al. 2015).

Table 1 Age, sex and race/ethnicity of participants at wave 1 ($n = 580$)

| Adolescents' grade/sex	African Americans	Caucasians	Hispanic and other minority	Total
Grade 6				
Boys	44	35	9	88
Girls	37	18	9	64
Grade 7				
Boys	43	31	4	78
Girls	28	29	13	70
Grade 8				
Boys	38	26	8	72
Girls	27	36	5	68
Grade 9				
Boys	33	26	9	68
Girls	36	28	8	72
Total	286	229	65	

Results

Descriptive Results

Table 1 summarizes study participants at Wave 1 across grade cohorts, ethnicity, and gender.

Throughout the study, approximately two out of five participants (39.5%) indicated that they were dating at the time of the survey. More students indicated they had a dating partner at wave 4 (45.4%) than during the initial wave of data collection (29.4%). Overall, nearly a third of participants (30%) reported involvement in a violent dating relationship, either as victims or perpetrators, at least at one point during the duration of the study. Of those, most participants (40%) admitted to a single experience of dating violence, with the majority reporting experiences as victims. Furthermore, experience of psychological victimization was the most frequently reported type of dating violence, endorsed by 20.5% of participants. Physical victimization was reported by 12.8% of participants and sexual victimization by 9.6%. A similar trend in the prevalence of dating abuse across different forms was observed in terms of perpetration, with 12% of adolescents reporting having perpetrated psychological violence, and 7.4 and 5% reporting physical and sexual violence, respectively. More than one in ten adolescents (11.9%) disclosed mutual dating violence, where any form of victimization was endorsed together with any form of perpetration.

There was no statistically significant association in overall dating violence rates by gender, X^2 (1, $N = 580$) = 0.73, $p = 0.39$ or ethnicity, X^2 (2, $N = 580$) = 2.6, $p = 0.28$. However, males reported perpetration at significantly higher rates than females, with 20.2% of boys and 10.2% of girls
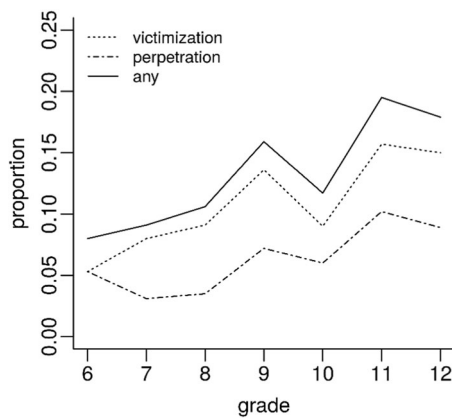
Fig. 1 Overall frequency of reported victimization and perpetration experiences by grade. "Any" category refers to participants who disclosed either any form of victimization or perpetration

Table 2 Proportion of adolescents reporting dating violence by grade within ethnicity

Dating violence	African American (%)	White (%)	Hispanic and other minority (%)
Dating violence victimization			
Grade 6	6.3	1.9	11.1
Grade 7	7.6	9.1	6.5
Grade 8	4.5	14.5	9.5
Grade 9	10.5	18.5	10.2
Grade 10	7.6	11.8	5.1
Grade 11	13.7	16.7	21.7
Grade 12	15.5	11.9	23.1
Dating violence perpetration			
Grade 6	8.8	0.0	5.6
Grade 7	3.4	3.6	0.0
Grade 8	2.5	4.2	4.9
Grade 9	5.3	8.3	11.9
Grade 10	8.2	4.9	0.0
Grade 11	12.0	9.4	4.3
Grade 12	7.0	9.5	15.4

reporting at least one instance of perpetration, X^2 (1, $N = 580$) = 10.4, $p = 0.001$. There was evidence of a weak association between victimization and ethnicity, X^2 (2, $N = 580$) = 4.7, p = 0.10 but not between perpetration and ethnicity, X^2 (2, $N = 580$) = 0.40, $p = 0.82$. On average, 22.4% of Black youth reported victimization in comparison to 30.6% of White and 29.2% of Hispanic and other minorities.

Overall, the percentage of adolescents reporting dating violence victimization increased from early to mid-adolescence, from approximately 5% in grade 6 to 15% in grade 12. A similar increase was observed among youth reporting perpetration, with 5% indicating they perpetrated dating violence in grade 6 in comparison with 9% in grade 12. Figure 1 shows these proportions. Additionally, even though reported victimization and perpetration experiences increased in the overall sample from middle- to high school, the percentages were higher among youths from some ethnic backgrounds. Table 2 presents the experiences of dating violence as a function of grade and ethnicity.

Trajectories of Dating Violence

We fit two latent curve models: model 1, in which girls and boys have separate trajectories and model 2, in which the three ethnicity groups have separate trajectories. Figure 2 shows the trajectories of victimization and perpetration plotted for males and females. Table 2 shows estimated coefficients and approximate p-values.

In the model predicting victimization (left panel of Table 3, Fig. 2), the main effect associated with gender is nearly zero, indicating that the average victimization probabilities are similar for boys and girls. Further calculations based on this model revealed that the initial (grade 6) victimization probabilities were higher for girls than boys: the estimated difference (on the logit scale) in the victimization rates

between boys and girls in the 6th grade is −1.25, with an approximate p-value of 0.028. The boys' estimated quadratic term for victimization was of large magnitude, $\beta = -11.29$, $SE = 5.72$, $p = 0.049$, suggesting that males' experiences of dating violence victimization follow a non-linear trajectory. For females, the data are less conclusive: the linear term suggests an upward trend in victimization, $\beta = 4.69$, $SE = 6.11$, $p = 0.44$, but this effect is not significant.

In the model for perpetration (right panel of Table 3, Fig. 2), there is strong evidence of the main effect of gender, $\beta = 0.99$, $SE = 0.30$, $p < 0.001$, indicating a higher average probability of perpetration of violence among boys. Additional calculations based on this model revealed that the estimated difference (on the logit scale) between the initial (grade 6) probability of perpetration between males and females is 0.19, with an approximate p-value of 0.81. Further, the p-value associated with the linear term for males' perpetration is statistically significant, $\beta = 17.28$, $SE = 6.94$, $p = 0.013$, indicating that there is a positive linear increase in dating violence perpetration among males as they get older. A linear increase in perpetration among females is weakly supported by the data, $\beta = 35.53$, $SE = 9.25$, $p = 0.14$ and a weak quadratic effect produces a steeper increase in perpetration among females in high school, in grades 10 through 12.

Figure 2 shows the estimated curves for victimization and perpetration, plotted separately for White, Black, and Hispanic and other minority students. Table 4 shows estimated coefficients and approximate p-values.

Fig. 2 Estimated trajectories of dating violence perpetration and victimization. The trajectories shown are on the probability scale
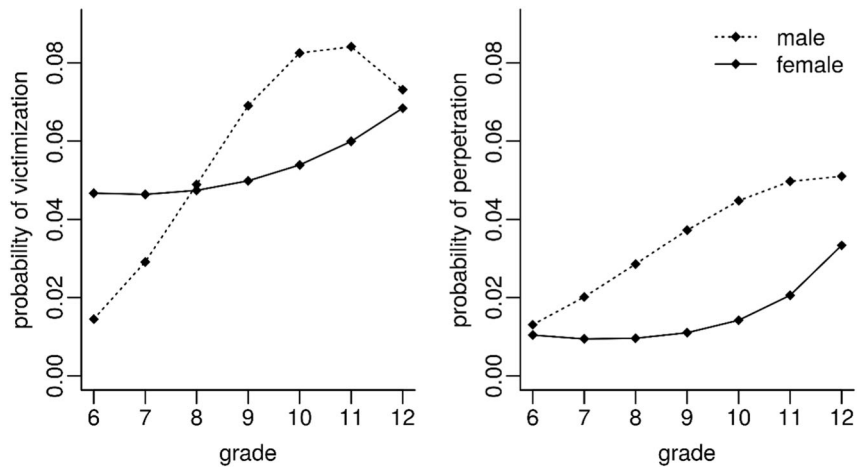
Table 3 Coefficient estimates and standard errors for the victimization and perpetration trajectories by gender

| Effect	Dating violence victimization			Dating violence perpetration		
	Coefficient	S.E.	p-value	Coefficient	S.E.	p-value
Intercept	−2.92	0.21	<0.001	−4.37	0.37	<0.001
Gender (male)	0.07	0.23	0.778	0.99	0.30	0.001
Linear trend; girls	4.69	6.11	0.443	13.53	9.25	0.143
Quadratic trend; girls	1.99	5.39	0.718	7.78	7.94	0.326
Linear trend; boys	21.14	6.40	0.001	17.28	6.94	0.013
Quadratic trend; boys	−11.29	5.73	0.049	−5.40	6.17	0.382

Estimates are presented on the logit scale. The linear and quadratic coefficients correspond to orthogonal polynomials based on student grade and squared grade

Table 4 Coefficient estimates and standard errors for the victimization and perpetration trajectories by ethnicity

Effect	Dating violence victimization			Dating violence perpetration		
	Coefficient	S.E.	p-value	Coefficient	S.E.	p-value
Intercept	−3.160	0.22	<0.001	−3.75	0.28	<0.001
Ethnicity (White)	0.055	0.24	0.024	−0.18	0.31	0.571
Ethnicity (Hispanic or other minority)	0.317	0.37	0.040	0.06	0.46	0.902
Linear trend; White	10.11	7.13	0.160	21.66	10.42	0.042
Quadratic trend; White	−18.92	6.79	0.005	−9.33	9.32	0.320
Linear trend; Black	15.29	6.46	0.018	14.45	7.44	0.051
Quadratic trend; Black	1.26	5.58	0.820	4.65	6.37	0.471
Linear trend; Hispanic	18.45	12.10	0.130	6.72	16.92	0.690
Quadratic trend; Hispanic	14.66	10.38	0.160	−6.06	14.22	0.672

Estimates are presented on the logit scale. The linear and quadratic coefficients correspond to orthogonal polynomials based on student grade and squared grade

Looking at the victimization trajectory (left panel of Table 4, Fig. 3), the positive coefficients associated with the main effect of ethnicity indicate a higher average probability of victimization for White, $\beta = 0.06$, $SE = 0.24$, $p = 0.024$ and Hispanic and other minority youth, $\beta = 0.32$, $SE = 0.37$, $p = 0.04$ in comparison with Black students (used as a reference group). Further calculations revealed no meaningful differences in initial (grade 6) probabilities of

victimization among the three ethnic groups of youth. Additionally, a significant negative coefficient associated with the quadratic term for White youth, $\beta = −18.92$, $SE = 6.79$, $p = 0.005$, suggests that adolescents from this group have a nonlinear change in victimization. The peak is observed in grades 9 and 10, followed by a decline. For Black youth, the coefficient associated with the linear trend was large, $\beta = 15.29$, $SE = 6.46$, $p = 0.018$, indicating that

Fig. 3 Estimated trajectories of dating violence victimization and perpetration by ethnicity
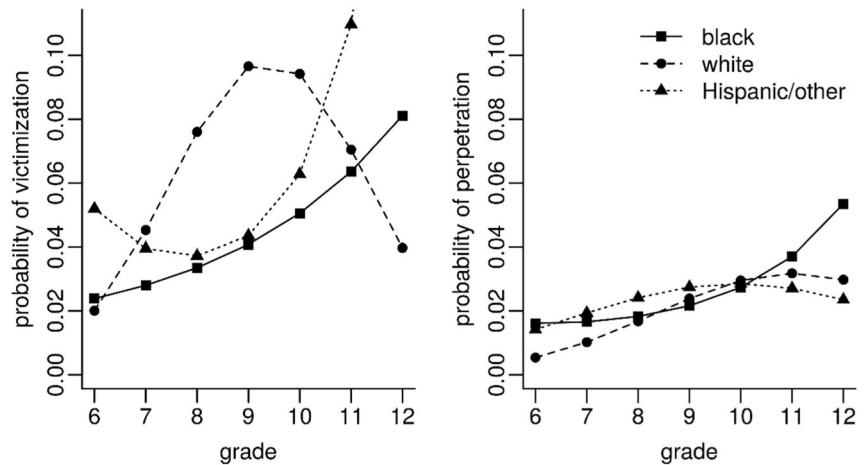
Table 5 Model comparison for linear, quadratic, and cubic trajectory shapes

Trajectory shape	Model 1: victimization		Model 1: perpetration		Model 2: victimization		Model 2: perpetration	
	AIC	BIC	AIC	BIC	AIC	BIC	AIC	BIC
Linear	1340.9	**1369.1**	**876.4**	**904.6**	1344.2	**1378.1**	877.8	**911.6**
Quadratic	**1340.4**	1379.8	878.5	918.0	**1337.1**	1387.9	880.9	931.7
Cubic	1343.4	1394.1	880.2	931.0	1339.5	1407.2	**875.5**	943.2

Minimum values for each model are marked bold

AIC Akaike information criterion, *BIC* Bayesian information criterion

victimization trajectory for this group is best represented by a linear increase. There is no strong evidence of non-zero linear or quadratic effects for Hispanic or other minority youth, $p = 0.13$ and $p = 0.16$, respectively.

Turning to perpetration (right panel of Table 4, Fig. 3), no non-zero main effects of ethnicity are observed, indicating that average probabilities of experiencing perpetration are not statistically different among the three ethnic groups of youth. Further calculations revealed no statistically significant differences in initial (grade 6) probabilities of perpetration among the three ethnic groups of youth. However, two linear terms had large, positive estimates: one for White youth, $\beta = 21.66$, $SE = 10.42$, $p = 0.04$ and the other for Black youth, $\beta = 14.45$, $SE = 7.44$, $p = 0.05$. This provides some evidence that perpetration trajectories among White and Black youth follow a linear increase. There is no strong evidence of non-zero linear or quadratic effects for Hispanic or other minority youth, $p = 0.69$ and $p = 0.67$, respectively.

Model Comparison and Sensitivity Analyses

The analytical results depend heavily on the specified shape of the trajectory. The quadratic model was chosen to account for the possibility of a peak in dating violence while avoiding the numerical instabilities that accompany more complex shapes. To assess the validity of this decision, three alternative models were compared: (a) one with a linear trajectory, (b) one with a cubic trajectory, and (c) one in which an unconstrained trajectory (accomplished by including student grade as a categorical predictor in the model) was included. For each of the four models, Table 5 (which could be moved to the Appendix) shows approximate values of two conventional measures of goodness-of-fit, Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC), for the models as fit without multiple imputation of the missing data. Low values of AIC and BIC indicate preferable models. Based on these criteria, no single shape is optimal for all models. The quadratic model is preferred based on AIC for the victimization curves, although the BIC indicator tends to favor the simpler linear trajectories and penalizes large sample sizes. It should be noted that agreement is yet to be reached with regard to the best set of indicators for a best model fit, often forcing researchers to choose among competing explanations. Additional comparisons included consideration of fixed effects of ethnicity and gender in models 1 and 2, respectively. No substantial differences in shapes of the estimated trajectories were found.

Discussion

Adolescent dating violence continues to be a topic of concern for adolescents, parents and communities. Although there is consensus in the literature that the risk of dating violence increases as adolescents get older (Leadbeater et al. 2018), agreement is yet to be reached with regard to developmental trajectory of dating violence victimization and perpetration. Moreover, little is known about changes in the prevalence of dating violence among adolescents in rural areas. Understanding how dating violence changes over time is an important first step in designing prevention and treatment programs to effectively reduce both short term and long term harmful effects. Using cohort-sequential latent growth modeling, the current study found increasing prevalence of dating abuse victimization and perpetration as teens transition from middle to high school. Specifically, a nearly threefold increase was observed in the proportion of students reporting dating violence victimization between grades 6 and 12. For perpetration, the rates almost doubled between early middle school and high school. This finding is in line with prior research that suggested that the risk for dating violence increases as adolescents get older (Leadbeater et al. 2018; Johnson et al. 2015). However, a closer examination of these trend revealed substantial variation in when adolescents are more likely to experience abuse (victimization and perpetration) in dating relationships, depending, in part, on gender and ethnicity.

The Effect of Gender

Age-related patterns in victimization revealed distinctive trajectories for females and males. Although results indicated that the proportion of victims of dating violence increases as adolescents begin high school, the study also suggested that this upward trend might be accounted for by the growing proportion of high school boys who experience victimization. As indicated earlier, dating violence victimization had a quadratic pattern with a peak at grade 11 (average age = 16.5) and was observed specifically among male students. By contrast, reports of dating victimization among female students remained consistent from middle to high school. These results are similar to the findings of Fernandez-Gonzalez et al. (2014) both with regard to the overall shape of victimization trajectory and peak times of dating aggression. However, our study did not find support of a curvilinear trajectory for victimization among girls. Although it is important to rely on existing literature in discussing the effect of gender on teen dating violence, such comparisons should be drawn in the context of the current focus on the prevalence of dating violence (reported vs. not reported) as opposed to other operationalization of dating aggression (intensity, frequency, or types of dating abuse).

Additionally, the gender effect should be interpreted in the context of initial differences in victimization rates between females and males. As noted, the proportion of females reporting victimization in early middle school was higher than that of males. In grade 6, 9.5% of female students reported victimization, compared to only 2.3% of males. Male students, however, reported steadily increasing rates of victimization throughout middle school, with rates exceeding those among females. Furthermore, the significant negative quadratic trend pointed to a decline in rates of victimization among high-school boys, while for girls, victimization rates remained relatively stable throughout adolescence. It is possible that females, upon beginning a romantic relationship, stay in it despite abuse characterizing their relationship. Banister et al. (2003) also found that adolescent girls were reluctant to leave violent dating relationships and further speculated that a girl's perception of a relationship as highly significant might be the reason for maintaining the relationship.

Equally important is that although victimization trajectories differ both in terms of shape and magnitude of changes between females and males, they seem to converge around the ages of 16–17. Such patterns suggest that the gender distinction in victimization trajectories becomes less pronounced as adolescents get older. This finding is similar to results of Reidy et al. (2015) who reported that gender influences on dating victimization (in particular, sexual violence) dissipated with age.

For perpetration, the evidence of a steady linear increase in the proportion of males reporting dating violence perpetration is contrasted with a somewhat stable trend in the proportion of females reporting the same experiences, although there is a spike in perpetration among females in grades 10 through 12. This finding partially builds on prior research suggesting different perpetration patterns for females and males. For example, Shorey et al. (2017) found that the risk of onset for dating perpetration was highest around the ages of 15 and 16 among females and at or before age 18 among males. By contrast, Johnson et al. (2015) demonstrated that females reported greater perpetration at all ages and that the peak of perpetration among females was observed at later ages (approximately at age 21) in comparison with males (approximately between the ages of 18 and 20). The study also found that the gender gap was the lowest among early adolescents (grades 6 and 7), widening among adolescents in grades 8 through 11 and then narrowing again among youth in grade 12.

Overall, these findings confirm previous research that suggested that the effect of gender might not be consistent throughout the entire period of adolescence. Indeed, previous research with high-risk youth established that age moderates the influence of gender on dating violence (Reidy et al. 2015). At specific times during adolescence (e.g., early

teen years), males might be more vulnerable to dating violence victimization in comparison with females. Therefore, prevalence rates might be higher among younger males than females. Likewise, at other times during adolescence (mid-to late teen years), females might be more at risk for relationship violence than males. In the Reidy et al. study, for instance, older girls reported perpetration involving injury more at higher rates than boys. Similarly, Taylor and Mumford (2016) found that girls ages 15–18 reported perpetrating violence at more than twice the rate of younger girls and three times the rate compared with boys in the same age range. These descriptive findings not only point to the need to consider age-related changes in estimating the prevalence of dating violence among female and male adolescents but also to consider other developmental shifts that might accompany the course of dating violence victimization and perpetration.

The Effect of Ethnicity

The findings related to the association between race/ethnicity and dating violence trajectories revealed that adolescents from different racial/ethnic origins had distinct trajectories of dating victimization but not perpetration. Specifically, White youth had a curvilinear trajectory for victimization, with the peak at grades 9 and 10, followed by a decline. By contrast, victimization among Black youth followed a linear increase. The shapes for perpetration trajectories were similar among White and Black youth. Equally important is the finding that no statistically significant changes in the progression of either victimization or perpetration were documented among Hispanic and other minority groups. In part, these results contrast with prior research that documented that race/ethnicity does not influence the course of development of any type of dating perpetration (Foshee et al. 2009). It is important to note that ethnic composition of youth in our sample did not match that in the study of Foshee et al. Additionally, the latter used two categories to denote participants' race/ethnicity—White and minority, while the current study included three subgroups—White, Black and Hispanic and other. A study by Giordano et al. (2015) documented that Black romantic relationships were of longer duration than White relationships during adolescence. It may well be that the linear trend in Black dating relationships has to do with the length of the relationship.

Additionally, this study found no evidence of racial/ethnic differences in initial rates of either victimization or perpetration rates, which contrasts previous studies (Kann et al. 2018). The finding that race/ethnicity does not seem to influence the overall prevalence of dating perpetration also contrasts with prior research that indicates that youth from minority backgrounds seem to be at a higher risk of various

types of dating violence perpetration (Orpinas et al. 2013). Finally, the finding that beginning with early middle school (grade 6), adolescents from all racial/ethnic groups have approximately similar likelihood of dating violence perpetration throughout the period of adolescence is also hard to reconcile with prior research. For example, Foshee et al. (2009) found that minority students reported greater levels of physical perpetration in comparison with students from majority groups. Of note, these differences were noted at each examined age. These discrepant findings might be attributable to the study sample where the majority of students were African Americans. In addition to peculiarities of the sample, it is plausible that some differences in age-related patterns among youth from different racial/ethnic groups are explained by differences in the interpretation of measures.

It is worth noting that because research examining the influence of race/ethnicity on age-related patterns in dating violence is limited, findings from cross-sectional studies are often used to explain associations between dating violence and this demographic characteristic. However, researchers have cautioned against generalizing ethnicity effects given inconsistency in findings. As Silverman et al. (2001) summarized, "…inconsistency in assessment of race/ethnicity across survey years and the smaller numbers of participating racial/ethnic minority students limit our understanding of how the issues investigated [teen dating violence lifetime prevalence] may differ across different racial/ethnic groups" (p. 578). More generally, however, these initial descriptions of different patterns of victimization between White and Black youth reflect larger social and cultural influences and emphasize the importance of integrating adolescents' social identities for a more accurate account of teen dating abuse (Eaton and Stephens 2018).

More research is needed to uncover how the demographic characteristic of race/ethnicity shape trajectories of dating victimization and perpetration. The conclusions reached about race in this study are very context specific. The social construction of race by adolescents in many rural parts of the Southeast of the United States is shaped by a relatively large percentage of African Americans and almost no other minorities as well as by a distinct geographical race history. Because there is likely more racial diversity in other rural and urban areas, future research on race should contain descriptions of the role racial identity plays in the cultural context of the research.

Implications for Research and Practice

The findings of this study are hoped to be of use to policymakers and school officials. According to a recent report of the Rural School and Community Trust, more than one in four schools in the U.S. are rural, with over one in six

children across the country attending these schools (Showalter et al. 2017). Although these numbers are substantial, it is unclear to what extent dating violence prevention initiatives reach these populations. Nationwide, nearly half of the states have laws that require school officials to develop curricula on dating violence. Yet, reliable up-to-date information about implementation of various dating violence prevention initiatives in rural schools is lacking. Therefore, the finding that dating violence is pervasive in rural areas, with approximately one in three middle- and high-school students reporting either victimization or perpetration experiences in the course of the study, lends further support to increasing attention to and investment in dating violence prevention initiatives.

Despite a lack of standardized approach to dating violence prevention in rural areas, there are anecdotal examples of successful programs that have been implemented in rural areas (e.g., "Teach One Reach One" initiative, a community-based participatory research project (Ritchwood et al. 2015). A key limitation of many such initiatives is a lack of rigorous evaluation. Similar to research on rural dating violence, evaluations of various interventions rarely account for the rural context per se, making it difficult to understand which elements are key for achieving positive outcomes among rural participants (Robinson and Ryder 2014). Therefore, it is imperative that not only programs are developed with an explicit consideration of rural context (cultural norms, etc.) but also that evaluation of these initiatives are conducted with attention to rural characteristics as well.

A related implication is the need for a more precise consideration of age, gender and related demographics in both program design and evaluation. Variation in rates of dating violence victimization and perpetration among youth of different ages presents a challenge for policy makers and practitioners who are working to reduce violence across the lifespan (Copp and Johnson 2015). Understanding how the prevalence of dating abuse changes throughout different stages of adolescence is important for effective intervention efforts and is essential for timing intervention strategies at the most opportune times. Yet, the majority of evaluations do not offer a nuanced (achievable through disaggregating data by sex, race/ethnicity, etc.) view of program impact, making it difficult to uncover potential differential influences depending on participants' characteristics. Based on results from the present research as well as findings from previous inquiries, efforts to address violence among adolescents should be carefully timed. For males, it is important to focus prevention efforts on early middle school years before the peak of dating victimization.

Additionally, for females, it might be more appropriate to initiate primary prevention programs even earlier, during pre-adolescence, while also shifting the focus to other aspects of dating, such as how to address conflict in close relationships. Previous research showed that destructive communication skills are associated with physical dating violence perpetration (Foshee et al. 2008). As noted earlier, the development of emotional regulation during pre-adolescence and adolescence is an important process that should be integrated into any prevention/intervention approach. At later ages, strategies on how to manage a relationship characterized by abuse might be especially relevant as it appears that the proportion of girls reporting abuse remains relatively stable throughout adolescence. Clearly, interventions aimed at equipping adolescents with conflict resolution skills should be carefully designed and implemented among both girls and boys.

Of concern are the findings related to the trajectory of dating violence perpetration among females which showed that 10th to 12th grades may be a period during which dating abuse escalates especially among females. From a primary prevention perspective, programming to address dating violence perpetration should be initiated before adolescents begin high school. At the same time, findings of this study suggest that it is important to continue prevention efforts as adolescents transition out of middle school. Although many adolescent dating violence programs, including evidence-based initiatives, such as Safe Dates (Foshee et al. 2004), are developed for adolescents in middle schools, evidence suggests that they might not be equally effective for boys and girls. For example, evaluation of two evidence-based programs, the Fourth R: Strategies for Healthy Teen Relationships (Wolfe et al. 2009) and Expect Respect Support Groups (Ball et al. 2012), showed promising results for boys but not for girls on a number of dating violence outcomes. This study indicates that not only programs need to be available to adolescent girls in high school but also that programs that target both boys and girls could be enhanced with a gender-specific component.

At the same time, it is important to note that as both female and male students approach senior status in high school, the differences in both perpetration and victimization rates between them become smaller. A possible explanation for the discrepancies in gender effects involves consideration of operational definitions of dating violence. For instance, the inclusion of verbal abuse in the present study might have masked gender influences on other types of dating violence. As some research demonstrated, some forms of dating violence, such as psychological abuse, may escalate especially among older females, while sexual violence can increase among older males (Sears et al. 2007). However, it is not possible to disentangle the effects of individual types of victimization and perpetration experiences because of the low frequency of endorsed victimization and perpetration items and instability of standard errors. Another explanation is also in the realm of

measurement. It is possible that the meaning attributed to dating violence questions differs between younger adolescent boys and girl and as they get older, the items are interpreted in a similar way. Thus, more research is needed to investigate longitudinal measurement invariance of measures dating violence. Additionally, future studies are needed to help uncover factors that might explain the diminishing influence of gender. In sum, the potential program and policy implications start with a careful review of existing interventions for middle and high school youth and identifying elements where improvements could be made. Before designing new interventions, it is essential to have a thorough understanding of the effectiveness of existing programs and services.

Beyond implications for timing interventions, this study suggests that cultural factors should be carefully considered. For example, while there appears to be a decline in victimization rates among White youth in high school, reports of victimization appear to be increasing steadily among Black students in the same grades. However, for effective interventions to address these distinct trajectories, several questions need to be considered. First, what remains to be answered is why dating violence trajectories differ depending on demographic factors, such as race. Second, why race impacts victimization trajectories but not perpetration patterns. Furthermore, the finding that different groups of adolescents follow distinct trajectories of violence victimization and perpetration calls for a detailed examination of additional demographic factors beyond the basic characteristics of gender and race. As well, it is important to consider intersections among various demographic influences, such as intersectionality between race and gender (Burgess-Proctor 2006; Eaton and Stephens 2018). Thus, more research is needed to investigate what and how psychosocial factors along with contextual influences shape these trajectories.

Additionally, although it is important to rely on existing literature in discussing the effect of gender and ethnicity on teen dating violence, such comparisons should be drawn in the context of the current focus on the prevalence of dating violence (reported experiences vs not reported or not experienced) as opposed to other operationalizations of dating aggression (intensity, frequency, or types of dating abuse). Future research is needed to help clarify the influence of gender and ethnicity on teen dating on the prevalence of victimization and perpetration at each specific age. For example, studies with longitudinal designs that allow one to take a person-centered analytical approach to examine how risk changes over time within the same individual could help answer some questions raised in this research. Additionally, future research is need to help address measurement-specific challenges associated with longitudinal designs. Although evidence of psychometric properties of multiple measures of dating violence among adolescents is accumulating, studies investigating how well these measures work for adolescents of different ages are lacking. For example, future research could examine whether adolescents assign the same or similar meaning to measures of dating violence in early adolescence and mid-to-late adolescence.

For rural schools and rural communities, there are several takeaways from the current study. First, given the prevalence of dating violence, schools should review their policies and programs and discern whether dating violence is highlighted. Although all schools prohibit violence, there is a continuum of diligence in pursuing violence prevention initiatives and this study underscores the need to include dating violence in current practices. Rural schools in particular are typically underfunded and might consider incorporating innovative technology in violence prevention efforts. Examples include: "It's Your Game… Keep it Real" (Peskin et al. 2019); "Safe Dates" (Foshee et al. 2005); "Family Safe Dates" (Foshee et al. 2012). Incorporating technology in prevention and health promotion efforts, the "Keep it Real" program integrates classroom- and computer-based activities, such as interactive skills-training exercises, videos and animations (Peskin et al. 2019). Finally, although some dating violence prevention programs demonstrated effectiveness with urban or suburban youth, future dating violence prevention programmers might consider whether these programs have differential effectiveness given the smaller number of students in schools and often limited community resources.

Strengths and Limitations

This study expands and strengthens the literature on teen dating violence in several ways. First, the study used a robust sample of both male and female youth with diverse ethnic/racial backgrounds living in a rural area in the United States. Participants came from a general population of students enrolled in public schools, whereas much previous research relied on convenience samples or subsamples of youth with various at-risk characteristics (Fedina et al. 2016). An additional strength is that the present study involved younger adolescents, a population which is understudied in research on youth dating violence. Second, this research focused on teen dating violence victimization *and* perpetration, which provides a more complete assessment of violence in adolescent dating relationships. Previous investigations of dating violence typically focused on victimization only or very specific forms of violence, thus limiting the ability to address complexity inherent in the phenomenon of teen dating violence and, consequently, restricting implications that could be drawn from those investigations.

A cohort-sequential design of the study is a special strength which allowed examination of a 7-year developmental span with four years of data. Importantly, the dropout rate remained low throughout the study. Additional features that should be highlighted include the use of a binary measure to model growth curves. Rates of dating violence are low in pre- and early adolescence making it difficult to use applications that require standard normally distributed variables. This study used an alternative approach by using a binary variable to differentiate between youth who reported dating abuse from those who did not (modeled after Duncan et al. 2006).

This study has several limitations. Some limitations of this investigation relate to measurement. Specifically, the measures of teen dating victimization and perpetration combined a limited number of violent experiences that varied in the level of aggression (for example, yelling and name-calling and being forced to have sexual intercourse). Moreover, the intensity or frequency of these experiences was not assessed. Combining items comprising different types of violent experiences into a composite measure might have obscured some nuances of teen dating aggression. Furthermore, the study did not assess whether self-reported dating violence was mutual or bidirectional. Some researchers have called for a simultaneous investigation of victimization and perpetration (Chiodo et al. 2012), given frequently observed co-occurrence between these types of abuse, while others have advocated for separate investigation of victimization and perpetration considering variation in consequences of each type of abuse as well as risk factors (Martin-Storey and Fromme 2016).

Further, it is important to bear in mind numerous alternatives for defining and measuring dating violence. For example, some researchers have called for a more focused examination of teen dating violence that considers various types of aggressive behavior—e.g., psychological, physical, and sexual—separately rather than a single construct (Hokoda et al. 2012). At the same time, others have used a full range of aggressive events to define the continuum of a violent relationship, or have include time constraints, such as experience of violence in the last 12 months, thus limiting the experience of adolescent dating violence. Therefore, the nature of the measure of teen dating violence in this study should be considered when interpreting results. This limitation should be viewed in the context of related literature on challenges in studying violent relationships among adolescents, including a variety of approaches to operationalize and measure teen dating violence (Hamby and Turner 2013). A further concern is that relationship continuity was not assessed. Because examination of age-related patterns throughout a lengthy period could potentially cover more than one relationship and because prior research showed that relationship quality is a key factor in explaining age variation in dating violence, the

absence of indicators of dating relationship can be seen as a limitation (Johnson et al. 2015). However, given that the primary goal of our study was to describe rather than explain age-related pattern in dating aggression, we deliberately excluded any explanatory variables.

There are constraints on the generalizability of the findings of this study due to a low initial response rate. Additionally, the data for present research came from adolescents and caregivers in a rural county in the southeastern U.S. Therefore, it might not be possible to generalize findings to youths and caregivers in urban or suburban areas. Moreover, participants for this study were residents of the same county, and thus, study results may lack generalizability to rural communities in other regions. Importantly, the proportion of African-Americans exceeds that of Whites in the study despite the fact that the majority of rural residents in the county in which the study was conducted identifies as White. Additionally, the proportion of participants who were categorized as belonging to Hispanic/Latinx and other minority group was small. The study sample thus limits generalizations that could be drawn from this research. For example, it is possible that findings reflect the reality of a specific segment of rural youth—those who are similar to adolescents who chose to participate in this research. At the same time, it should be noted that racial/ethnic diversity has been increasing in rural schools across the nation rapidly, making it challenging to produce an accurate portrait of students in those schools. Additionally, it should be noted that low-response rate is a common disadvantage of studies that utilize self-report questionnaires as a method of data collection (Coughlan et al. 2009). Survey research methodologists have warned about an alarming trend toward low response rates among participants in the U.S. and globally (Porter 2004).

Finally, as is common with the majority of studies of adolescent dating violence, we relied on self-reports, which might have introduced some bias. Another concern is that there might be some bias because the study was advertised as investigating factors related to dating violence. Many parents may have declined participation on behalf of their children because they thought the study applied only to adolescents who were in a dating relationship or to those who may have experienced dating violence. Nevertheless, the findings of this study could be used to guide future research efforts. For example, researchers could use a similar approach to outline trajectories of dating violence among populations in other rural communities across the U.S.

Conclusion

High rates of dating violence among adolescents threaten optimal development and call for a deeper understanding of how dating violence evolves during this critical period.

There is a need for research that examines the trajectory of dating violence, especially among rural youth. Accordingly, dating victimization and perpetration trajectories among rural youth in middle and high school across four years were gathered and analyzed. The results revealed that for boys, victimization peaked at 11th grade, and then declined. For girls, victimization was stable throughout adolescence. Over time, perpetration increased steadily for males and females. For White youth, victimization peaked at grades 9 and 10, followed by a decline. For Black youth, victimization followed a linear increase. The results suggest that violence prevention efforts, whether through policy or programs, need to begin in middle school and be persistent throughout adolescence. Furthermore, the study indicates that in addition to focusing on the programmatic aspects of various programs (the what), the timing of such programs or program components (the when) should be carefully considered. Because the development of appropriate dating behavior in adolescence is essential for safety as well as the growth of long-term healthy relationships, prevention approaches should also be developmentally appropriate.

Compliance with Ethical Standards

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