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Protective Factors for Sexual Violence: Understanding How Trajectories Relate to Perpetration in High School

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Abstract

Adolescent sexual violence (SV) perpetration is a significant public health problem. Many risk factors for perpetration are known, but less is known about what protects youth from perpetration, or how protective factors change over time. This longitudinal study reports trajectories of four potential protective factors for SV perpetration (empathy, parental monitoring, social support, and school belonging) across middle and high school and examines their relationship to SV perpetration in high school. Findings reveal that youth who identified as SV perpetrators had significantly lower mean empathy scores ($d = -0.18$, 95 % CI $[-0.26, -0.10]$) and social support scores ($d = -0.05$, 95 % CI $[-0.14, -0.03]$) at the beginning of middle school than non-perpetrators. We also found that youth who identified as SV perpetrators had a quicker deceleration in parental monitoring (slopes) and empathy from middle to high school, compared to non-perpetrators. Within-sex differences emerged; significant differences in slopes were detected for school belonging between male perpetrators and male non-perpetrators (Wald test = 3.76 (1), $p = .05$) and between female perpetrators and female non-perpetrators (Wald test = 3.95(1), $p = .04$). Significant differences in slopes for empathy between female perpetrators and female non-perpetrators (Wald test = 4.76(1), $p = .03$) were also detected. No differences were found between male and female SV perpetrators for either empathy or school belonging. These findings have implications for the content and timing of adolescent SV prevention efforts. Intervention in adolescence, involving parents and schools in a comprehensive, multi-level approach, may be effective in preventing SV perpetration.

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Conflict of Interest The authors declare that they have no conflict of interest.

Research Involving Human Participants All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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Keywords

Sexual violence; Perpetration; Protective factors; Adolescents; Trajectories

Introduction

Sexual violence (SV), defined as unwanted sexual contact without consent (Basile et al. 2014), is an urgent public health issue with approximately 1 in 5 women reporting rape victimization, and about 1 in 17 men reporting being made to sexually penetrate someone (forced or alcohol/drug facilitated completed or attempted penetration) in their lifetime (Smith et al. 2017). Youth, in particular, are often victims of SV; 41.3% of female rape victims were first raped before their 18th birthday, and 24.3% of male victims who were made to penetrate experienced it before age 18 (Smith et al. 2017). In addition to penetrative acts, the American Association for University Women's (AAUW) nationally representative online survey of 7th–12th grade students found that an estimated 56% of girls and 48% of boys have been victimized by some form of in-person or online sexual harassment (e.g., unwelcome comments, touching, intimidation, or force to do something sexual) during the school year (Hill and Kearl 2011).

Nationally representative SV *perpetration* data, while important for prevention, are less available; however, the AAUW study found that 16% (14% of girls and 18% of boys) reported sexual harassment perpetration (defined similarly as victimization) against another student either in-person (15%) or electronically (10%). Most male (80%) and female (92%) harassment perpetrators were also sexual harassment victims (Hill and Kearl 2011). In addition, a recent online study of 10–21 year olds by Ybarra and Thompson (2017) found that 23% of male and 17% of female youth reported sexual harassment perpetration (measured similarly as AAUW). These data suggest that both SV victimization and perpetration start early in life.

Some have argued that SV prevention efforts would have the largest impact on the public's health if they focused on preventing SV *perpetration* (Basile 2015; Tharp et al. 2013). Across numerous studies, substance use, rape supportive attitudes, childhood abuse, witnessing parental violence, low parental support/monitoring, and negative peer influences are consistent risk factors for adolescent SV perpetration (Banyard et al. 2006; Borowsky et al. 1997; Maxwell et al. 2003; White and Smith 2004). We know less about protective factors related to SV perpetration.

While scholarship on protective factors is still developing in the larger field of violence prevention, some have argued that protective factors can either operate directly to reduce a negative outcome or act as buffering factors that remove or lessen the impact of existing risk factors (Losel and Farrington 2012). A small number of protective factors have been found to be associated with SV perpetration. Borowsky et al. (1997) found that emotional health and community connectedness were significant protective factors for adolescent male sexual aggression, while academic achievement was protective for female sexual aggression. In a study comparing risk and protective factors for adolescent SV perpetration in dating versus same-sex peer relationships, social support was protective even when controlling for risks

(e.g., previous adolescent SV victimization, heavy episodic drinking), but only in the context of same-sex peer SV perpetration (Basile et al. 2013). While these studies are helpful in understanding what might protect against perpetrating SV, they rely on cross-sectional data that does not allow for an understanding of time order or changes over time in factors.

Studies that have examined some protective factors, such as empathy, parental monitoring, or social adjustment/support, have often conceptualized them as deficits. For example, low empathy has been linked to SV perpetration (Farr et al. 2004; Marshall and Moulden 2001). Lack of maternal monitoring has been associated with physical dating violence, bullying, and sexual harassment perpetration in adolescence (Foshee et al. 2016). Research with juvenile sex offenders found that they were more likely than juvenile non-sex offenders and juvenile non-delinquents to have fewer attachments to peers and school (Minor and Crimmins 1995). Using a resilience framework (Masten and Monn 2015), there is value, however, in conceptualizing these factors as protective against violence, controlling for the influence of other negative exposures, because this conceptualization can more readily inform prevention efforts. Resilience in this context refers to the capacity of an individual to successfully adapt to challenges and involves interplay with other influences (e.g., family, community) (Masten and Monn 2015). Moreover, a resilience framework suggests that even in the absence of adversity, protective skills, resources, and support are needed to promote healthy development over time (Masten and Monn 2015).

Resilience and the influence of protective factors is dynamic as their influence may change as youth develop. Failure to acknowledge this and account for it in research designs may help explain why protective factors are rarely significant in multivariate models explaining violence perpetration. Some factors, particularly those at relational levels (e.g., social support, parental monitoring), may be especially important for resilience from experiences of interpersonal violence in adolescence, as peer and romantic relationships become increasingly salient (Brown and Larson 2009). Further, factors that protect someone from perpetration in early adolescence, such as parental support or monitoring, may not be as effective in later adolescence, especially if levels of those protective factors change over time. For example, parental monitoring decreases as children progress from middle school into high school given that adolescence is marked by increasing autonomy (Dishion and McMahon 1998; Stattin and Kerr 2000). As such, we might expect this decrease in parental monitoring to increase youth's risk for perpetration. However, no research to date has examined how protective factor trajectories contribute to the likelihood of SV perpetration over time. Longitudinal research is needed to understand how resilience in adolescence manifests, and how different protective factor trajectories contribute to reducing SV perpetration during this important developmental stage.

The importance of examining developmental trajectories is also reinforced by sex differences that have been identified in the literature. Differential gender socialization theory (Pettitt 2004) suggests that children are treated differently based on the gender roles assigned to them and that identification with those gender roles intensifies in adolescence. For instance, existing research suggests that throughout adolescence, females' empathy increases to a greater extent than males' (Mestre et al. 2009; Van der Graaff et al. 2014).

This research underscores the importance of exploring sex differences in pathways to SV perpetration to better inform prevention efforts.

The Current Study

In this paper, we examine trajectories of potential protective factors for SV perpetration across middle and high school, including empathy, social support, parental monitoring, and school belonging, as they relate to later SV perpetration in high school. Consistent with a resilience framework and developmental theory that stresses the salience of relationships in adolescence (Masten and Monn 2015; Brown and Larson 2009), we focused on relational protective factors that interplay with different levels of influence (peers, parents, school). We hypothesized that protective factor trajectories across middle and high school would be significantly different for those who did and did not perpetrate SV in high school such that protective factors would be consistently higher for non-perpetrators. We also expected differences in trajectories by sex given previous research (Borowsky et al. 1997).

Methods

Participants

Participants included 3549 students from four Midwestern middle schools and six high schools. The survey was administered at seven time points from spring 2008 to spring 2013. Data were collected 6 months apart during the middle school time points (waves 0–3; spring, fall, spring, fall across 2 years) and 1 year apart (spring semesters across 2 years) during the high school time points (waves 4 and 5). One wave of data collected at the end of middle school was excluded because the items used in this analysis were not measured during that wave. As a result, this paper presents data from waves 0–3 (middle school from beginning of grade 5 to 8) and waves 4 and 5 (high school grades 9–12).

Procedures

Prior to data collection, parental consent forms were sent to all parents to sign and return only if they did not want their child to participate in the study. During data collection, students were read an assent script and could opt out if they wanted to. Trained proctors obtained student assent, described the study, read the survey aloud while students completed it, and answered questions. Students completed the survey in school during regular hours, which took about 30 min. They received resources for SV at the end of the survey administration.

Measures

Demographic and Risk Factor Control Variables—The following demographic characteristics were controlled for at baseline (beginning of middle school): self-reported age, race, biological sex, and maternal education (high school or less as reference group). Further, to ensure our models controlled for important *risk* factors at baseline, we also controlled for history of trauma (childhood sexual abuse, physical abuse, exposure to domestic violence), family violence (e.g., yelling, arguing, losing temper, fights by family members), substance use (alcohol, marijuana, illicit drug use), bullying (e.g., teasing, name calling, social exclusion; University of Illinois Bully Scale, Espelage et al. 2003), middle

school SV perpetration, and impulsivity (four-item scale—e.g., “I need to use a lot of self-control to stay out of trouble”; Teen Conflict Survey, Espelage et al. 2000).

Protective Factors

Empathy: The five-item Empathy subscale of the Teen Conflict Scale (Bosworth and Espelage 1995) measures adolescents’ ability to listen to, care for, and trust others. Students were asked to indicate how often they would use items in the scale to describe themselves (e.g., “I can listen to others;” “I get upset when my friends are sad”). Response options are on a five-point Likert scale ranging from 0 (*Never*) through 4 (*Always*). High values indicate more frequent empathic behaviors. In the current study, Cronbach’s alpha ranged from 0.67 to 0.76 ($M_{alpha} = 0.75$) across waves.

Parental Monitoring: The eight-item Parental Monitoring/Supervision subscale from the Seattle Social Development Project (Arthur et al. 2002) was used to measure respondents’ perceptions of established familial rules and perceived parental awareness regarding schoolwork and attendance, peer relationships, alcohol or drug use, and weapon possession. Items are measured on a four-point Likert scale ranging from 0 (*Never*) through 3 (*Always*). Example items include, “My family has clear rules about alcohol and drug use” and “My parents ask if I’ve gotten my homework done.” In the current study, Cronbach’s alpha ranged from 0.86 to 0.90 ($M_{alpha} = 0.88$) across waves.

Social Support: The Vaux Social Support Record (VSSR) is a nine-item questionnaire that assesses the degree to which a person feels cared for, respected, and involved (Vaux 1988). The VSSR is comprised of three 3-item subscales that measure the support available from family, peers, and school respectively. Students were asked how many of each fit the description of each item (e.g., “I have friends I can talk to, who care about my feelings and what happens to me”). Response options were *None* (0), *Some* (1), and *All* (2). The VSSR subscales and total scale showed good internal consistency, with Cronbach alpha coefficients ranging from 0.83 to 0.94 ($M_{alpha} = 0.86$) across waves.

School Belonging Scale: Perceived belonging at school was assessed with 4 of the 20 items from the Psychological Sense of School Members Scale (Goodenow 1993). Students were asked how much they agree with statements such as “I feel proud of belonging to this school.” Response options ranged from “Strongly Disagree” (0) to “Strongly Agree” (4). In the current sample, Cronbach’s alpha ranged from 0.68 to 0.74 ($M_{alpha} = 0.72$) across waves.

High School Sexual Violence Perpetration—A modified version of the AAUW’s Sexual Harassment Survey (Hill and Kearl 2011), using 6 of the original 15 items, was used to assess SV perpetration during high school (Rinehart et al. 2017). Participants were presented with six items to assess unwanted verbal sexual harassment (i.e., sexual comments, sexual rumor spreading, and showing sexual pictures), and forced sexual contact (i.e., touching in a sexual way, physically intimidating in a sexual way, and forcing to do something sexual). Students were asked to consider how often in the current school year they had done each of these acts to other students at school (i.e., “Never,” “1 or 2 times,” “3 or 4 times,” “5 or 6 times,” and “7 or more times”). We assessed the structure of this

modified AAUW scale with an exploratory factor analysis (EFA) and then fit a confirmatory factor analysis (CFA) to the best fitting model. In order to do this, we randomly split the sample into two separate samples, the first of which was used to fit an EFA. Results suggested a one-factor solution fit the data best with all factor loadings ranging from 0.75 to 0.97 (CFI = 1.0, RMSEA = 0.00, $\chi^2 = 9.73$ (9), $p = .76$). Results from a CFA with the second sample indicated excellent model fit (CFI = 1.0, RMSEA = 0.01, $\chi^2 = 9.74$ (9), $p = .37$). Cronbach's alpha was 0.76. Because the distribution for perpetration was skewed, we dichotomized SV perpetration into ever engaging in any SV perpetration (1 = *yes*) or never engaging in SV perpetration (0 = *no*) during high school (last two waves).

Data Analytic Plan

The current study's focus was on differences in potential protective factor trajectories (empathy, parental monitoring, school belonging, and social support) across middle and high school for individuals who perpetrated SV in high school and those who did not. To this end, we estimated a series of multi-group latent growth curve models (MG-LGCM; Grimm et al. 2016), with SV perpetration (perpetrators vs. non-perpetrators) as our grouping variable. A series of unconditional latent growth curve models (LGCMs) indicated the functional form for each of our protective factors was linear. We then simultaneously estimated LGCM for both perpetrators and non-perpetrators for each protective factor. In general, multi-group modeling allows growth models to be specified, separately, for each group and tests the equality of intercepts and slopes across groups using a Wald test of parameter constraints. A significant Wald test would indicate significant differences between perpetrators and non-perpetrators for the parameter being tested (i.e., intercept and slope). All models were estimated using Mplus version 7.4 (Muthén and Muthén 1998–2012).

Given some differences by sex in the existing literature (e.g., Borowsky et al. 1997), we also sought to understand potential sex differences across each of the protective factors according to perpetration status. An interaction between biological sex (female reference group) and high school SV perpetration (perpetrator reference group) was entered into the model. Specifically, we tested whether significant differences existed between trajectory intercepts and slopes for both male and female SV perpetrators and non-perpetrators. A significant interaction would indicate sex differences for perpetrators and non-perpetrators for the protective factor being modeled. Thus, to understand where the interaction was finding differences, we tested if there was a statistically significant difference in the intercepts and slopes across male and female perpetrators and non-perpetrators by comparing the simple slopes in all possible pairwise comparison using the Wald test of parameter constraints. To interpret significant interactions, prototypical plots were generated for male and female perpetrators and non-perpetrators. To assess differences in a standardized metric, Cohen's *d* was calculated at three time points: (1) beginning of middle school, (2) end of middle school, and (3) high school. The intercept (mean level) was centered at each time point and Cohen's *d* was calculated based on intercept values. Negative values indicate that non-perpetrators have a higher empathy value.

Results

The sample was 32.2% white, 46.2% black, 5.4% Hispanic, and 10.2% other, and was 50.2% female (Table 1). At baseline, students were in 5th (30.5%), 6th (37.2%), or 7th (32.3%) grade; participants were freshmen, sophomores, or juniors in high school at the last wave. During high school, 20% of participants reported engaging in SV perpetration.

Multiple Group Latent Growth Curve Models

Models were fit starting with the most constrained (group invariant) to the least constrained model (complete group variance). Significant log likelihood ratio tests between models indicate a better fit when constraints were lifted (Supplemental Tables 1 and 2).

Empathy—Removing constraints across the four models from invariance to group variant were significant at each phase; thus, the final model included different intercepts, slopes, variances, covariances, and residual variances. Individuals who identified as SV perpetrators had a significant intercept ($\eta_1 = 9.04$, $SE = 0.312$, $p < .001$) but a non-significant slope ($\eta_2 = 0.105$, $SE = 0.092$, $p = .256$) (Table 2). That is, youth who identified as SV perpetrators had empathy scores that were greater than zero at baseline; however, these scores did not significantly change over time, indicating consistently low empathy scores from beginning of middle school through high school. However, individuals who did not perpetrate SV in high school had a higher (and significant) intercept ($\eta_1 = 10.41$, $SE = 0.142$, $p < .001$) and a significant increase in empathy over the study period ($\eta_2 = 0.151$, $SE = 0.010$, $p < .001$). A Wald test of parameter constraints indicated significant differences in intercepts (Wald = 15.92, $df = 1$, $p < .001$) and slopes (Wald = 5.32, $df = 1$, $p = .021$) (Fig. 1). That is, youth who engaged in SV perpetration had lower empathy scores in early middle school and remained lower throughout most of middle and high school.

Compared to non-perpetrators, SV perpetrators had significantly lower mean empathy scores at the beginning ($d = -0.18$, 95 % CI [-0.26, -0.10]) and end of middle school ($d = -0.04$, 95 % CI [-0.12, 0.04]); however, these differences were no longer significant during high school.

Parental Monitoring—Similar to empathy, results of model building (Supplemental Table 1) revealed complete group variance across all parameters. Individuals who engaged in SV perpetration in high school had significant intercepts ($\eta_1 = 17.99$, $SE = 0.103$, $p < .001$) and a significant decrease in parental monitoring over the study period ($\eta_2 = -0.580$, $SE = 0.029$, $p < .001$) (Table 2). Similar results were found for non-perpetrators with significant intercepts ($\eta_1 = 18.8$, $SE = 0.072$, $p < .001$) and a significant decrease in parental monitoring ($\eta_2 = -0.400$, $SE = 0.014$, $p < .001$). A Wald test of parameter constraints indicated non-significant differences in intercepts (Wald = 0.260, $df = 1$, $p = .610$) but significant differences in slopes (Wald = 35.6, $df = 1$, $p < .001$). Specifically, as youth progressed through middle school and into high school, youth who engaged in SV perpetration had baseline scores different from zero and quicker deceleration in parental monitoring compared to non-perpetrators. No significant mean differences were detected at the beginning of middle school ($d = -0.06$, 95 % CI [-0.14, 0.03]); however, compared to non-perpetrators, SV perpetrators reported lower parental monitoring at the end of middle school

($d = -0.41$, 95 % CI [-0.49, -0.33]) and in high school ($d = -0.43$, 95 % CI [-0.53, -0.35]) (Fig. 1).

School Belonging—For school belonging, model fit indices (Supplemental Table 1) indicated that allowing mean intercepts and slopes to vary across groups does not fit the data better than equal intercepts and slopes (Fig. 1 and Table 1). This would indicate that there are no significant differences between SV perpetrators and non-perpetrators in terms of starting values and growth in school belonging. Indeed, Wald tests for both intercepts (Wald = 0.767, $df = 1$, $p = .381$) and slopes (Wald = 0.001, $df = 1$, $p = .970$) revealed no significant differences across perpetrators and non-perpetrators. That is, both perpetrators and non-perpetrators had similar starting points and trajectories in school belonging. No significant mean differences were detected at any time point.

Social Support—For social support, model fit indices indicate that complete group variance across all parameters is the best fitting model (see Supplemental Table 1). Individuals who engaged in SV perpetration in high school had baseline scores significantly different from zero ($\eta_1 = 11.9$, SE = 0.191, $p < .001$) and a significant decrease in social support over the study period ($\eta_2 = -0.113$, SE = 0.057, $p = .046$) (Fig. 1 and Table 2). Similar results were found for non-perpetrators with significant intercepts ($\eta_1 = 12.7$, SE = 0.092, $p < .001$) and a significant decrease in social support from middle to high school ($\eta_2 = -0.313$, SE = 0.022, $p < .001$). A Wald test of parameter constraints indicated significant differences in intercepts (Wald = 17.49, $df = 1$, $p < .001$) and significant differences in slopes (Wald = 10.9, $df = 1$, $p = .01$). This indicates that youth who engaged in SV perpetration reported lower social support than non-perpetrators during early middle school, but non-perpetrators had a quicker deceleration of social support as youth progressed from middle school to high school.

Compared to non-perpetrators, SV perpetrators evidenced lower social support at the beginning of middle school ($d = -0.05$, 95 % CI [-0.14, -0.03]). No differences were detected at the end of middle school ($d = -0.41$, 95 % CI [-0.49, 0.33]) or during high school ($d = 0.05$, 95 % CI [-0.03, 0.13]).

Variation in Sexual Violence Perpetration by Biological Sex

Results indicated non-significant interaction effects for parental monitoring ($\eta_{1\hat{y}_1\hat{y}_2} = -0.110$, SE=0.307, $p = .720$; $\eta_{2\hat{y}_1\hat{y}_2} = 0.036$, SE=0.060, $p = .547$) and social support ($\eta_{1\hat{y}_1\hat{y}_2} = -0.031$, SE=0.188, $p = .868$; $\eta_{2\hat{y}_1\hat{y}_2} = 0.044$, SE=0.040, $p = .276$).

A significant effect was detected for empathy ($\eta_{1y_1\hat{y}_2} = -0.937$, SE=0.143, $p = .046$; $\eta_{2\hat{y}_1\hat{y}_2} = 0.036$, SE=0.108, $p = .010$) indicating that both intercept and trajectory differences in empathy for perpetrators and non-perpetrators are dependent on biological sex (Fig. 2). We found female perpetrators (Wald test of parameter constraints = 113.1 (1), $p < .001$) and male perpetrators (Wald test of parameter constraints = 64.4 (1), $p < .001$) had lower starting values for empathy than their non-perpetrator peers. No differences were found between male and female SV perpetrators. Significant differences between female perpetrators and female non-perpetrators slopes (Wald test of parameter

constraints = 4.76(1), $p = .03$) were detected, indicating that empathy for female perpetrators increased more rapidly than female non-perpetrators. There were no differences in slopes between male and female perpetrators or between male perpetrators and male non-perpetrators.

Contrary to findings in the MG-LGCM for school belonging, we found no differences for intercepts ($\eta_{1\hat{\gamma}1\hat{\gamma}2} = -0.122$, $SE=0.108$, $p = .257$), but a significant interaction with biological sex for change (slopes) in school belonging ($\eta_{2\hat{\gamma}1\hat{\gamma}2} = 0.067$, $SE=0.021$, $p = .002$) suggesting that the association between changes in school belonging and SV perpetration is dependent on biological sex (Fig. 2). We found significant differences in slopes when comparing within biological sex. That is, we found significant differences in slopes between male perpetrators and male non-perpetrators (Wald test of parameter constraints = 3.76(1), $p = .05$) and female perpetrators and female non-perpetrators (Wald test of parameter constraints = 3.95(1), $p = .04$). This indicates that both male and female SV perpetrators have steeper acceleration in school belonging compared to male and female non-perpetrators, respectively. No differences in slopes between male and female perpetrators for school belonging were detected.

Discussion

To our knowledge, this study is the first of its kind to examine trajectories of protective factors for adolescent SV perpetration over time. Findings suggest that SV perpetrators in high school experience some distinct trajectories of protective factors across middle and high school compared to those who did not perpetrate SV in high school, even after controlling for demographic characteristics and key risk factors in middle school. Overall, youth who did *not* perpetrate SV in high school experienced higher empathy, parental monitoring, school belonging, and social support over time than SV perpetrators, although not all differences were statistically significant or constant over time between groups. Specifically, earlier experiences tended to significantly differ between perpetrators and non-perpetrators for empathy and social support. In addition to variation in starting points, we also found differences in adolescents' trajectories for empathy, parental monitoring, and social support across middle and high school differentiated perpetrators and non-perpetrators.

Although parental monitoring decreased for both SV perpetrators and non-perpetrators over time, the decrease across middle and high school was steeper for perpetrators. While one would expect some decreases in parental monitoring over time given adolescents' increasing autonomy, the results suggest that sustaining higher parental monitoring as students enter high school may be protective against SV perpetration. Social support was also significantly different between SV perpetrators and non-perpetrators over time, and non-perpetrators experienced significantly higher social support at the beginning of middle school, suggesting the importance of increasing positive social connections among adolescents and their peers in early middle school. This is consistent with previous work finding that social support was protective against SV perpetration (Basile et al. 2013).

Empathy may also be protective as non-perpetrators demonstrated significantly higher empathy scores at the beginning and end of middle school, showing increases over time, though non-perpetrators and perpetrators became more similar in high school. These findings suggest that a delay in the development of empathy skills in early middle school is related to later SV perpetration. Interestingly, when examining trajectories for males and females separately, female perpetrators showed a steeper increase in empathy than their non-perpetrator female peers, though non-perpetrators were higher at all time points. In high school, females reported more empathy than males regardless of perpetration status. This is consistent with past research suggesting that females' empathy increases to a greater extent over the course of adolescence than males' (Mestre et al. 2009; Van der Graaff et al. 2014), which may explain the steeper increase observed for female perpetrators. They may be regaining empathy levels of their non-perpetrator counterparts because of sex differences in empathy that occur during adolescence. This interpretation is also consistent with differential gender socialization theories that posit that gender identification intensifies in adolescence (Pettitt 2004).

The only factor not significantly different between perpetrators and non-perpetrators was school belongingness, though significant differences were detected when considering sex. Although school belongingness increased over time for all participants, it more steeply increased for both male and female perpetrators when compared to their male and female counterparts, respectively. Both male and female non-perpetrators experienced greater school belongingness at earlier time points in middle school, but all participants eventually arrived at the same point in high school, suggesting the importance of early experiences of school belonging.

The current study findings have significant implications for preventing SV perpetration as several important protective factors were identified (with implications for both parents and schools) after controlling for known risk factors and being assessed longitudinally at different time points in development. Findings suggest that promoting sustained levels of parental monitoring as youth progress through middle and high school may be an important focus of efforts to prevent SV perpetration. These findings extend a plethora of research highlighting the protective nature of parental monitoring (Hoeve et al. 2009; Foshee et al. 2016). For example, in a meta-analysis of 161 published and unpublished studies examining the relationship between parenting and delinquency, lack of parental monitoring was one of the strongest forms of parenting significantly associated with the development of adolescent delinquency (Hoeve et al. 2009). The current study emphasizes the importance of parents in SV prevention, and the need for parental vigilance particularly during the transition from middle to high school. Efforts to educate parents about SV may be very important in adolescence.

Moreover, it may be beneficial for prevention efforts in the beginning of middle school to incorporate activities that increase empathy and encourage social support among youth. For example, social-emotional learning (SEL) programs are increasingly being used in schools to address aggression, bullying, and other forms of violence (Espelage 2015). SEL programs use social skills instruction to address behavior, safety, and academics to help youth become more self-aware, manage their emotions, build social skills (empathy, respect for diversity),

build friendship skills, and decrease their engagement in delinquent behavior (Zins et al. 2004). A recent clinical trial of a SEL program that focused on empathy and building strong relationships demonstrated a reduction in sexual harassment perpetration during the three-year middle school study (Espelage et al. 2015), suggesting that these types of programs may also be effective for SV prevention.

Focusing prevention efforts on younger ages is consistent with past research, as early SV perpetration is a significant risk factor for later perpetration. One study found that males who perpetrated SV in adolescence were more likely to perpetrate SV in college (White and Smith 2004), so primary prevention of adolescent perpetration may prevent perpetration in adulthood and offset its associated costs later in life. The current study also demonstrates the importance of understanding how protective factors change over time and the relationship of those trajectories to SV perpetration. While the trajectories of social support and parental monitoring decreased over time for both perpetrators and non-perpetrators, there was an earlier decline for those who perpetrated SV in high school, suggesting that prevention efforts should focus on sustaining higher levels of social support and parental monitoring through high school. However, these efforts may not be sufficient in isolation and, as in other violence prevention efforts, should be a component of a comprehensive prevention approach that addresses risk and protective factors at multiple levels of influence, consistent with strategies in the CDC technical package to prevent SV (Basile et al. 2016).

Future research is needed to understand why SV non-perpetrators experience sharper declines in social support in high school than SV perpetrators. Additionally, differential experiences by sex in protective factors should continue to be assessed because these differences seemed to impact the protective nature of empathy and school belonging in this study. Future research could also longitudinally assess other protective factors for SV perpetration that have been identified in the literature, including academic achievement, emotional health and connectedness, and parental reasoning to resolve conflict, in order to better understand the developmental impacts of those factors on SV perpetration (Tharp et al. 2013). Further, as many theories of aggression (e.g., social control, social cognitive theories) focus on deficits and risks, it is imperative that the field also considers a resilience framework and that protective factors are examined more explicitly in order to identify what behaviors to promote rather than only focusing on what risks to avoid. Ultimately, continued research like the current study will provide the field with the content and ideal developmental stages for effective SV prevention.

These results should be considered in the context of study limitations. First, survey results from Midwestern middle and high schools may not be generalizable across the USA or outside the USA. Second, SV perpetration measurement was limited to school settings and did not include all types of SV, which may have resulted in lower disclosure. Further, because the distribution for SV perpetration was irregular, we dichotomized perpetration according to whether participants endorsed any SV perpetration and thus were not able to compare trajectories in protective factors among those who report multiple instances of SV perpetration to those who report fewer and no instances of perpetration. Similarly, it is not clear whether levels of protective factors actually preceded the first instance of SV perpetration given that the AAUW inquires about perpetration over the current school year,

and because some students may have first perpetrated SV prior to when it was measured in high school. In addition, because SV perpetration was measured at similar times as protective factors (i.e., high school), it is unclear whether varying levels of protective factors contribute to SV perpetration or vice versa. Therefore, readers should be cautioned from drawing causal conclusions. Finally, more research is needed to explore the buffering roles of protective factors on SV perpetration risk.

Conclusion

This paper fills numerous gaps by adding to our understanding of potential protective factors for adolescent SV perpetration, controlling for known risk factors, and longitudinally examining changes in protective factors and their relationship to SV perpetration in high school. Significant mean differences in the levels of protective factors were detected between those who did and did not perpetrate SV in high school. The trajectories of several protective factors, including empathy, social support, and parental monitoring, also distinguished perpetrators and non-perpetrators. Together, these findings suggest that prevention efforts may be more successful at preventing SV perpetration if they start in adolescence and promote sustained levels of protective factors, involving parents and schools in a comprehensive multi-level approach.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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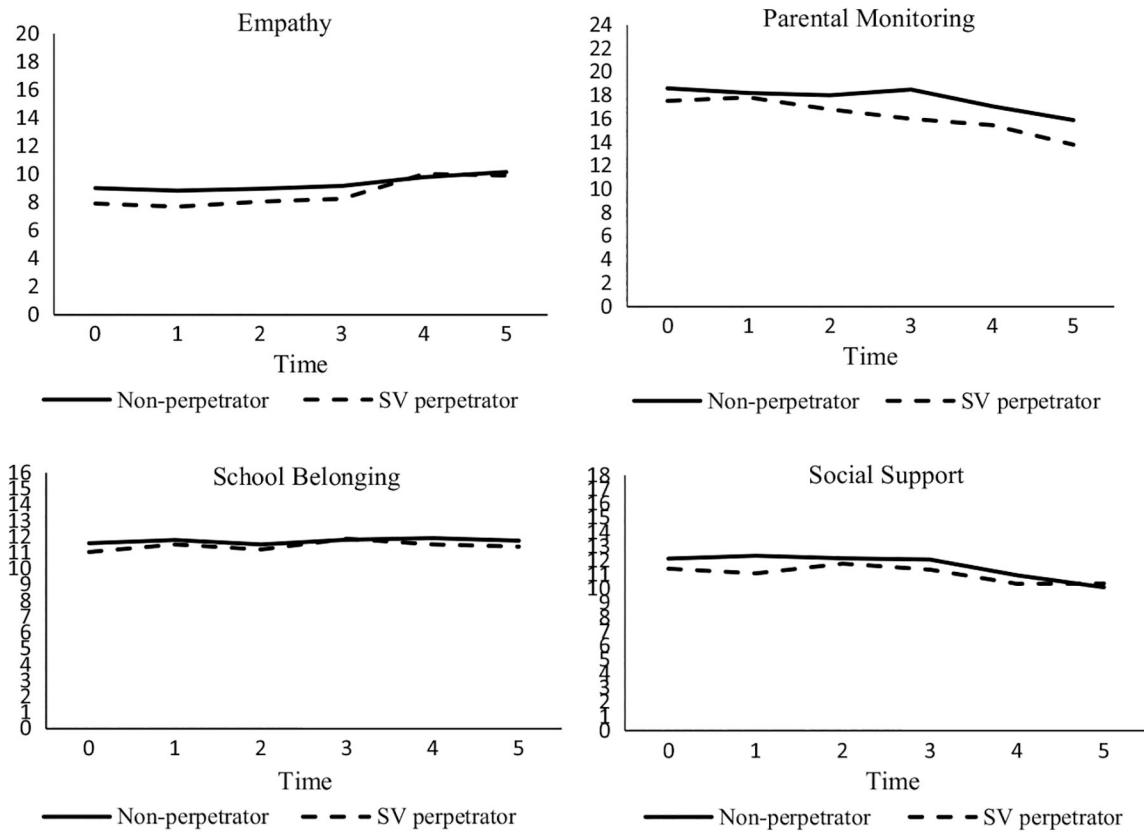


Fig. 1. Latent growth trajectories for sexual violence (SV) perpetrators and non-perpetrators for empathy, parental monitoring, school belonging, and social support (time points 0–3 are middle school, collected 6 months apart in spring and fall across 2 years, and time points 4–5 are high school, collected 1 year apart in spring across 2 years). Note: Y-axes are on different scales because the protective factor measures included a different number of items using different scales. Possible ranges of scores for each scale were as follows: empathy scores from 0 to 20, parental monitoring scores from 0 to 24, school belonging scores from 0 to 16, and social support scores from 0 to 18

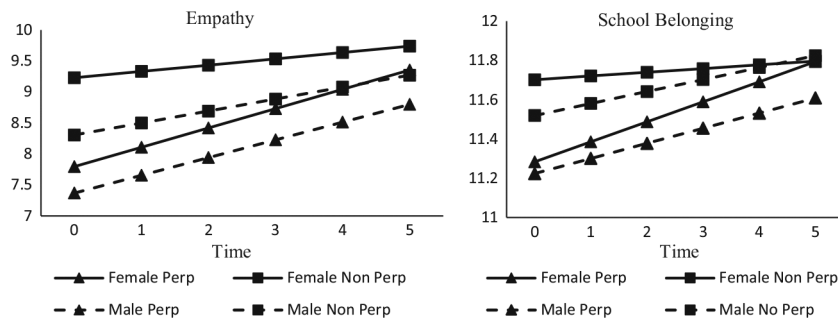


Fig. 2. Interaction between biological sex and sexual violence (SV) perpetration for empathy and school belonging (time points 0–3 are middle school, collected 6 months apart in spring and fall across 2 years, and time points 4–5 are high school, collected 1 year apart in spring across 2 years). Note: Y-axes are on different scales because the protective factor measures included a different number of items using different scales. Empathy scores ranged from 0 to 20 and school belonging scores ranged from 0 to 16

Table 1

Baseline characteristics

Variable	M (SD) or n (%), N = 3549	Female n = 1718	Male n = 1755
Demographics			
Age	12.8 (1.08)	12.7 (1.08)	12.8 (1.07)
Female n (%)	1781 (50.2)		
African-American n (%)	1638 (46.2)	839 (48.8)	796 (45.3)
White n (%)	1145 (32.2)	564 (32.8)	581 (33.1)
Multi-race n (%)	281 (7.9)	143 (8.32)	138 (7.86)
Hispanic n (%)	190 (5.4)	105 (6.11)	85 (4.84)
Asian/Pacific Islander n (%)	80 (2.3)	38 (2.21)	42 (2.39)
Mother high school education n (%) ^a	2484(70.1)	1208 (70.0)	1276 (72.7)
Risk factors			
Bullying perpetration	1.47 (0.034)	1.46 (0.34)	1.47 (0.36)
Impulsivity	1.36 (0.58)	1.36 (0.57)	1.36 (0.59)
Family violence	1.38 (0.74)	1.44 (0.78)	1.33 (0.71)
Parental violence	0.11 (0.013)	0.11 (0.13)	0.11 (0.012)
School and protective factors			
Sexual violence perpetration n (%)	718 (20.2)	299 (17.4)	419 (23.9)
School belonging	2.94 (0.595)	11.5 (1.56)	11.4(1.60)
Empathy	1.86 (0.869)	9.16(2.74)	8.33 (2.69)
Parental monitoring	2.33 (0.723)	18.7 (3.53)	17.9 (3.93)
Social support	1.35 (0.421)	12.3 (2.15)	11.7 (2.49)
Grades ^b	3.76 (1.87)	3.40 (2.20)	3.80 (2.15)

^aMothers education was coded as 1 = high school or below and 0 = more than high school

^bValues for grades are 1 = mostly A's, 2 = mostly A's and B's, 3 = mostly B's, 4 = mostly B's and C's, 5 = mostly C's, 6 = mostly C's and D's, and 7 = mostly D's and F's

Table 2

Final MG-LGCM for sexual violence (SV) perpetration for all protective factors

	Empathy	Parental monitoring ^a	School belonging ^a	Social support
SV perpetrators				
Growth parameters				
Intercept	9.04 (0.312)*	17.99 (0.103)*	12.00 (0.155)*	11.93 (0.191)*
Slope	0.105 (0.092)	-0.580 (0.029)*	-0.022 (0.046)	-0.113 (0.057)*
Variance				
Intercept	3.16 (0.322)*	6.35 (0.456)*	0.853 (0.080)*	2.40 (0.281)*
Slope	0.299 (0.028)*	0.480 (0.035)*	0.078 (0.007)*	0.232 (0.025)*
Covariance				
Intercept with slope	-0.787 (0.025)*	0.149 (0.056)*	0.057 (0.069)	-0.480 (0.055)*
SV non-perpetrators				
Growth parameters				
Intercept	10.40 (0.142)*	18.84 (0.072)*	12.14(0.070)*	12.71 (0.092)*
Slope	-0.122 (0.034)*	-0.400 (0.014)*	-0.021 (0.013)	-0.313 (0.022)*
Variance				
Intercept	6.45 (0.242)*	10.91 (0.382)*	1.56 (0.058)*	3.79(0.169)*
Slope	0.314 (0.014)*	0.276 (0.014)*	0.033 (0.002)*	0.151 (0.009)*
Covariance				
Intercept with slope	-0.882 (0.007)*	-0.176 (0.029)*	-0.340 (0.028)*	-0.584 (0.022)*

All models controlled for various risk factors and demographic characteristics including self-reported age, race, biological sex, and maternal education (high school or less as reference group), history of trauma (childhood sexual abuse, physical abuse, exposure to domestic violence), family violence (e.g., yelling, arguing, losing temper, fights by family members), substance use (alcohol, marijuana, illicit drug use), bullying (e.g., teasing, name calling, social exclusion), middle school SV perpetration, and impulsivity

* $p < .05$

^aModel fitting indicated no difference when relaxing equality constraints on intercepts and slopes. However, to test this empirically we lifted these constraints. Thus, the model results shown here have different intercepts and slopes