



HHS Public Access

Author manuscript

J Interpers Violence. Author manuscript; available in PMC 2022 February 01.

Published in final edited form as:

J Interpers Violence. 2022 February ; 37(3-4): 1514–1539. doi:10.1177/0886260520922357.

The Role of Middle School Sports Involvement in Understanding High School Sexual Violence Perpetration

Kathleen C. Basile, PhD¹, Dorothy L. Espelage, PhD², Katherine M. Ingram, MS², Thomas R. Simon, PhD¹, Faith L. Berrier, MSc¹

¹Centers for Disease Control and Prevention, Atlanta, GA, USA

²The University of North Carolina at Chapel Hill, USA

Abstract

A number of studies have examined the association between male involvement in sports and sexual violence (SV) perpetration, especially among college-age males. Less is known about the association between sports involvement and SV perpetration for adolescent males and females. To address this gap, the current study examined sports involvement in middle school (no sports, no/low contact, and high contact) among 1,561 students, who were then followed into high school and asked about the frequency of SV perpetration. Results from logistic regression models indicated that, even after controlling for mother's education, race/ethnicity, SV perpetration in middle school, and traditional beliefs about masculinity and substance use, middle school sports participation was significantly associated with risk of SV perpetration in high school. Compared with youth who reported no sports involvement in middle school, youth categorized as no/low contact sports involvement had greater odds of SV perpetration in high school. Sex differences emerged, revealing that no/low contact sports involvement was associated with SV perpetration for females and high contact sports involvement was associated with SV perpetration for males, compared with no sports involvement. These findings suggest potential opportunities to intervene in middle school to improve coaching practices, enhance respectful relationships, and modify athletes' norms, attitudes, and behaviors to reduce risk for SV perpetration in high school.

Keywords

adolescents; sexual harassment; offenders; sexual assault; prevention

Organized sports have been an important part of American culture for generations. Today, most parents encourage their children, both boys and girls, to get involved in sports from a young age, given beliefs that sports will foster positive attributes including physical fitness, confidence, social skills, and collaboration (see two recent reviews—Clark et al., 2015; Eime et al., 2013). Indeed, sports involvement has been associated with several positive youth

Article reuse guidelines: sagepub.com/journals-permissions

Corresponding Author: Kathleen C. Basile, Division of Violence Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, 4770 Buford Highway, NE, Mailstop F64, Atlanta, GA 30341, USA. kbasile@cdc.gov.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

outcomes and behaviors such as high grade point average in high school (Fox et al., 2010). Because of the cultural importance placed on sports, many people, both men and women either as spectators or players, have a positive emotional connection to sports that often begins in childhood (Bryson, 1987).

However, there may be a downside to sports involvement for some, given that athletes at various levels and from a variety of sports have historically and repeatedly been reported in the news media for allegations of rape and other forms of sexual violence (SV; e.g., Messer, 2018; Murphy, 2013; Ridpath, 2016), defined as any form of unwanted sexual contact without consent (e.g., rape, unwanted sexual touch; Basile et al., 2014). Sports involvement has been implicated in SV perpetration to such a degree that national SV prevention organizations have turned their attention to the role of sports (Raliance: Ending Sexual Violence in One Generation, 2017). Raliance, a recently formed collaborative initiative whose mission is to end SV in one generation, is focusing on understanding the role of sports in SV perpetration with the goal of leveraging sports for the prevention of SV. With these efforts underway, it is important to improve our understanding of the extent to which youth sports involvement is associated with SV perpetration.

SV is an urgent public health issue in the United States. Among U.S. high school students, 15.2% of female and 4.3% of male students reported being forced to do sexual things in the previous year (Kann et al., 2018). For many, SV begins in adolescence; 43.2% of female rape victims were first raped before their 18th birthday, and 25.9% of male victims who were made to sexually penetrate experienced it before the age of 18 years (Smith et al., 2018). In addition to penetrative acts, a nationally representative online survey of seventh- to 12th-grade students found that an estimated 56% of girls and 48% of boys reported some form of in person or online sexual harassment victimization (e.g., unwelcome comments, touching, or intimidation or force to do something sexual) during the school year, and 14% of girls and 18% of boys reported perpetrating sexual harassment against another student (Hill & Kearl, 2011). What is less clear is how and when sports involvement is related to adolescent SV perpetration.

Potential Mechanisms by Which Sports Involvement May Be Associated With SV Perpetration

The culture of organized sports (largely male) has been described as a marker of masculinity (Edley & Wetherell, 1997), one that fosters hegemonic masculinity (i.e., the practice that legitimizes the dominant societal position of men, while justifying the subordination of women and other marginalized gender identities perceived as being feminine; Connell, 2005; Messner, 2002). This phenomenon is reinforced in the team context due to dynamics like group cohesion that tend to homogenize and even polarize members' attitudes (Myers & Lamm, 1976; Rovio et al., 2009). In the context of sports teams, this means that hegemonic attitudes can become normalized across members and intensify such that individuals who held these beliefs initially now hold them more extremely (Myers & Lamm, 1976; Rovio et al., 2009). It then becomes adaptive and protective for individuals who may not have

otherwise engaged in these hegemonic attitudes and behaviors to do so (Sidanius & Pratto, 2001).

Bryson (1987) argued that masculine hegemony is constructed and reconstructed through sport by linking maleness to highly valued skills and the sanctioned use of aggression. The valuation of these qualities is evidenced in metrics such as participation opportunities (National Collegiate Athletic Association, 2012) and violent and hegemonic language norms (Adams et al., 2010). For example, for some sports, women are not allowed to play professionally (National Collegiate Athletic Association, 2012).

Furthermore, other examples that corroborate societal equation and valuation of maleness with sanctioned aggression are data on the normative use of aggressive language and homophobic slurs (Adams et al., 2010). Notably, Adams and colleagues (2010) found consistent patterns of language used by both coaches and players in a semiprofessional athletic league that included violent content (including explicit and graphic sexually violent language referring to “raping” the opponent). They also found consistent use of homophobic slurs that equate weakness with nonheterosexual identities.

In addition to understanding sports involvement in the context of hegemonic masculinity, social learning theory of aggression (Bandura, 1978) may provide some insights. This theory suggests that attitudes and behaviors of adolescent athletes who admire both professional athletes and their own coaches are likely influenced by them. For example, Guivernau and Duda (2002) found that adolescent soccer players (boys and girls) were significantly more likely to report that they would hypothetically engage in aggression on the field if they believed their coach would condone it.

Evidence suggests that these norms of hegemonic masculinity and lessons learned that are reinforced in the locker rooms and sports fields may also be applied outside the sports context. For example, in a qualitative observational study of male athletes in bars, Curry (2000) found that the masculine ideology enforced on sports teams and in locker rooms was associated with more aggression in the bars. In addition, Gage (2008) found that male college athletes (compared with male college nonathletes) reported less positive attitudes toward women and higher scores on a measure of traditional masculinity. Other work has linked these attitudes closely to sexual and gender violence perpetration (see for review, McDermott et al., 2015). Importantly, Koss and Cleveland (1996) pointed out that, given available methodologies, there is a possibility that individuals who are already at risk of perpetrating SV (based on these identified attitudes) self-select into organizations such as organized sports. While we can recognize aspects of these organizations that maintain masculine hegemony, we must also consider the role of self-selection and individual predisposition to perpetration.

To our knowledge, no scholarship has focused on female sports involvement and its association to SV perpetration, so theoretical frameworks explaining the potential relevance for female youth do not exist. It could be that some of the factors explaining SV perpetration in general, like anger, general aggression, pro-violence attitudes, and alcohol use (Tharp et al., 2013) may be higher in female athletes than female nonathletes, making them more at

risk of SV perpetration. However, it could be that no association exists for girls between sports involvement and SV perpetration, given girls' behaviors may not be impacted by attitudes about hegemonic masculinity in the same way that boys' are, as female athletes tend to face different pressures, such as maintaining femininity and sexual allure, to avoid homophobic epithets and maintain popularity (Krane et al., 2004).

Previous Literature Linking Sports Involvement to SV Perpetration

A number of studies have examined the association between male involvement in sports and perpetration of SV (e.g., Gage, 2008; Humphrey & Kahn, 2000; Koss & Gaines, 1993; Lackie & de Man, 1997; Locke & Mahalik, 2005) and results have been mixed. A weakness of this scholarship is that most studies have focused on male college samples, limiting our understanding of patterns among female and adolescent athletes. Many of these studies also examined the role of attitudes toward women and violence in the sports–SV association. For example, Koss and Gaines (1993) studied college males' degree of involvement in sports (scale from 0 = *no involvement* to 4 = *varsity football or basketball*), among other factors, and found that although reported nicotine use and intensive alcohol use were the strongest predictors, hostility toward women and higher degree of sports involvement (i.e., revenue-producing sports) were associated with SV perpetration. A more recent study by Gage (2008) examined the college-level male *center* sport of football versus *marginal* sports of tennis and track and field. Gage (2008) summarized Messner's (2002) definition of *center* sports as "those with long traditions within collegiate structures, where norms of masculinity have been entrenched" (Gage, 2008, p. 1017) and *marginal* sports are sports less valued by institutions. Gage (2008) found that males who participated in football, a center sport, scored higher on hypermasculinity scales and other negative attitudes toward women and reported more sexual aggression than males who were involved in marginal or no sports. As suggested by the Gage (2008) study, the type of sport seems to matter in understanding sport's association with SV perpetration. Gage (2008) argued that research should not only examine sports involvement versus no sports involvement broadly, but rather, attend to the important differences between types of sports, such as differing contact levels. Only some of the previous scholarship has focused on the type of sport (Gage, 2008; Humphrey & Kahn, 2000; Koss & Gaines, 1993; McCauley et al., 2014).

Other studies found no association between sports involvement and SV perpetration. Lackie and de Man (1997), in a study of 86 college males, found that physical aggression, sex role stereotyping, and fraternity affiliation were associated with SV perpetration, but that sports involvement was not. Locke and Mahalik (2005), in their study of 254 college males, found that problematic alcohol use and masculine norms were the strongest predictors of sexual aggression, but that participation in athletics was not associated. Little is known about the association of sports involvement and SV among adolescents; however, a study by Miller and colleagues (1998) may be instructive. Although this study did not examine SV, the authors found that male athletes began having sex earlier and had more partners than male nonathletes. These behaviors have been linked with SV perpetration in other research (Salazar et al., 2018). Female athletes had significantly lower reports of sexual activity than female nonathletes. We might conclude from the Miller and colleagues (1998) study that, given female sports involvement was not associated with any negative sexual behaviors they

measured (e.g., early sex initiation), girls' sports involvement may not be as much of a risk factor for SV perpetration as it is for boys.

One reason why research has been mixed on the association between sports involvement and SV perpetration could be because it has not accounted for other important factors involved in this association. For example, a few studies (Gage, 2008; Humphrey & Kahn, 2000; Koss & Gaines, 1993) have examined traditional masculinity or hostile attitudes toward women among male athletes and have often found associations with both sports involvement and SV perpetration, suggesting that these kinds of attitudes should be accounted for in examining the connection between sports involvement and SV perpetration. Also, alcohol use is associated with both sports involvement (Kwan et al., 2014; Taliaferro et al., 2010) and SV perpetration (Tharp et al., 2013). This scholarship generally suggests that traditional beliefs about masculinity and alcohol use may be key in explaining the sports–SV association.

The Current Study

This article fills gaps by expanding the understanding of type of sport by examining (across middle school) three categories of sports participation (no sports, no contact/low contact, and high contact) and its association with SV perpetration by male and female high school students while controlling for middle school SV perpetration, alcohol use, drug use, traditional masculinity attitudes, and demographic variables. Based on theory and previous literature, we hypothesized as follows:

Hypothesis 1: Participation in high contact sports will be associated with increased risk for SV perpetration.

Hypothesis 2: When stratified by sex, boys who participate in high contact sports will be at increased risk for SV perpetration and no significant association will be found for girls.

Method

Participants

Participants included 1,561 students from four Midwestern middle schools who were followed in this study into six high schools. New students were enrolled at each wave and students may not have been surveyed at some waves because of moving to another school or being chronically absent. Students in this data set had to have data on the SV perpetration items at one of the high school waves. Response rates ranged from 92% to 95% at each wave. Surveys were administered across six time points (waves): Spring/Fall 2008; Spring/Fall 2009, Spring 2012, and Spring 2013. High school students were surveyed once a year (spring) to capture greater variability in SV. At baseline, the sample was 37.1% non-Hispanic White, 47.2% non-Hispanic African American, 3.2% Hispanic, and 12.5% other. The sample was 49.5% female. At baseline, students were in fifth (4.1%), sixth (32.6%), seventh (34.4%), or eighth (28.9%) grade. In Wave 6, participants in the sample included freshmen, sophomores, juniors, or seniors (contributed data only in 2012—Wave 5) in high school. During high school, 13.1% of participants (14.6% of males and 11.6% of

females) reported engaging in SV perpetration. See Table 1 for more information on basic demographics.

Procedures

This study was approved by the University of Illinois institutional review board and the school districts. A waiver of active consent was approved. Parents received study information and consent forms prior to data collection and returned the signed consent form if they did not wish their child to participate in the survey. Trained proctors described the study, obtained student assent or documented their decision to opt out, and read the 30-min survey aloud while students completed the middle school survey (Waves 1–4). High school students completed computer-based surveys (Waves 5–6). At each wave, all student participants were provided resources (e.g., websites, hotlines) in case they had concerns with the survey content.

Measures

Demographic and control variables.—Participants were asked to self-report their race and ethnicity and were given six options: African American (not Hispanic), Asian, White (not Hispanic), Hispanic, Native American, or Pacific Islander. Students could mark all that applied. Other demographic control variables were self-reported sex (female reference) and maternal education (more than high school reference). In addition to basic demographic variables, we also controlled for middle school SV perpetration, middle school alcohol/cigarette use (How often, in the past year, did you drink beer? Did you drink wine or wine coolers? Have you been drunk? Did you smoke cigarettes? Response options range from 0 [*never*] to 4 [*10 or more times*], α s range = .73 to .85, Waves 1–4), middle school drug use (How often, in the past year, did you use marijuana? Did you use inhalants? Did you use other drugs? Response options range from 0 [*never*] to 4 [*10 or more times*], α s range = .61 to .66, Waves 1–4), high school alcohol use (items for the following: In the past month, how many days did you have one full drink of alcohol? Did you have five or more drinks? Response options range from 0 [*0 days*] to 7 [*20–30 days*], r s = .84, .88 for Waves 5–6), and high school drug use (In the past month, how many days did you use marijuana? Did you use another illegal drug or pill to get high? Response options range from 0 [*0 days*] to 7 [*20–30 days*], r s = .43 for Waves 5–6); and middle school traditional masculinity attitudes. Alcohol and drug items were summed into scales and then each of the four scales were dichotomized into 0 (*no use*) and 1 (*any report of use*). Waves 1 to 4 were combined for middle school variables and Waves 5 to 6 for high school variables. Traditional masculinity was measured using the continuous seven-item traditional masculinity scale of the Adolescent Masculinity Ideology in Relationships Scale (AMIRS; Chu et al., 2005), which assesses the level of traditional masculinity attitudes held by an individual. It can be used to assess traditional masculinity attitudes for both males and females. One example item is as follows: “It’s important for a boy to act like nothing is wrong, even when something is bothering him.” Response options included *strongly disagree*, *disagree*, *agree*, and *strongly agree* on a 4-point Likert-type scale (1–4). Cronbach’s alpha coefficients ranged from .76 to .82 in Waves 1 to 4.

Middle school sports involvement.—Students were asked whether they participated in sports at school during the semester of the survey. Those who answered “yes” were asked to indicate which sports they played. Options listed were baseball, basketball, football, hockey, soccer, and other. Those who answered “other” were asked to specify which sport(s). A variable was then created for every sport listed in the “other” box, such that participation in these sports could be assessed over time, identical to the original options listed. Adapted from the contact-related categories proposed by the American Academy of Pediatrics Committee on Sports Medicine and Fitness (AAP; 2001), we initially created four categories by which to group the sports: (a) no sports involvement, (b) no contact sports (i.e., no contact with opposing team; badminton, biking, croquet, golf, horseback riding, jump rope, rock climbing, rowing crew, skiing, swimming, tennis, and track/cross-country running), (c) low contact sports (i.e., contact with members of an opposing team is minimal; dance, cheerleading, dodgeball, figure skating, gymnastics/acrobatics, kickball, volleyball, softball, fencing, baseball, and field hockey), and (d) high contact sports (i.e., contact is mainly with opposing team members; basketball, football, ice hockey, lacrosse, soccer, wrestling, and martial arts). Our categories were informed by the work of AAP Committee on Sports Medicine and Fitness (2001), but the current study created categories related to aggression rather than head injury in sport, so the sport categorizations differ slightly from AAP (e.g., field hockey is considered high contact by AAP). In cases where a student participated in sports spanning several categories during the measurement period, the highest contact category was used. Prevalence of each category of sports involvement for this sample can be found in Table 1. Given the low prevalence of no contact sports involvement in this sample ($n = 97$), we combined the no contact and low contact categories in the logistic regression analyses.

Middle and high school SV perpetration.—An abbreviated six-item version of the American Association of University Women (AAUW) Sexual Harassment Survey was used to assess SV perpetration in middle school (Waves 1–4; control variables) and high school (Waves 5–6; Hill & Kearl, 2011; Rinehart et al., 2017). Students were asked, “*During this school year, did you do any of the following to other students at school when they did not want you to?*” Participants were presented with six items assessing unwanted sexual harassment (i.e., sexual comments, sexual rumor spreading, and showing sexual pictures) and forced sexual contact (i.e., touching in a sexual way, physically intimidating in a sexual way, and forcing to do something sexual). Response options were *never, 1 or 2 times, 3 or 4 times, 5 or 6 times, and 7 or more times* on a 5-point Likert-type scale (0–4). This scale has demonstrated strong construct validity through exploratory and confirmatory factor analysis (Espelage et al., 2018). Cronbach’s alpha coefficients ranged from .68 to .73 for middle school waves and .62 and .67 for the two high school waves, respectively. Because the distribution for perpetration was heavily skewed, it was dichotomized into (a) *any report* of engaging in SV perpetration, or (b) *no report* of engaging in SV perpetration during middle school (Waves 1–4) and during high school (Waves 5–6).

Data Analytic Plan

First, odds ratios for associations of all independent variables and SV perpetration in high school were examined. To test our hypotheses, we estimated a series of logistic

regression models. We estimated a basic logistic regression model predicting the odds of engaging in SV in high school. Here, we entered our variables into the model in a stepwise fashion. In the first model, we entered demographic variables (biological sex, race/ethnicity, and mother's education). In the second model, we entered middle school control variables (SV perpetration, alcohol/cigarette use, drug use, and traditional masculinity attitudes). In the third model, we entered the high school control variables (alcohol and drug use in high school). In the final model, we entered our nominal middle school sports involvement variable. Results are in reference to individuals who *do not report any* sports involvement during middle school. Next, to understand whether the association between sports involvement and SV perpetration varies by biological sex, we estimated a series of multigroup logistic regression models. To do this, we used the KNOWNCLASS option in *Mplus* (Muthén & Muthén, 1998–2017) to estimate multigroup mixture models, which uses a Monte Carlo integration algorithm to estimate the odds of SV perpetration stratified by sex. The same control variables were used in the stepwise fashion described above (with the exception of biological sex). We allowed all variables to vary between males and females, using *no sports involvement* as the reference group.

Missing Data

Missing data ranged from 4% to 25% across the study period for all variables with the exception of high school alcohol and drug use, where 59% of the participants were missing data. We used full information maximum likelihood (FIML) estimator in *Mplus* 8 (Muthén & Muthén, 1999–2017). FIML treats all observed predictors as a single-item latent variable; therefore, each individual contributes data they have available at each wave to the likelihood function and no individuals are removed from the analysis through listwise deletion. Under the assumption that data are missing at random (MAR), or are conditionally random after adjusting for other variables in the model (missing completely at random [MCAR]), estimates and *SEs* are unbiased by the missing data (Enders, 2010). Attrition has been assessed in multiple articles from this data set (see Davis, Merrin, et al., 2019; Davis, Ports, et al., 2019). Few differences existed across variables of interest across participant demographics. Thus, with the modest amount of missing data, coupled with the large sample size, and the use of covariates in the data analysis, it is likely that missing data had a small effect on model estimates.

Results

Table 2 presents odds ratios for associations of all independent variables and SV perpetration in high school. Of the key risk factors, SV perpetration in middle school, drug use in high school, and traditional masculinity attitudes in middle school were associated with increased odds of SV perpetration in high school. Participation in high contact sports in middle school also increased the odds of high school SV perpetration.

Basic Logistic Regression

Models 1 to 3 in the main effects regression analysis (Table 3) reveal that racial/ethnic minority status and SV perpetration in middle school were associated with increased odds of SV perpetration in high school. Model 4 presents the main effects of middle school

sports involvement predicting odds of SV perpetration in high school. Results indicated that, compared with youth who reported *no sports* involvement in middle school, youth categorized as *no/low contact* sports involvement had twice the odds (adjusted odds ratio [AOR] = 2.08, 95% confidence interval [CI] = [1.30, 3.33]) of SV perpetration in high school. Racial/ethnic minority status remained associated with higher odds of high school SV perpetration. No other covariates predicted high school SV perpetration in the final model.

Multigroup Logistic Regression: Stratification by Sex

Table 4 presents main effects of the multigroup mixture model, estimating the effects of middle school sports involvement on high school SV perpetration stratified by sex. As shown, in the male Models 1 to 3, racial/ethnic minority status was significantly related to increased odds of SV perpetration in high school, and SV in middle school was significantly related to increased odds of high school SV perpetration in Models 2 to 3. In male Model 4, compared with those who reported *no sports* involvement, males who were categorized as involved in *high contact* sports had higher odds (AOR = 1.89, 95% CI = [1.13, 3.15]) of SV perpetration. We did not find an effect for *no/low contact* sports involvement predicting SV perpetration for males. Racial/ethnic minority status was also associated with increased odds of SV perpetration for males (AOR = 2.20, 95% CI = [1.30, 3.74]) in the final model. For females, in Models 1 to 3, racial/ethnic minority status was significantly related to increased odds of SV perpetration in high school, and traditional masculinity was significantly related to increased odds of high school SV perpetration in Models 2 to 3. In Model 4, *no/low contact* sports involvement was associated with increased odds of SV perpetration (AOR = 2.10, 95% CI = [1.15, 3.83]). Racial/ethnic minority status (AOR = 2.58, 95% CI = [1.44, 4.63]) and traditional masculinity (AOR = 2.00, 95% CI = [1.06, 3.76]) remained significant in the final female model.

Discussion

In this longitudinal study of early adolescents followed from middle school to high school, sports involvement in no or low contact sports in middle school was associated with greater risk of SV perpetration in high school. However, in sex-stratified models, the effect differed such that high contact sports involvement of males was associated with greater SV perpetration and no/low contact sports involvement of females was associated with greater SV perpetration. These findings suggest that SV perpetration prevention could potentially benefit from early efforts to address attitudes and behaviors related to male and female youth sports involvement in middle school. This study addresses major gaps in the literature by focusing on early adolescents rather than college athletes, examining the association between sports involvement (and level of contact) and SV perpetration among both sexes, and controlling for potential confounders.

As expected, the association between participation in high contact sports in middle school and SV perpetration in high school was significant for males after controlling for key risk factors for SV perpetration in high school—namely, substance use in middle school and high school and traditional masculinity and SV perpetration in middle school. Koss

and Cleveland (1996) suggested that individuals who are already at risk of perpetrating SV (based on negative attitudes toward women and other key risk factors) may self-select into organizations such as organized sports or fraternities, so it could be that they were predisposed to SV perpetration before their involvement in sports. However, the current findings suggest that the link between participation in high contact sports and SV perpetration observed for males may not be due to aggressive youth or those with traditional beliefs about masculinity selecting contact sports. Findings suggest that when accounting for high contact sports involvement and other factors, some of the key risk factors found in previous research (e.g., substance use, attitudes, and prior SV perpetration) become less important in understanding SV perpetration in high school. High contact sports participation in middle school and racial/ethnic minority status were the only significant predictors of male high school SV perpetration in the final model, suggesting that the effects of high contact sports may be more salient in this sample than the links with other key risk factors.

Contrary to our hypothesis, female middle school students who participated in sports with no/low contact were at increased risk for SV perpetration in high school. If replicated in other research, the mechanism underlying this association requires further investigation to understand the implications for prevention. For example, it will be important to understand the context of the SV perpetration and the extent to which young females who are active in these sports are more likely to be exposed to situations that contribute to risk for perpetration and victimization (e.g., earlier sexual activity or more dating partners). Data used in this article reveal that unwelcome sexual comments are the most commonly endorsed SV perpetration for girls (and boys; Espelage et al., 2016). This kind of banter is probably happening against the same and opposite sexes, and warrants further study to see how this is manifesting for girls participating in no/low contact sports. The SV perpetration questions used in this analysis referred to perpetration “at school” and some of this could be during sports participation. Sports participation might provide an opportunity for this type of banter. Additional research is needed to understand the extent to which sexual banter and other SV behaviors are occurring in the context of sports participation (e.g., against rivals or teammates) versus outside of sports. Understanding these and other differences in SV perpetration by the sex of the perpetrator and victim could inform prevention efforts. In addition, the data reveal that the most commonly endorsed no/low contact sports for girls are volleyball and cheerleading (both low contact, data not shown). It may be worthwhile to investigate these particular sports and their association with SV perpetration in future research with girls.

Rather than suggesting that high risk youth choose contact sports or that young athletes are at risk of SV perpetration because they also endorse a large number of other risk factors, these findings are consistent with the social learning theory explanation for a link between contact sports participation and SV perpetration. Male and female athletes in contact sports are possibly influenced by their coaches and others in the sports arena whom they admire. The role of traditional masculinity in this link requires further examination. The results did show a significant association between beliefs supportive of traditional masculinity in middle school and SV perpetration in high school in adjusted models, but only for girls. This was not expected, given previous theory and research linking males’ attitudes to aggression, and because in previous analysis with these data, traditional masculinity attitudes of boys

were associated with later SV perpetration (Birkett & Espelage, 2015). For traditional masculinity as well as the other risk factors controlled for in this study, it could be that in the context of sports involvement, where the culture of a team might homogenize attitudes (Myers & Lamm, 1976; Rovio et al., 2009), personal views on traditional masculinity, previous or current substance use, and previous SV perpetration may become less important in explaining the relationship with high school SV perpetration. However, the lack of association between middle school SV perpetration and high school SV perpetration in the final model was not expected, especially in the male model, as prior SV perpetration has been a potent risk factor for later SV perpetration in other studies (Tharp et al., 2013). It might be that the inclusion of numerous covariates suppressed the effect of this and other covariates. Future research is warranted to better understand the role of key SV risk factors when contact sports involvement is present.

Regarding racial disparities in perpetration among boys and girls, the external validity of this finding is unclear as it has not been found in the greater literature and there are methodological limitations (e.g., dichotomized race). Also, contextual dynamics must be considered in understanding these data. First, youth of color represent a highly victimized group across sexual and other violent contexts (Kann et al., 2018; West, 2014). Several researchers have identified pathways whereby systemic social, political, and economic disparities give rise to elevated rates of violence (James et al., 2003; Sanders-Phillips, 2009; Williams & Mohammed, 2013). There is also research to suggest that exposure to violent stereotypes about oneself may be internalized such that they are more readily accessed, reported as self-attributions, or acted upon (Bryant, 2011). The current finding of greater perpetration by racial/ethnic minority boys and girls (largely African American) may be capturing symptoms of the social context where youth of color face significant disparities (West, 2014; Williams & Mohammed, 2013).

Some limitations are worth noting. First, although the sample was diverse, participants were from one region of the country (the Midwest), which limits generalizability. Second, the measures of SV were limited to SV of “students at school,” so this study is likely underestimating the prevalence of SV perpetration in this sample. Third, the analysis used mutually exclusive nominal categories to reflect sports participation. Fourth, some of the CIs in the results were wide, particularly for the sex-stratified model, suggesting that this analysis may have lacked the power to detect associations between sports involvement and SV perpetration. Future studies with larger sample sizes and additional measures of SV perpetration to increase disclosure would be beneficial to replicate these findings. Future longitudinal studies that can examine further what came first—sports involvement or other risk factors for SV perpetration (e.g., traditional masculinity attitudes, substance use) would be helpful. Ideally, additional research will identify when and for whom sports participation is protective against SV perpetration. These insights may be useful to inform prevention.

Adolescent sports participation has numerous positive impacts as described in the literature (Clark et al., 2015; Eime et al., 2013); but along with the benefits, there may be some risks associated with certain kinds of sports involvement. This research provides additional evidence that adolescent involvement in contact sports, specifically no/low contact sports participation of girls and high contact sports participation of boys, is associated with

later SV perpetration, even when controlling for potent SV perpetration risk factors. Therefore, adolescent sports teams may be a useful context for violence prevention efforts. As recognized in Centers for Disease Control and Prevention's (CDC) *STOP SV: A Technical Package to Prevent Sexual Violence*, approaches that mobilize men and boys commonly operate by having adults mentor youth to foster healthy norms about masculinity, gender, and violence and the youth spreading these norms throughout their social networks (Basile et al., 2016). Sports teams are an ideal setting for this kind of norms change. Indeed, leveraging sports to prevent violence has already been adopted by the developers of *Coaching Boys Into Men* (CBIM), an adolescent violence prevention program that trains coaches of adolescent male athletes to promote and model respectful, nonviolent relationships with their athletes. CBIM has been found to be effective in reducing adolescent dating violence by male high school and middle school athletes (Miller et al., 2012, 2013, 2020). More research exploring whether CBIM is effective in preventing adolescent SV perpetration outside of the dating context, and whether a similar SV prevention model can be effective with female athletes, would be important contributions. This study suggests that intervening early, in middle school or before, may be most helpful to impact factors associated with later SV perpetration.

SV perpetration is a complex problem with multiple risk factors (Tharp et al., 2013). More research is needed to better understand the developmental factors that contribute to SV perpetration, with attention to the role of sports—both in perpetuating risk and in providing an opportunity for protection and prevention. This study provides additional support for the potential utility of leveraging sports for good (Raliance: Ending Sexual Violence in One Generation, 2017). Leveraging sports in prevention efforts may enable youth to reap the benefits from sports and avoid the negative aspects.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Middle school data in this article were drawn from a grant from the Centers for Disease Control and Prevention (CDC; 1U01/CE001677) to Dorothy Espelage (PI). High school data in this article were drawn from a grant from the National Institute of Justice (Grant number 2011-90948-IL-IJ) to Dorothy Espelage (PI). Analyses and article preparation was supported through an inter-personnel agency agreement (IPA) between University of Florida (Espelage) and the CDC (17IPA1706096). The findings and conclusions in this article are those of the authors and do not necessarily represent the official position of the CDC.

Author Biographies

Kathleen C. Basile, PhD, is a senior scientist in the Division of Violence Prevention at CDC, where she has been since 2000. Her research interests are measurement, prevalence, risk and protective factors, and health consequences of sexual violence and intimate partner violence. She received her MA and PhD degrees in sociology from the Georgia State University.

Dorothy L. Espelage, PhD, is the William C. Friday Professor of Education in the School of Education at the University of North Carolina at Chapel Hill. Her main research interests are prevention of youth bullying, sexual violence, and school safety promotion. She received her PhD degree in counseling psychology from Indiana University.

Katherine M. Ingram, MS, is a PhD student in school psychology at the University of North Carolina at Chapel Hill. Her research focuses on school-based approaches to preventing sexual and dating violence, and promoting wellness among adolescents.

Thomas R. Simon, PhD, is the associate director for science in the Division of Violence Prevention at CDC. He received his PhD in preventive medicine from the University of Southern California's School of Medicine. His work focuses on violence involving youth and how changes in prevention strategies and policies can reduce risk for multiple types of violence at the population level.

Faith L. Berrier, MSc, is a health scientist in the Division of Violence Prevention at CDC. Her research interests include evidence-based intervention program design and implementation, and the prevention of sexual violence, including risk and protective factors at different levels of the social ecology. She received her MSc degree in health, community, and development from the London School of Economics.

References

- Adams A, Anderson E, & McCormack M (2010). Establishing and challenging masculinity: The influence of gendered discourses in organized sport. *Journal of Language and Social Psychology*, 29(3), 278–300.
- American Academy of Pediatrics Committee on Sports Medicine and Fitness. (2001). Medical conditions affecting sports participation. *Pediatrics*, 1075(5), 1205–1209. 10.1542/peds.107.5.1205
- Bandura A (1978). Social learning theory of aggression. *Journal of Communication*, 28(3), 12–29.
- Basile KC, DeGue S, Jones K, Freire K, Dills J, Smith SG, & Raiford JL (2016). STOP SV: A technical package to prevent sexual violence. National Center for Injury Prevention and Control, Centers for Disease Control and Prevention.
- Basile KC, Smith SG, Breiding MJ, Black MC, & Mahendra RR (2014). *Sexual violence surveillance: Uniform definitions and recommended data elements* (Version 2.0). National Center for Injury Prevention and Control, Centers for Disease Control and Prevention.
- Birkett M, & Espelage DL (2015). Homophobic name-calling, peer-groups, and masculinity: The socialization of homophobic behavior in adolescents. *Social Development*, 24(1), 184–205. 10.1111/sode.12085
- Bryant WW (2011). Internalized racism's association with African American male youth's propensity for violence. *Journal of Black Studies*, 42(4), 690–707. [PubMed: 21910273]
- Bryson L (1987). Sport and the maintenance of masculine hegemony. *Women's Studies International Forum*, 10(4), 349–360.
- Chu JY, Porche MV, & Tolman DL (2005). The Adolescent Masculinity Ideology in Relationships Scale: Development and validation of a new measure for boys. *Men and Masculinities*, 8(1), 93–115. 10.1177/1097184X03257453
- Clark HJ, Camiré M, Wade TJ, & Cairney J (2015). Sport participation and its association with social and psychological factors known to predict substance use and abuse among youth: A scoping review of the literature. *International Review of Sport and Exercise Psychology*, 81(1), 224–250.
- Connell RW (2005). *Masculinities* (2nd ed.). University of California Press.
- Curry TJ (2000). Booze and bar fights: A journey to the dark side of college athletics. In McKay J, Messner MA, & Sabo D (Eds.), *Masculinities, gender relations and sport* (pp. 162–175). SAGE.
- Davis JP, Merrin GJ, Ingram KM, Espelage DL, Valido A, & El Sheikh A (2019). Examining pathways between bully victimization, depression, & school belonging among early adolescents. *Journal of Child and Family Studies*, 28(9), 2365–2378.
- Davis JP, Ports KA, Basile KC, David-Ferdon CF, & Espelage DL (2019). Understanding the buffering effects of protective factors on the relationship between adverse childhood experiences and teen

- dating violence perpetration. *Journal of Youth and Adolescence*, 48(12), 2343–2359. [PubMed: 31041619]
- Edley N, & Wetherell M (1997). Jockeying for position: The construction of masculine identities. *Discourse & Society*, 8(2), 203–217.
- Eime RM, Young JA, Harvey JT, Charity MJ, & Payne WR (2013). A systematic review of the psychological and social benefits of participation in sport for children and adolescents: Informing development of a conceptual model of health through sport. *International Journal of Behavioral Nutrition and Physical Activity*, 10(1), Article 98.
- Enders CK (2010). *Applied missing data analysis*. Guilford Press.
- Espelage DL, Basile KC, Leemis R, Hipp T, & Davis J (2018). Longitudinal examination of the bullying-sexual violence pathway across early to late adolescence: Implicating homophobic name-calling. *Journal of Youth and Adolescence*, 47(9), 1880–1893. 10.1007/s10964-018-0827-4 [PubMed: 29500577]
- Espelage DL, Hong JS, Rinehart S, & Doshi N (2016). Understanding the themes, locations, & perpetrators of peer-to-peer sexual harassment in middle school: A focus on sex, racial, and grade differences. *Children and Youth Services Review*, 71, 174–183. 10.1016/j.childyouth.2016.11.010
- Fox CK, Barr-Anderson D, Neumark-Sztainer D, & Wall M (2010). Physical activity and sports team participation: Associations with academic outcomes in middle school and high school students. *Journal of School Health*, 80(1), 31–37.
- Gage E (2008). Gender attitudes and sexual behaviors. *Violence Against Women*, 14(9), 1014–1032. [PubMed: 18703773]
- Guivernau M, & Duda JL (2002). Moral atmosphere and athletic aggressive tendencies in young soccer players. *Journal of Moral Education*, 31(1), 67–85.
- Hill C, & Kears H (2011). *Crossing the line: Sexual harassment at school*. American Association of University Women.
- Humphrey SE, & Kahn AS (2000). Fraternities, athletic teams, and rape. *Journal of Interpersonal Violence*, 15(2), 1313–1322.
- James SE, Johnson J, Raghavan C, Lemos T, Barakett M, & Woolis D (2003). The violent matrix: A study of structural, interpersonal, and intrapersonal violence among a sample of poor women. *American Journal of Community Psychology*, 31(1–2), 129–141. [PubMed: 12741695]
- Kann L, McManus T, Harris WA, Shanklin SL, Flint KH, Queen B, Lowry R, Chyen D, Whittle L, Thornton J, Lim C, Bradford D, Yamakawa Y, Leon M, Brener N, & Ethier KA (2018). Youth risk behavior surveillance: United States, 2017. *Morbidity and Mortality Weekly Report Surveillance Summaries*, 67(8), 1–114. 10.15585/mmwr.ss6708a1
- Koss MP, & Cleveland HH (1996). Athletic participation, fraternity membership, and date rape: The question remains-self-selection or different causal processes? *Violence Against Women*, 2(2), 180–190. [PubMed: 12295458]
- Koss MP, & Gaines JA (1993). The prediction of sexual aggression by alcohol use, athletic participation, and fraternity affiliation. *Journal of Interpersonal Violence*, 8(1), 94–108. 10.1177/088626093008001007
- Krane V, Choi PYL, Baird SM, Aymar CM, & Kauer KJ (2004). Living the paradox: Female athletes negotiate femininity and muscularity. *Sex Roles*, 50, 315–329.
- Kwan M, Bobko S, Faulkner G, Donnelly P, & Cairney J (2014). Sport participation and alcohol and illicit drug use in adolescents and young adults: A systematic review of longitudinal studies. *Addictive Behavior*, 39(3), 497–506.
- Lackie L, & de Man AF (1997). Correlates of sexual aggression among male university students. *Sex Roles*, 37(5–6), 451–457.
- Locke BD, & Mahalik JR (2005). Examining masculinity norms, problem drinking, and athletic involvement as predictors of sexual aggression in college men. *Journal of Counseling Psychology*, 52(3), 279–283.
- McCauley HL, Jaime MCD, Tancredi DJ, Silverman JG, Decker MR, Austin SB, & Miller E (2014). Differences in adolescent relationship abuse perpetration and gender-inequitable attitudes by sport among male high school athletes. *Journal of Adolescent Health*, 54(6), 742–744.

- McDermott RC, Kilmartin C, McKelvey DK, & Kridel MM (2015). College male sexual assault of women and the psychology of men: Past, present, and future directions for research. *Psychology of Men & Masculinity*, 16(4), 355–366.
- Messer O (2018, February 9). High-school coach “ignored” boy’s screams as teammates raped him, lawsuit claims. *Daily Beast*. <https://amp.flipboard.com/@amberino123/crime-0f092170z/high-school-coach-ignored-boy-s-screams-as-teammates-raped-him-lawsuit-claims/a-aUaIbbyZRRKEEAiyFAtuFQ%3Aa%3A42682266-1970d54008%2Fthedailybeast.com>
- Messner MA (2002). *Taking the field: Women, men, and sports*. University of Minnesota Press.
- Miller E, Jones KA, Ripper L, Paglisotti T, Mulbah P, & Abebe KZ (2020). An athletic coach-delivered middle school gender violence prevention program: A cluster randomized clinical trial. *Journal of the American Medical Association Pediatrics*, 174(3), 241–249. 10.1001/jamapediatrics.2019.5217 [PubMed: 31930358]
- Miller E, Tancredi DJ, McCauley HL, Decker MR, Virata MCD, Anderson HA, O’Connor B, & Silverman JG (2013). One-year follow-up of a coach-delivered dating violence prevention program: A cluster randomized controlled trial. *American Journal of Preventive Medicine*, 45(1), 108–112. [PubMed: 23790995]
- Miller E, Tancredi DJ, McCauley HL, Decker MR, Virata MC, Anderson HA, Stetkevich N, Brown EW, Moideen F, & Silverman JG (2012). “Coaching boys into men”: A cluster-randomized controlled trial of a dating violence prevention program. *Journal of Adolescent Health*, 51(5), 431–438.
- Miller KE, Sabo DF, Farrell MP, Barnes GM, & Melnick MJ (1998). Athletic participation and sexual behavior in adolescence: The different worlds of boys and girls. *Journal of Health and Social Behavior*, 39(2), 108–123.
- Murphy T (2013, December 5). 40 years of college football’s sexual-assault problem: The case of FSU’s Jameis Winston highlights a long and ugly history of universities dropping the ball on rape allegations. *Mother Jones*. <https://www.mother-jones.com/politics/2013/12/college-football-sexual-assault-jameis-winston/>
- Muthén LK, & Muthén BO (1998–2017). *Mplus User’s Guide*.
- Myers DG, & Lamm H (1976). The group polarization phenomenon. *Psychological Bulletin*, 83(4), 602–627.
- National Collegiate Athletic Association. (2012, January). NCAA® Gender-equity report. <http://www.ncaapublications.com/productdownloads/GEQS10.pdf>
- Raliane: Ending Sexual Violence in One Generation. (2017). How sport can end sexual violence in one generation. Raliane.
- Ridpath BD (2016, September 15). The attitude toward sexual and athlete violence in college sports must change. *Forbes*. <https://www.forbes.com/sites/bdavid-ridpath/2016/09/15/the-attitude-toward-sexual-and-athlete-violence-in-college-sports-must-change/#4588933b5eaf>
- Rinehart SJ, Espelage DL, & Bub KL (2017). Longitudinal effects of gendered harassment perpetration and victimization on mental health outcomes in adolescence. *Journal of Interpersonal Violence*. Advance online publication. 10.1177/0886260517723746
- Rovio E, Eskola J, Kozub SA, Duda JL, & Lintunen T (2009). Can high group cohesion be harmful? A case study of a junior ice-hockey team. *Small Group Research*, 40(4), 421–435.
- Salazar LF, Swartout KM, Swahn MH, Bellis AL, Carney J, Vagi KJ, & Lokey C (2018). Precollege sexual violence perpetration and associated risk and protective factors among male college freshmen in Georgia. *Journal of Adolescent Health*, 62(3), S51–S57.
- Sanders-Phillips K (2009). Racial discrimination: A continuum of violence exposure for children of color. *Clinical Child and Family Psychology Review*, 12(2), 174–195. [PubMed: 19466544]
- Sidanius J, & Pratto F (2001). *Social dominance: An intergroup theory of social hierarchy and oppression*. Cambridge University Press.
- Smith SG, Zhang X, Basile KC, Merrick MT, Wang J, Kresnow M, & Chen J (2018). The National Intimate Partner and Sexual Violence Survey (NISVS): 2015 Data brief. National Center for Injury Prevention and Control, Centers for Disease Control and Prevention.
- Taliaferro LA, Rienzo BA, & Donovan KA (2010). Relationships between youth sport participation and selected health risk behaviors from 1999 to 2007. *Journal of School Health*, 80(8), 399–410.

- Tharp AT, DeGue S, Valle LA, Brookmeyer KA, Massetti GM, & Matjasko JL (2013). A systematic qualitative review of risk and protective factors for sexual violence perpetration. *Trauma Violence Abuse, 14*(2), 133–167. [PubMed: 23275472]
- West C (2014). Battered, black, and blue: An overview of violence in the lives of Black women. In West C (Ed.), *Violence in the lives of Black women: Battered, black, and blue* (pp. 13–52). Routledge.
- Williams DR, & Mohammed SA (2013). Racism and health I: Pathways and scientific evidence. *American Behavioral Scientist, 57*(8), 1152–1173.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 1.

Sample Characteristics (Demographic and Primary Study Variables) of Males and Females.

Variable	<i>M (SD) or n (%)</i>	Male	Female
Demographics and control variables			
Age	12.8 (1.08)	12.8 (1.08)	12.7 (1.09)
Female	770 (49.5%)	—	—
African American	734 (47.2%)	378 (48.1%)	356 (46.2%)
Non-Hispanic White	577 (37.1%)	289 (36.8%)	288 (37.4%)
Other	195 (12.5%)	96 (12.2%)	99 (12.9%)
Hispanic	50 (3.2%)	23 (2.9%)	27 (3.5%)
Mother's education HS or less ^a	866 (55.5%)	420 (53.4%)	446 (57.7%)
SV perpetration MS	517 (33.2%)	282 (35.9%)	235 (30.4%)
Alcohol/cigarette use in MS	570 (37.0%)	279 (36.0%)	291 (38.0%)
Alcohol use in HS ^b	178 (28.1%)	80 (26.6%)	98 (29.5%)
Drug use in MS	258 (16.8%)	127 (16.4%)	131 (17.1%)
Drug use in HS ^b	214 (33.7%)	108 (35.8%)	106 (31.8%)
Traditional masculinity in MS	1.92 (.46)	2.05 (.44)	1.80 (.44)
Primary study variables			
High school SV perpetration	205 (13.1%)	115 (14.6%)	90 (11.6%)
Sports involvement in MS ^c			
No sports involvement	735 (58.7%)	379 (58.6%)	356 (58.8%)
No contact sports	97 (7.7%)	56 (8.7%)	41 (6.8%)
Low contact sports	153 (12.2%)	20 (3.1%)	133 (22.0%)
High contact sports	267 (21.3%)	192 (29.7%)	75 (12.4%)

Note. MS = middle school (Waves 1–4); HS = high school (Waves 5–6); SV = sexual violence.

^aMother's education was coded as 1 = *high school or less* and 0 = *more than high school*.

^bMissingness was highest among high school alcohol and drug use variables.

^cSports involvement categories are mutually exclusive and determined based on the highest contact of sports involvement.

Table 2.

Logistic Regression Testing Associations Between Each Independent Variable and SV Perpetration in High School.

Variable	OR [95% CI]
Sex	
Male	1.00
Female	0.77 [0.57, 1.03]
Racial/ethnic group	
Non-Hispanic White	1.00
Racial/ethnic minority	2.39 [1.68, 3.39]
Mother's education ^a	
More than high school	1.00
High school or less	0.88 [0.79, 0.99]
SV perpetration MS	
No	1.00
Yes	1.48 [1.10, 2.00]
Alcohol/cigarette use MS	
No	1.00
Yes	1.27 [0.94, 1.71]
Alcohol use HS ^b	
No	1.00
Yes	1.39 [0.95, 2.03]
Drug use MS	
No	1.00
Yes	1.26 [0.87, 1.83]
Drug use HS ^b	
No	1.00
Yes	1.48 [1.03, 2.13]
Traditional masculinity MS	1.58 [1.07, 2.33]
Sports involvement MS	
No sports involvement	1.00
No/low contact sports	1.34 [0.89, 2.00]
High contact sports	1.78 [1.23, 2.60]

Note. All odds ratios for sports involvement are in reference to the "no sports involvement" group. Bold values = $p < .05$. SV = sexual violence; OR = crude odds ratio; CI = confidence interval; MS = middle school (Waves 1–4); HS = high school (Waves 5–6)

^aMother's education was coded as 1 = *high school or less* and 0 = *more than high school*.

^bMissingness was highest among high school alcohol and drug use variables.

Table 3. Main Effect Logistic Regression Model Testing Associations With SV Perpetration in High School, Overall Sample.

Variable	Perpetrated SV number (%)	Model 1 Demographic Predictors AOR [95% CI]	Model 2 Middle School Predictors AOR [95% CI]	Model 3 High School Predictors AOR [95% CI]	Model 4 Full Model AOR [95% CI]
Sex					
Male	115 (14.6%)	1.00	1.00	1.00	1.00
Female	90 (11.6%)	0.76 [0.57, 1.03]	0.85 [0.62, 1.17]	0.84 [0.61, 1.16]	0.79 [0.56, 1.11]
Racial/ethnic group					
Non-Hispanic White	44 (7.6%)	1.00	1.00	1.00	1.00
Racial/ethnic minority	161 (16.4%)	2.28 [1.59, 3.26]	2.21 [1.53, 3.19]	2.35 [1.61, 3.43]	2.35 [1.60, 3.48]
Mother's education ^a					
More than high school	84 (12.1%)	1.00	1.00	1.00	1.00
High school or less	121 (14.0%)	0.93 [0.83, 1.05]	0.94 [0.83, 1.05]	0.93 [0.83, 1.05]	0.93 [0.82, 1.05]
SV perpetration MS					
No	121 (11.6%)	1.00	1.00	1.00	1.00
Yes	84 (16.2%)	1.40 [1.02, 1.92]	1.40 [1.02, 1.92]	1.34 [0.97, 1.85]	1.25 [0.90, 1.73]
Alcohol/cig use MS					
No	118 (12.2%)	1.00	1.00	1.00	1.00
Yes	85 (14.9%)	1.02 [0.72, 1.45]	1.02 [0.72, 1.45]	0.96 [0.68, 1.38]	0.94 [0.65, 1.35]
Alcohol use HS ^b					
No	117 (25.7%)	1.00	1.00	1.00	1.00
Yes	58 (32.6%)	1.42 [0.91, 2.22]	1.42 [0.91, 2.22]	1.42 [0.87, 2.16]	1.37 [0.87, 2.16]
Drug use MS					
No	163 (12.7%)	1.00	1.00	1.00	1.00
Yes	40 (15.5%)	0.88 [0.57, 1.36]	0.88 [0.57, 1.36]	0.84 [0.54, 1.29]	0.85 [0.54, 1.31]
Drug use HS ^b					
No	105 (24.9%)	1.00	1.00	1.00	1.00
Yes	71 (33.2%)	1.26 [0.82, 1.92]	1.26 [0.82, 1.92]	1.26 [0.82, 1.92]	1.31 [0.85, 2.01]
Traditional masculinity MS					
Sports involve. MS		1.42 [0.92, 2.20]	1.42 [0.92, 2.20]	1.39 [0.90, 2.16]	1.45 [0.93, 2.25]

Variable	Perpetrated SV number (%)	Model 1 Demographic Predictors AOR [95% CI]	Model 2 Middle School Predictors AOR [95% CI]	Model 3 High School Predictors AOR [95% CI]	Model 4 Full Model AOR [95% CI]
No sports involve	67 (9.1%)				1.00
No/low contact	36 (14.4%)				2.08 [1.30, 3.33]
High contact	46 (17.2%)				1.55 [1.00, 2.38]

Note. All odds ratios for sports involvement are in reference to the “no sports involvement” group. The model has been adjusted for all variables shown. Bold values = $p < .05$. SV = sexual violence; AOR = adjusted odds ratio; CI = confidence interval. MS = middle school (Waves 1–4); HS = high school (Waves 5–6).

^aMother’s education was coded as 1 = high school or less and 0 = more than high school.

^bMissingness was highest among high school alcohol and drug use variables.

Table 4. Multigroup Logistic Regression Models Testing Associations With SV Perpetration in High School, by Sex of the Respondent.

Variable	Model 1 Demographic Predictors AOR [95% CI]	Model 2 Middle School Predictors AOR [95% CI]	Model 3 High School Predictors AOR [95% CI]	Model 4 Full Multigroup Model AOR [95% CI]
Males				
Racial/ethnic minority	2.14 [1.33, 3.45]	2.14 [1.32, 3.48]	2.33 [1.40, 3.86]	2.20 [1.30, 3.74]
Mother's education ^a	0.96 [0.82, 1.12]	0.95 [0.81, 1.11]	0.95 [0.81, 1.11]	0.94 [0.80, 1.11]
SV perpetration MS	1.62 [1.06, 2.48]	1.62 [1.06, 2.48]	1.56 [1.01, 2.41]	1.55 [1.00, 2.39]
Alcohol/cig use MS	1.26 [0.79, 2.02]	1.26 [0.79, 2.02]	1.20 [0.74, 1.93]	1.14 [0.70, 1.84]
Alcohol use HS			1.67 [0.90, 3.11]	1.67 [0.88, 3.17]
Drug use MS	0.82 [0.46, 1.46]	0.82 [0.46, 1.46]	0.76 [0.42, 1.38]	0.77 [0.42, 1.40]
Drug use HS			1.25 [0.70, 2.25]	1.26 [0.70, 2.29]
Trad. masc. MS	1.01 [0.55, 1.87]	1.01 [0.55, 1.87]	0.99 [0.54, 1.85]	1.05 [0.56, 1.97]
No/low contact				1.89 [0.87, 4.12]
High contact				1.89 [1.13, 3.15]
Females				
Racial/ethnic minority	2.47 [1.42, 4.27]	2.34 [1.33, 4.10]	2.42 [1.36, 4.30]	2.58 [1.44, 4.63]
Mother's education ^a	0.90 [0.75, 1.07]	0.90 [0.75, 1.08]	0.90 [0.75, 1.08]	0.90 [0.75, 1.07]
SV perpetration MS	1.17 [0.72, 1.91]	1.17 [0.72, 1.91]	1.12 [0.68, 1.84]	0.99 [0.59, 1.66]
Alcohol/cig use MS	0.78 [0.46, 1.34]	0.78 [0.46, 1.34]	0.75 [0.43, 1.29]	0.73 [0.42, 1.26]
Alcohol use HS ^b			1.19 [0.62, 2.29]	1.16 [0.60, 2.25]
Drug use MS	0.99 [0.52, 1.88]	0.99 [0.52, 1.88]	0.95 [0.50, 1.82]	0.98 [0.51, 1.89]
Drug use HS ^b			1.27 [0.68, 2.35]	1.35 [0.72, 2.54]
Trad. masc. MS	1.95 [1.05, 3.61]	1.92 [1.04, 3.57]	1.92 [1.04, 3.57]	2.00 [1.06, 3.76]
No/low contact				2.10 [1.15, 3.83]
High contact				0.90 [0.35, 2.33]

Note. All odds ratios for sports involvement are in reference to the "no sports involvement" group. Bold values = $p < .05$. SV = sexual violence; AOR = adjusted odds ratio. Each model adjusted for all variables shown. MS = middle school (Waves 1–4). HS = high school (Waves 5–6).

^aMother's education was coded as 1 = high school or less and 0 = more than high school.

^bMissingness was highest among high school alcohol and drug use variables.