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School Contextual Factors and Race Differences in Adolescent Sexual Behaviors

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Abstract

While there exist a voluminous number of studies examining predictors of adolescent sexual behavior, few studies have explored the role of the school social context in influencing teen sexual activity generally and specifically, the role that school contextual factors play in helping understand race differences in risky sexual behaviors. Using data from a nationally-representative school-based survey of American youth in grades 7–12, we find support for our core hypothesis that school contextual factors are associated with risky sexual behavior, number of sexual partners, and ever having sex, albeit in nuanced ways and that such factors cannot account for much of the race gap in adolescent sexual behavior. We interpret these findings to be more supportive of a social contagion model (versus a school climate model).

According to the Centers for Disease Control and Prevention (CDC), United States (US) high school students engage in a variety of sexually risky behaviors that put young people at a heightened risk for HIV infection, other sexually transmitted infections (STIs), and unintended pregnancies (CDC 2017). Indeed, a recent survey of US high school students found that of those surveyed, nearly a third reported having intercourse in the past 3 months and 43% did not use a condom the last time they had sex and 21% had drunk alcohol or used drugs during that sexual encounter (CDC 2017). Not surprisingly, half of the nearly 20 million new cases of STIs reported annually in the US involve young people, 15–24 years old (CDC 2015) and additional evidence suggests that globally, sixty percent of youth are presently infected with an STI (DaRos and Schmidt 2008). And teenage pregnancy in America is associated with a number of disadvantages for the mother, including a lower high school completion rate and lower wages (Hoffman 2008).

There exists considerable evidence of race differences in adolescent risky sexual behaviors in America, including age of initiation in sexual activity, having multiple sexual partners, and condom use (Rowe 2002; Lansford 2010; Holway, 2015). For example, African Americans adolescents have been found to be at a heightened risk for engaging in various sexual behaviors, including being currently sexually active and having multiple sexual

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partners, and initiating sex at an earlier age, although African Americans are more likely to use condoms (R-Almendarez and Wilson 2013; Eaton et al. 2012; Browning, Leventhal, and Brooks-Gunn 2005). Likewise, Hispanic adolescents' likelihood of engaging in sexual behaviors are often considered being "in-between" whites and African Americans (R-Almendarez and Wilson 2013). However, some evidence exists that suggests Latino immigrants in America are much less likely to engage in sex than other groups (Hussey, et al, 2007). Further, in addition to differences in sexual behavior, research suggests that African American and Hispanic adolescents are also more likely to report less knowledge about sexuality and lower sexual self-efficacy, which helps to partially account for their higher number of sexual partners by young adulthood relative to non-Hispanic whites (Thorsen, 2018).

Several studies have explored the predictors of sexual behavior generally, with increasing focus on adolescent risky sexual activity. While a comprehensive review of this literature is not warranted here, scholars have established a number of individual-level correlates of adolescent sexual behaviors, including economic disadvantage, family structure, and education, family attachment, and parental monitoring and supervision (Hogan, Sun, and Darroch 2000; Buhi and Goodson 2007). Despite the accumulation of knowledge regarding individual and family correlates of adolescent sexual behavior, our explorations into the role of school level contextual factors for understanding youth sexual behavior are relatively nascent, despite considerable support for the notion that the school is an essential context for understanding adolescent development and behavior (Upchurch et al. 2004). Of the studies that have explored the role of school contextual factors for adolescent sexual behaviors, most have found that some aspects of the school are associated with teen sexual behavior, including percent of student body having sex, school social environment, school satisfaction, connectedness, attendance, school poverty, and school disorder and vandalism (Coley et al. 2013; Takakura, Wake, and Kobayashi 2010; Resnick et al. 1997; Manlove 1998; Chandy et al. 1994). Given that racial and ethnic minority youth in America are more likely to attend schools that differ in resources and composition than white youth, an obvious question is whether racial/ethnic disparities in sexual behaviors can be (partly) explained by differences in school contexts.

While there exists a number of possible explanations for understanding how school contexts affect adolescent risky sexual behaviors, our study utilizes insights from two theories—social contagion theory and school climate theory. Social contagion models emphasize the role of peer modeling and the reinforcement of behaviors as attractive, normative activity, when engaged in by peers (Rodgers and Rowe 1993). Adolescent sexual behaviors are acquired by students through typical mechanisms of social learning, with the opportunity for interaction between sexually active students and non-active students as instrumental for determining the acquisition of such behavior (Rodgers and Rowe 1993). Consistent with social contagion theory, a student who attends a school where students are more likely to engage in risky sexual behaviors may be more apt to adopt the dominant group's behavior and engage in risky sexual behaviors, independent of their own social characteristics.

Consistent with the social contagion model is the notion of sexual networks (Morris et al. 2009). Such networks provide an alternative way of thinking about risk behaviors by moving

beyond just an individual's behavior and also considering his or her partner's behavior and his or her position in a sexual network (Morris et al. 2009; pg. 1029). The sexual network perspective can be used to link individual risk factors to risk factors in the student population overall.

School climate models emphasize "the ability of the social organization to maintain order and meet its goals; school effectiveness is the ability to exert effective social control" (Rountree and Clayton 1999: 501). School climate, originally conceptualized by Anderson (1982) as the personality of the school, involves the mechanisms by which schools can inhibit unwanted student behaviors, including risky adolescent sexual behavior, through effective social control that is both formal (such as the clarity of rules and enforcement practices) and informal (the degree of school attachment or bonding between students and the school) in nature. Schools promoting a sense of community among students, with a pro-academic ethos, clear rules and discipline practices for rule violations, and a sense among students that teachers and administrators care and like students will experience fewer unwanted student behaviors (Welsh et al. 2000; Henry and Slater 2007), including (presumably) risky sexual behaviors.

In addition to these two models, additional evidence suggests that other school contextual factors, including the school's financial resources and whether the school offers sex education or not are salient predictors of adolescent sexual activity. With regards to financial resources, some scholars have posited that there exist lowered opportunity costs associated with engaging in risky sexual behaviors because of the bleak prospects for legitimate employment, higher education, quality living arrangements and other opportunities of youth facing a dearth of economic resources (Billy, Brewster, and Grady 1994). And regarding sex education programs in the US, a meta-analysis of studies of the association between sex and HIV education programs and various outcomes suggests that such programs can be effective in delaying or decreasing sexual activity and in practicing safe sex (Kirby, Laris, and Rolleri 2007). However, a subsequent study found that not all sex education programs are equal—abstinence focused programs are much less successful in having positive effects on sexual behavior than more comprehensive sex and HIV education programs (Kirby 2008).

A focus on race differences in sexual behaviors is warranted given the heightened risk of contracting STIs and unplanned pregnancies for racial minorities. Evidence of these differences is striking: African Americans are disproportionately infected with STIs, including a gonorrhea rate that is 31 times greater and a Chlamydia rate that is six times greater than non-Hispanic whites (Centers for Disease Control and Prevention 2010; Morris et al. 2009). The number of cases and diagnoses rates among African Americans for HIV/AIDS is greater than all other race/ethnic groups combined (Morris et al., 2009). Likewise, Hispanics comprise 17% of the US population but 23% of diagnoses of HIV infection. Their rate of gonorrhea is 1.9 times that of whites, their chlamydia rate is 2.1 times greater, and their syphilis rate is 2.2 times (CDC 2017). Given that the risk of unplanned pregnancies and STIs, including HIV/AIDs, is greatest among adolescents, understanding and reducing such race disparities should be a public health priority (Bearinger et al. 2007; Santelli et al. 1999; Satterwhite et al. 2013)).

Research on the mechanisms of these STI disparities, however, suggest that racial differences in sexual behavior do not entirely explain differential rates of STI infection (Eitle, Greene, and Eitle 2015; Ellen et al. 1998; Hallfors et al. 2007). Rather, some research suggests that larger contextual factors, such as the socioeconomic environment and patterns of racial segregation, impact the ecological context in which people live and the nature of their sexual networks (Adimora and Schoenbach 2005; Hogben and Leichter 2008). This body of research points to the importance of considering the contextual environment and its influence on the epidemiological context and sexual networks to help understand STI disparities. These findings also highlight the usefulness of considering school context (which involves the network of students at the school) to understand racial differences in sexual behavior.

While our primary focus is on the association between school level factors and adolescent sexual behaviors, we examine these associations while simultaneously considering more proximal influences, including stress exposure, coping resources, and parental characteristics. Adolescence is marked by significant developmental changes and exposure to myriad interpersonal stressors. Exposure to social stressors, in conjunction with coping resources that adolescents possess to manage such stress, have been implicated in predicting a number of sexual risk behaviors (Donenberg & Pao, 2005; Teva, Bermudez, and Buella-Casal, 2010; Hall, Moreau, Trussell, & Barber, 2013; Mazzaferro et al., 2006; Hulland et al., 2015). However, a positive, social support network of parents, family, and friends can serve to deter sexual activity among adolescents (Parkes et al., 2011; Price & Hyde, 2009; Zimmer-Gembeck & Helfand, 2008). Likewise, risky sexual behavior has been found to be negatively associated with self-esteem (Kerpelman et al., 2016). Both self-esteem and high academic achievement are expected to reduce the likelihood of adolescent risky sexual behaviors; youth who perform well in school have a positive futuristic outlook and are expected to have a greater understanding of the risk involved in adolescent risky sexual behaviors (Wheeler, 2010: 583). Finally, parents can exert a protective role on adolescent sexual risky behaviors in a number of ways beyond providing positive social support. For example, living with two parents has been found to be protective (teens living in a divorced or single-parent family are more likely to be involved in risky sexual behaviors [Jeynes, 2001; Miller, 2002; Lohman and Billings, 2007]). Additionally, family SES has also been found to be a protective factor against youth risky sexual behavior (Lynch, 2001).

A focus on the predictors of adolescent risky sexual behavior is warranted, given that patterns of sexual behavior initiated during adolescence have been found to have long-term consequences for later sexual behavior and health (Fergus, Zimmerman, and Caldwell, 2007). Several components of adolescent sexual behavior have been linked with STI risk in young adulthood, including early age at first intercourse, inconsistent contraceptive use, alcohol and substance use at intercourse, and multiple partnerships (Halpern-Felsher, Millstein, and Ellen, 1996; Kaestle, Halpern, Miller, and Ford, 2005; Shafii, Stovel, and Holmes, 2007; Thorsen, 2018; Vasilenko, Kugler, Butera, and Lanza, 2015). Further, a number of studies using the current dataset, the National Longitudinal Study of Adolescent to Adult Health, have found long term associations between our adolescent sexual behavior outcomes and later sexual health in adulthood (e.g. Kaestle, Halpern, Miller, and Ford, 2005; Shafii, Stovel, and Holmes, 2007; Thorsen, 2018; Vasilenko, Kugler, Butera, and

Lanza, 2015). Therefore, by examining the larger contextual mechanisms underlying adolescent sexual behavior, we gain insight into the source of variation in sexual health later in adulthood.

This article examines whether a number of school contextual factors serves to help explain racial/ethnic disparities in student sexual behaviors among a representative sample of US adolescents during middle and high school. Specifically, we explore whether the differences in sexual behaviors, including number of sexual partners, risky sexual behaviors, and ever had sex are partially explained by differences in school socioeconomic, structural, and compositional factors. We explore these associations while simultaneously examining the role of established individual correlates of adolescent sexual behavior.

METHODS

Data for the current study come from Wave I of the National Longitudinal Study of Adolescent to Adult Health (Add Health), a nationally-representative (US) school-based survey of youth in grades 7–12 on their health and social behavior (Harris et al., 2009). The first wave of data collection took place during the 1994–1995 school year and included an in-school questionnaire of students ($n=90,118$) and school administrators ($n = 144$) as well as an at-home questionnaire for a subset of students ($n = 20,745$). Information for the current study about the school context was drawn from both the in-school and administrator questionnaires and includes 121 schools who were not missing on school-level data. Individual level data on students' health and social behavior was drawn from the Wave I at-home questionnaire. The analytic samples include non-Hispanic white, black, and Hispanic students with a valid sample weight who were not missing on school-level information ($n = 10,527$). All analyses were conducted using HLM 7.

Dependent Variables

Three aspects of adolescent sexual behavior were considered in the current study. Whether the respondent *ever had sex* was based on a question asking respondents whether they had ever had penile-vaginal intercourse. *Number of sexual partners* was a continuous measure capped at 20 partners, the 99th percentile, to adjust for the extreme values of outliers. *Risky sexual behaviors* was a count index that captured adolescents' engagement in five behaviors that have been identified as risky for sexual health in the literature (range 0 – 5): exchanging sex for drugs or money, reporting never using a condom during sexual intercourse, reporting an early age at first sexual initiation (before the age of 15), reporting that they were drunk at the time of their first or most recent sexual intercourse, and reporting they were on drugs at their first or most recent sexual intercourse.

Explanatory variables

Measures of the school context were created by aggregating information from the in-school questionnaire of students as well as using school-specific information from the administrator's questionnaire. These school-level measures include racial composition and environment. Two measures of racial composition were included in the current study: *percent Hispanic* (range 0 – 0.89) and *percent Black* (range 0 – 0.94). Composition

differences may be associated with differences in exposure to sexual norms and practices; some norms may support greater sexual risk taking among adolescents (Cubbin et al. 2005; Warner et al. 2011). A binary indicator of school type, whether the school was a *junior high school* rather than a high school, was also included.

Principal component analysis was used to create measures of the school environment using seven indicators of the school setting: average student grade-point average (GPA), average level of student attachment to the schoolⁱ, percentage of families that participated in a parent-teacher association (PTA), percentage of seniors in college-preparatory classes, size of the school, average class size, and whether the school was private.

After running a principal component analysis (PCA) of these seven factors with a varimax rotation, two components were retained. These two factors represent the *positive school climate* and *school resources*. The *positive school climate component* captures dimensions of support in the school environment including: higher average student GPA, greater average attachment to the school, smaller school and class size, and a higher likelihood of being a private school.

The *school resources* component captures aspects of the school environment associated with greater financial resources for students, including more students enrolled in college preparatory courses and a higher likelihood that the school is private. School *sex education program* was measured by a single item that was asked of school administrators: “Does your school offer sex education, or family life education, or education about human sexuality and/or AIDS or other sexually transmitted diseases?” And finally, we include a measure of the *number of reported pregnancies* (natural log) at a given school as an indirect measure of school level sexual activity.

Individual variables

Several sociodemographic characteristics of adolescents have been found to be predictive of sexual behavior and therefore are included as individual-level predictors: gender, age, race, parental education, family structure, GPA, self-esteem, social support, and recent life events. *Race* was measured by self-nomination of students for any of the three following categories: “Non-Hispanic White”, “Non-Hispanic Black”, and “Hispanic.” *Family structure* was comprised of four dummy variables: biological married parents (the referent category), married stepfamily, single parent family, and other family form. A measure of the highest level of *parental education* among available parents included dummy variables capturing three categories: 1 “no parent graduated from high school”, 2 “at least one parent graduated from high school”, 3 “at least one parent graduated from college”. Information on the students’ grades in their English, history, math, and science classes (1 “D or lower” to 4 “A”) were used to calculate their *grade point average* (*GPA*; range 1 – 4). A mean scale of the youth’s sense of *self-esteem* was calculated from seven items which asked respondents how much they agreed or disagreed (1 “strongly disagree” to 5 “strongly agree”) with

ⁱSchool attachment was created from a series of questions asking students how much they agree or disagree with the following statements (1 “strong disagreement” to 5 “strong agreement”): they feel close to people, safe, a part of, and happy at school, and the teachers at their school treat students fairly. Responses were aggregated to the school level.

statements such as: you have a lot of good qualities, you like yourself the way you are, and you feel socially accepted ($\alpha = 0.85$). *Social support* was calculated from six items asking how much they feel adults care about them, teachers care about them, parents care about them, their family understands them, their family has fun together, and their family pays attention to them (0 “not at all” to 4 “very much”; $\alpha = 0.79$). Finally, *recent life events* is a count index of respondents’ experience in the past year of eighteen stressful life events: school suspension, school expulsion, moving residence, mother died, father died, female respondent reported becoming pregnant in the past year, female respondent reported being raped in the past year, serious injury, respondent attempted suicide, friend attempted suicide, family member attempted suicide, needed medical attention but didn’t receive it, tested or treated for an STI in the past year, saw someone shoot or stab someone else, had someone pull a knife on them, had someone shoot them, had someone cut or stab them, were jumped. In multi-level analyses, continuous individual level variables were standardized to have a mean of zero and a standard deviation of one.

Analytic Strategy

Multilevel negative binomial regression models are used to predict the two count measures (risky sexual behaviors and number of sexual partners) while multilevel logistic regression modeling is employed for the dichotomous dependent variable (ever had sex). Model 1 of the regression analyses included only the gender, age, race, and school type variables. Our interest is in the estimated coefficients for black and Hispanic adolescents, relative to their white counterparts. We next consider the role of the aforementioned individual level correlates by adding these variables to each model, in order to evaluate whether such measures attenuate the strength of the race/ethnicity coefficients (Model 2). Finally, we consider the role of school-level factors. We repeat this strategy for each of the dependent variables. Table 1 provides the descriptive statistics for the variables considered in the analyses.

Results

Table 2 provides the results of models predicting number of sexual partners (Models 1–3) and risky sexual behaviors (Models 4–6). The baseline models (1 and 4) predicting the count of number of sexual partners and risky sexual behaviors include only gender, age, race, and school type. Models 2 and 5 include other individual level factors that may be associated with the dependent variable, including personal and social resources and exposure to stressful events (i.e., recent life events). Finally, models 3 and 6 include the school level predictors that allow us to examine the role of contextual factors in shaping individual sexual activity.

For ease in interpretation, we report incident rate ratios (IRRs) for the models in Table 2. The incident rate ratio is the incidence rate of an event, disease, or behavior occurring by exposure to some factor, divided by the incidence rate for those without exposure to some factor. For example, an IRR of 1.05 means that those exposed to some factor have an incidence rate that is 5% higher than those who have not been exposed to that factor.

In the baseline model predicting number of sexual partners (Model 1), we found, as expected, that race and gender were significant predictors of the dependent variable. For example, being a female decreased the expected number of sexual partners by 44%, while being black was associated with an increase in the expected number of sexual partners by 101% (compared to white, non-Hispanic students). There was no discernible difference between non-Hispanic white and Hispanic students in the expected number of sexual partners. Including the additional individual level variables led to a very modest attenuation in the black coefficient, with the adjusted incident rate ratio (IRR) being reduced from 2.01 to 1.91. However, a number of additional individual level variables were found to be statistically significant predictors of the number of sexual partners, including parental education, family structure, grade point average, and social support. For example, a one-unit increase in grade point average was associated with a decrease in the expected number of sexual partners by 9%, while a one-unit increase in recent life events was associated with an increase in the expected number of sexual partners by 25 percent, holding all other variables constant.

When we considered the model with the school contextual factors included (Model 3), we found that none of the measures were found to be statistically significant predictors of the dependent variable, although the inclusion of these measures does (again) lead to a modest reduction in the black coefficient. However, race (in this case, being black) is still a statistically significant predictor of number of sexual partners, even after controlling for both individual and school characteristics.

A similar pattern of predictors is revealed when one examines the baseline model predicting the risky behaviors (Model 4). Gender, age, and race are significant predictors of the number of risky behaviors, with females, younger students and non-Hispanic whites (relative to Blacks and Hispanic students) engaging in fewer risky sexual behaviors than their counterparts. The model that included additional individual level variables (Model 5) found that several factors including family structure, social support, grade point average and exposure to recent life events were statistically significant predictors of the dependent variable. Alternative family structures (relative to 2 parent family structure), and exposure to recent life events were associated with engaging in a greater number of risky sexual behaviors, while grade point average and social support served as protective factors, reducing the number of risky sexual behaviors reported (holding all other variables constant). Furthermore, the inclusion of these variables was found to attenuate both of the race coefficients, with a sixteen percent reduction in the IRR for Blacks and a similar reduction in the IRR for Hispanics.

When examining the model with the school contextual factors included (Model 6), three measures were found to be significant predictors of risky behaviors—percent Black, percent Hispanic, and whether the school has a sex education program or not. Both the relative size of the Black and Hispanic student population predicted involvement in risky sexual behaviors, albeit in different directions. For instance, a one-percent increase in percent Black students at a school increased the expected number of risky sexual behaviors reported by a student by 54%, holding all other variables constant. However, the relative size of the Hispanic student population serves as a protective factor, with increases in percent Hispanic

associated with a decrease in the expected number of risky sexual behaviors. Specifically, a one-percent increase in percent Hispanic decreased the expected number of risky sexual behaviors reported by a student by 58%, holding all other variables constant. Having a sex education program is marginally associated with an increase in the average number of risky sexual behaviors engaged in by students, a finding that is contrary to expectations. The measure of pregnancies reported in the school was not found to be a statistically significant predictor of the dependent variable, however.

Table 3 reports the results of logistic regression models predicting whether a student had ever had sex. Model 1 reported the results of the analysis examining only the baseline variables, Model 2 included additional individual level predictors, and Model 3 included the school contextual level predictors. A quick perusal of Model 1 reveals that gender, age, and race are statistically significant predictors of ever having sex, with females, younger students and non-Hispanic whites being less likely to have had sex than their counterparts. In model 2, we find that a number of variables were statistically significant predictors of whether an adolescent had ever had sex: gender, age, family structure, grade point average, recent life events exposure, and social support. Each of these variables were found to be associated in the same direction as expected (and as found in the results reported in Table 2)—males, older students, lower parental education, non-two parent family forms (except for single-parent families), lower grade point average, greater exposure to recent life events, and less social support were all significantly associated with higher odds of ever having sex. Self-esteem was also predictive of ever having sex, with those reporting having higher self-esteem being associated with increased odds of ever having sex (holding all other variables constant). Finally, race was a significant predictor of the odds of ever having sex, but the inclusion of these other predictors again attenuated the associations, and actually reduced the strength of the Hispanic coefficient to the point that it was no longer statistically significant. For Black students (relative to whites) the odds of ever having sex were 135 percent greater, holding all other variables constant.

The inclusion of the school contextual variables demonstrate that a number of school measures were predictive of the odds of a student ever having sex (Model 3). Again, percent Black and percent Hispanic work in opposite directions—percent Black served to increase the odds of a student ever having sex, while percent Hispanic decreased those odds. And of the two measures of school characteristics, resource advantaged was found to be a significant predictor of a student ever having sex, serving as a protective factor, with increased resources associated with lowered expected odds of ever having sex. Both having a sex education program and the number of reported pregnancies were associated with greater expected odds of ever having sex.

Discussion

The purpose of this study was to evaluate the role that school-level contextual factors played in predicting US student-level involvement in risky sexual behaviors generally and whether such factors served to explain race differences in involvement in such behaviors specifically. We found modest support for both hypotheses—while a few of the factors examined were predictive of student-level involvement in risky sexual behaviors and the decision to have

sex, the ‘race gap’ between non-Hispanic whites and blacks in particular still remained substantial. Nonetheless, our findings do suggest that school contexts matter in understanding student-level sexual behavior. Perhaps the most compelling finding was that school racial composition was associated with adolescent sexual behaviors in a nuanced way—percent Black was associated with an increased risk of student level involvement in risky sexual behaviors, while percent Hispanic was associated with a decreased risk of student level involvement in such behaviors. While a couple of studies have considered the role of racial composition as a contextual factor in understanding student sexual activity (e.g., Furstenberg et al. 1987; Teitler and Weiss 2000), our study represents the most comprehensive look at the role of US school racial composition in understanding student level risky sexual behavior to date, with multiple measures of racial composition considered. Furthermore, by also controlling for measures of school culture/resources, we began to differentiate between competing explanations for how racial composition may influence student level sexual behavior. Of the two explanations (social contagion and school climate) proffered, the evidence more strongly supports a social contagion model of risky sexual behavior. Across the three dependent variables examined, only our measure of school resources was found to predict one dependent variable—ever had sex—our measure of school climate was not found to be a significant predictor of any of the three dependent variables. Social contagion models, which focus on learning norms and behaviors from others, suggest that exposure to dominant groups will lead to individuals taking on the norms and behaviors of such groups. In our analyses, students in schools that are relatively high percent Black would be more apt to engage in risky sexual behaviors, whereas students attending schools that are relatively high percent Hispanic would be less apt to engage in risky sexual behaviors. In short, individual students, regardless of race, are apt to take on the sexual norms and behaviors of their fellow students. And although modest, additional support for a social contagion explanation was found in the model predicting ever had sex—our measure of the number of reported pregnancies was positively associated with this dependent variable. Indeed, additional analyses (not reported; available upon request) revealed that when reported pregnancies is the only school level factor considered in the model, it is a statistically significant predictor of the number of sex partners reported (O.R. –1.17) and risky sexual behaviors (O.R. –1.12), suggesting that there is overlap between this measure of risky sexual activity and the racial composition measures.

Although the aforementioned evidence of the relationship between race/ethnicity and risky sexual behavior is mixed regarding Hispanics/Latinos (Ku et al. 1993; R-Almendarez and Wilson 2013), the finding that higher percentage of Hispanic students at a school was associated with reduced odds of students being involved in risky sexual behavior is consistent with another study that examined neighborhood factors and adolescent sexual behavior in America. Cubbin (2005) found that a neighborhood’s racial composition was predictive of whether adolescents ever had sex, with percent Black serving to increase the odds and percent Hispanic serving to decrease the odds. Although both our study and Cubbin’s found that percent Hispanic served as a protective factor in the neighborhood and school alike, neither study could definitely explain why the relative size of the Hispanic population serves to reduce adolescent sexual behavior. Although speculative, we agree with Denner and colleagues (2001) that the key may be the sharing of cultural norms from the

‘home country’ (commitment to family, intergenerational families, religious values, respect for adults, close monitoring and supervision of girls).

Contrary to expectations, we found that having a sex education program at a school was associated with *increased* involvement in sexual activity among students. However, this may be due to the cross-sectional nature of the data, given that higher risk schools are more likely to employ such programs (Kirby, 2002).

Finally, our results also demonstrate support that a number of individual and family protective factors serve to reduce the risk of involvement in risky sexual activities, including academic performance (grade point average), social support, and family structure, consistent with prior research (e.g., Mazzaferro et al. 2006; Hogan, Sun, and Darroch 2000). Likewise, we found that exposure to stressors (measured as recent life events) was a risk factor associated with an increased involvement in risky sexual behaviors, consistent with prior research (Mazzaferro et al. 2006; Harvey and Springer 1995; Hulland et al., 2015). Our findings support the notion that either stressed youth may turn to sexual behavior as a coping mechanism (i.e., a way to deal with stress) or alternatively, stressed youth may be more vulnerable to being persuaded into engaging in risky sexual behaviors by others. Additional research exploring why stress exposure is associated with adolescent risky sexual behavior is warranted.

Strengths and limitations

Like all studies, the reader should consider the following limitations when assessing the merits of our study. First, because our data were cross-sectional, the reader should not conclude causality from any of the highlighted associations. Additionally, our measures of school climate and especially, school resource advantage may be inadequate proxies to fully capture the complexities of how a school’s culture, structure, and organization may influence behavior. Also, our study only pertains to students—these findings would not generalize to adolescents who have dropped out of school. Finally, we should also take note of the dated nature of our data. While we recognize that data collected two decades ago is an obvious limitation, the comprehensive nature of the Add-Health data and its representativeness of American schools and students provided unparalleled data to address our research question. Additionally, as mentioned earlier, adolescent experiences have dramatic and important implications for sexual behaviors and health years later (Kaestle, Halpern, Miller, and Ford, 2005; Shafii, Stovel, and Holmes, 2007; Thorsen, 2018; Vasilenko, Kugler, Butera, and Lanza, 2015). Hence, examining these associations are essential for improving our understanding of contemporary sexual health among adults. Nonetheless, we are hopeful that our research inspires additional future work examining the nexus between school factors and adolescent sexual behavior.

Conclusion

Schools have employed a number of policies and programs aimed at reducing risky sexual behaviors among students. These programs include abstinence-only programs, abstinence-plus (including contraceptive knowledge) programs, and HIV education programs. Evaluations of the effectiveness of these programs suggest that abstinence only programs are

ineffective but other programs can be effective (Santelli et al. 1999; Kirby 2008). Intervention and prevention efforts should also consider the role of sexual networks and larger contextual factors in contributing to the spread of risky sexual behaviors among vulnerable adolescent populations.

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Table 1.

Descriptive Statistics.

	Mean	Standard Deviation	Minimum	Maximum
Dependent Variables				
Risky sexual behaviors	0.26	0.56	0	5
Number of sexual partners	1.60	5.47	0	189
Ever had sex (1=yes)	0.35	0.48	0	1
Individual Level Characteristics				
Gender (Female=1)	0.52	0.50	0	1
Age	15.28	1.57	11	21
Race				
Non-Hispanic white	0.60	0.49	0	1
Black	0.24	0.43	0	1
Hispanic	0.16	0.37	0	1
Parental Education				
No high school (neither parent graduated high school)	0.13	0.37	0	1
High School Graduate (at least one parent graduated high school)	0.50	0.50	0	1
College Grad (at least one parent is a college grad)	0.37	0.48	0	1
Family Structure				
Two parent family	0.54	0.50	0	1
Single parent	0.25	0.43	0	1
Step parent	0.17	0.38	0	1
Other family form	0.04	0.21	0	1
Self-esteem	4.07	0.60	1	5
Grade point average	2.77	0.79	1	4
Recent Life Events	1.52	1.64	0	12
Social Support	3.01	0.62	0	4
School Level Characteristics				
Percent Black	0.15	0.22	0	.94
Percent Hispanic	0.11	0.15	0	.89
Positive School Climate	.01	1.47	-2.93	3.81
Resource Advantaged	-0.07	1.33	-2.90	4.11
School Sex Education Program (1=yes)	0.93	0.25	0	1
Number of reported pregnancies on campus (natural log)	1.61	1.21	0	5.02

Note: Individual level characteristics take into account weights and clustering; school level characteristics are weighted with the school weight.

Table 2.

Multilevel Negative Binomial Regression Results Predicting the Number of Risky Sexual Behaviors and Number of Sexual Partners among Students (confidence intervals in parentheses).

	Number of sexual partners (Level 1 n=10,527; Level 2 n=121)			Risky sexual behaviors (Level 1 n=10,527; Level 2 n=121)		
	1	2	3	4	5	6
	<i>IRR</i>	<i>IRR</i>	<i>IRR</i>	<i>IRR</i>	<i>IRR</i>	<i>IRR</i>
Gender	.56*** (.46,.69)	.62*** (.50, .76)	.61*** (.51,.75)	.80*** (.71, .90)	.89 (.78, 1.01)	.89 (.79, 1.00)
Age	1.71*** (1.49,1.96)	1.55*** (1.36, 1.77)	1.54*** (1.36, 1.74)	1.29*** (1.15, 1.45)	1.12 (1.00, 1.25)	1.11* (1.00, 1.24)
Race (white)						
Black	2.01*** (1.47, 2.75)	1.91*** (1.43, 2.57)	1.79*** (1.37, 2.34)	1.85*** (1.51, 2.28)	1.55*** (1.32, 1.83)	1.43*** (1.19, 1.72)
Hispanic	1.06 (.58, 1.94)	1.04 (.69, 1.55)	1.08 (.98, 1.18)	1.76*** (1.31, 2.37)	1.47** (1.15, 1.89)	1.54** (1.16, 2.05)
School level						
Junior High School	.80 (.50, 1.26)	.74 (.51, 1.08)	.81 (.57, 1.17)	.82 (.57, 1.18)	.76 (.55, 1.04)	.82 (.61, 1.10)
Parental Education (no high school)						
High school		1.38* (1.10, 1.74)	1.40** (1.14, 1.73)		1.07 (.88, 1.31)	1.09 (.91, 1.31)
College		1.29* (1.03, 1.62)	1.34** (1.08, 1.65)		.98 (.78, 1.23)	1.02 (.83, 1.25)
Family Structure (2 parent)						
Single parent		1.23* (1.02, 1.48)	1.22* (1.03, 1.46)		1.26* (1.05, 1.51)	1.25* (1.05, 1.49)
Step parent		1.42* (1.08, 1.86)	1.42** (1.10, 1.82)		1.33** (1.10, 1.61)	1.33** (1.10, 1.60)
Other parent		1.32* (1.04, 1.67)	1.30* (1.05, 1.62)		1.51*** (1.21, 1.90)	1.48*** (1.20, 1.83)
Self esteem		1.08 (.98, 1.19)	1.07 (.98, 1.18)		1.06 (.99, 1.14)	1.05 (.99, 1.13)
Grade Point Average		.91* (.84, .98)	.91* (.85, .98)		.85*** (.80, .90)	.85*** (.81, .91)
Recent Life Events		1.25*** (1.21, 1.30)	1.25*** (1.21, 1.29)		1.27*** (1.22, 1.32)	1.27 (1.22, 1.32)
Social Support		.75** (.62, .90)	.75*** (.63, .89)		.80*** (.73, .90)	.80*** (.73, .88)
School Characteristics						
% Black			1.54 (.85, 2.80)			1.69* (1.05, 2.74)
% Hispanic			.42 (.08, 2.34)			.43** (.25, .73)

	Number of sexual partners (Level 1 n=10,527; Level 2 n=121)			Risky sexual behaviors (Level 1 n=10,527; Level 2 n=121)		
Positive School Climate			1.00 (.87, 1.15)			1.03 (.93, 1.15)
Resource Advantaged			.96 (.85, 1.10)			.94 (.88, 1.02)
School Sex Education Program			1.65 (.88, 3.09)			1.75 ⁺ (.93, 3.32)
Number of reported pregnancies			1.17 (.94, 1.32)			1.08 (.94, 1.25)
Intercept	1.56 [*] (1.03, 2.36)	.98 (.71, 1.36)	.50 (.21, 1.22)	.25 ^{***} (.20, .32)	.19 ^{***} (.14, .25)	.09 ^{***} (.04, .21)

Note: Referents are in parentheses.

⁺
 $p < .10$

^{*}
 $p < .05$

^{**}
 $p < .01$

^{***}
 $p < .001$ (two-tailed tests).

Table 3.

Multilevel Logistic Regression Results Predicting ever had sex among Students (confidence intervals in parentheses).

	Ever had Sex (Level 1 n=10,527; Level 2 n=121)		
	1	2	3
	<i>Odds Ratio</i>	<i>Odds Ratio</i>	<i>Odds Ratio</i>
Gender	.87* (.77, .99)	1.03 (.50, .76)	1.02 (.88, 1.18)
Age	2.44*** (2.13, 2.79)	2.35*** (2.06, 2.68)	2.38*** (2.08, 2.73)
Race (white)			
Black	2.69*** (2.10, 3.44)	2.35*** (1.87, 2.96)	2.14*** (1.64, 2.80)
Hispanic	1.62** (1.16, 2.27)	1.30 (.95, 1.78)	1.39 (.96, 2.00)
School level			
Junior High School	.79 (.56, 1.12)	.69 (.49, .97)	.79 (.58, 1.08)
Parental Education (no high school)			
High school		1.02 (.80, 1.31)	1.05 (.82, 1.33)
College		.83 (.63, 1.10)	.85 (.64, 1.13)
Family Structure (2 parent)			
Single parent		1.22 (.99, 1.49)	1.05 (.82, 1.33)
Step parent		1.43*** (1.16, 1.76)	1.45*** (1.16, 1.81)
Other parent		1.85*** (1.39, 2.48)	1.81*** (1.33, 2.47)
Self esteem		1.14** (1.05, 1.25)	1.14** (1.04, 1.25)
Grade Point Average		.77*** (.71, .83)	.78*** (.58, 1.08)
Recent Life Events		1.51*** (1.41, 1.62)	1.52*** (1.41, 1.64)
Social Support		.67*** (.59, .76)	.67*** (.59, .76)
School Characteristics			
% Black			2.03* (1.06, 3.92)
% Hispanic			.24*** (.11, .52)
Positive School Climate			1.01 (.90, 1.13)

	Ever had Sex (Level 1 n=10,527; Level 2 n=121)		
	1	2	3
	<i>Odds Ratio</i>	<i>Odds Ratio</i>	<i>Odds Ratio</i>
Resource Advantaged			.91 ⁺ (.82, 1.01)
School Sex Education Program			2.21 [*] (1.05, 4.65)
Number of reported pregnancies			1.16 ⁺ (.98, 1.37)
Intercept	.48 ^{***} (.36, .66)	.43 ^{***} (.30, .62)	.16 ^{***} (.06, .42)

Note: Referents are in parentheses.

⁺
 $p < .10$

^{*}
 $p < .05$

^{**}
 $p < .01$

^{***}
 $p < .001$ (two-tailed tests).