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Adolescent Same-Sex Attraction and Academic Outcomes: The Role of School Attachment and Engagement

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Abstract

Schools create environments in which some sexual feelings, behaviors, and relationships are stigmatized, and this may have negative consequences for adolescents with nonheterosexual romantic attractions. This stigma can lead them to withdraw and disengage from school at a critical time of preparation for adulthood, which can compromise opportunities for future success. Previous research has demonstrated that sexual minority youth report greater levels of school-related problems, including a weaker sense of attachment to school and more trouble with teachers and peers. This lack of social integration is likely to affect their educational success. Data from the National Longitudinal Study of Adolescent Health and the newly collected Adolescent Health and Academic Achievement study provide the first opportunity to fully explore whether and to what extent same-sex attracted youth enter adulthood with an educational disadvantage. In this study, we examine (1) whether same-sex attracted adolescents have lower levels of academic success, (2) if their lower academic success is explained by a lack of social integration at school, and (3) whether these relationships differ for boys and girls. Results suggest that same-sex attracted students, particularly boys, do suffer academically, and that this is in part a result of school-related problems and risk factors such as emotional distress and substance use; however, a great deal of the disadvantage fails to be explained by these factors. Additionally, while same-sex attracted boys show poorer academic performance, same-sex attracted girls do not, suggesting that gender may shape how sexual minority youth experience and respond to marginalizing school environments

Keywords

adolescence; sexual minority youth; same-sex attraction; academic achievement; school attachment

Adolescence is a time of emerging sexuality as well as a period of preparation for the transition to adulthood. A great deal of this developmental work takes place within schools, important socializing institutions that prepare adolescents for adult roles and postsecondary education. As a proximate site of a broader normative culture that legitimizes some sexualities and deems others deviant, schools can create an unwelcoming environment for students with nonheterosexual feelings, identities, or behaviors. Adolescents who experience same-sex

romantic attractions may have a difficult time during this period as they weigh their feelings against a system of social norms that silences them and labels them as different.

The stigmatization faced by these students can lead to social withdrawal and isolation. Indeed, adolescents with same-sex attraction report poorer attitudes toward school and more trouble with teachers and peers (Rostosky et al. 2003; Russell, Seif, and Truong 2001). These problems emerge at a critical time of increased stratification, as students prepare for postsecondary education and career paths. Academic success and the ability to meet requirements for postsecondary education require successful interface between the adolescent and the institution, but students who are alienated from their school due to marginalizing social norms and hostile surroundings may be unable to negotiate this successfully. Accordingly, the difficulties faced during adolescence may have lasting consequences that extend into adulthood.

Existing data have not allowed researchers to systematically examine how sexual minority youth fare in school until now. Data collected by the Adolescent Health and Academic Achievement (AHAA) study (Muller et al. 2007) provide the first opportunity to explore whether and to what extent youth with same-sex attractions enter adulthood with an educational disadvantage compared to their other-sex attracted peers. By linking high school transcripts with the National Longitudinal Study of Adolescent Health (Add Health) survey (Udry 2003), we can compare sexual minority youths' success on a broad range of academic measures, from getting through high school to preparing for college education, to that of their other-sex attracted peers, and we can examine possible explanations for any differences found.

Previous Research

Schools as a Normative Context

Schools have a dual role in preparing adolescents for the transition to adulthood: they not only impart skills and knowledge but are important socializing institutions that convey social norms and values. In schools, as in the broader culture, heterosexuality is both assumed and enforced. This occurs both through school rituals (e.g., prom) as well as through daily interactions between students, teachers, and administrators (Akerlof and Kranton 2002; Eder, Evans, and Parker 1995; Flowers and Buston 2001; Reed 1994; Snyder and Broadway 2004). These processes create a heterosexist environment in which nonheterosexual behaviors or relationships are denied and denigrated (American Association of University Women 2001; Plummer 2001; Smith and Smith 1998; Telljohann and Price 1993; Thurlow 2001). Romantic feelings toward others of the same sex become a stigma, an attribute that merits shame and discrimination (Goffman 1963; Herek 2004). Students with actual or perceived same-sex attractions may be verbally and physically harassed (D'Augelli, Pilkington, and Hershberger 2002; Pilkington and D'Augelli 1995), and teachers often do not intervene (Human Rights Watch 2001).

During adolescence, sexuality becomes increasingly central to boys' and girls' lives as they experience changes associated with puberty and initiate romantic and sexual relationships. Though all adolescents can have a difficult time adjusting to these changes, students with same-sex attractions face the additional challenge of developing a positive identity within normative contexts that define these attractions as deviant (Flowers and Buston 2001). Erving Goffman (1963) argues that stigmatized individuals have internalized the same norms and values as those without the stigma and thus may concede that they fall short and respond with feelings of inferiority and shame. Even when individuals with a stigma do not perceive themselves as inferior, they may assume that others will not accept them and may isolate themselves to avoid rejection. Such consequences do not require a stigma to be known to others: same-sex attracted adolescents may feel the weight of sexual stigma regardless of whether their peers and teachers

are aware of these nonnormative attractions. Accordingly, adolescents with nonheterosexual romantic attractions may experience intense distress, evaluating themselves negatively and withdrawing from others.

Existing research has documented that sexual minority youth are indeed at a much greater risk of mental health problems, including depression (D'Augelli 2002; D'Augelli et al. 2002; Lock and Steiner 1999; Russell 2006). This is dramatically revealed in rates of suicide attempts, which are 2 to 3 times higher for gay, lesbian, and bisexual (GLB) identified youth (Garofalo et al. 1999) and same-sex attracted youth (Russell and Joyner 2001) than for heterosexual youth. In addition, same-sex attracted adolescents, especially boys, are more likely than their other-sex attracted peers to use harmful or illegal substances (Bontempo and D'Augelli 2002; Faulkner and Cranston 1998; Rostosky et al. 2003; Russell 2006; Russell, Driscoll, and Truong 2002), perhaps in an effort to relieve emotional distress. As youth with stigmatized romantic attractions may become depressed and begin to engage in harmful behaviors at a critical time of preparation for the transition to adulthood, these risk factors may translate into disadvantages that can have lasting effects on adult opportunities. Furthermore, because this stigma may be intensely felt within schools, same-sex attracted youth may withdraw from their teachers and peers and disengage from the learning process itself.

School Attachment, Engagement, and Academic Success

Stigmatized individuals may refrain from developing an attachment to the community that stigmatizes them (Goffman 1963). Sense of belonging is an important motivating factor (Akerlof and Kranton 2002; Finn 1989; Hirschi 1969; Johnson, Crosnoe, and Elder 2001); thus, adolescents who are stigmatized by the school environment may respond by becoming disengaged and detached from the educational process. Students who do not feel a sense of belonging within their schools, or who expect that others in their school would reject them if they knew of their attractions, may lose motivation to please their teachers and classmates. Consequently, these adolescents may become disengaged, not paying attention in class, failing to complete assignments, and even missing days of school altogether (Johnson et al. 2001). Furthermore, risk factors such as depression (Needham, Crosnoe, and Muller 2004; Wentzel 1994; Wentzel et al. 1990) and substance use (Chassin, Pitts, and DeLucia 1999; Crosnoe, Muller, and Frank 2004) may also lead students to become detached and disengaged from school, contributing even more to the difficulty faced by same-sex attracted youth. As active participation is necessary for learning to occur, this disengagement may lead adolescents with same-sex attraction to lower academic performance and decreased school success.

The importance of school attachment for educational success has been demonstrated in research on racial/ethnic and socioeconomic achievement gaps, and these studies may provide insight into the process through which stigmatization can lead to academic disadvantage. When students' characteristics do not align with the formal or informal structure of the school, their ability to negotiate this structure is compromised. In an effort to maintain their identity and avoid a loss of self worth, students who are stigmatized may disengage from their teachers, schools, and the learning process itself (Finn 1989). For example, functioning in a historically discriminatory context, African American boys may reject the dominant school culture and scholarly pursuits (Ferguson 2000; Fordham and Ogbu 1986; Ogbu 2003). Such opposition to the school may protect young people from internalizing a devalued identity but it also puts them at a disadvantage in the long run and ultimately reinforces the image of an ideal promoted by the school.

Despite the evidence that schools create a heterosexist environment that marginalizes and alienates adolescents who do not experience only heterosexual attractions, few studies have fully examined how sexual minority youth fare in academic terms. Some existing research suggests that the academic performance of same-sex attracted adolescents does suffer

(Rostosky et al. 2003; Russell, Seif, and Truong 2001). Stephen T. Russell, Hinda Seif, and Nhan L. Truong (2001) found that same-sex attraction impacted boys' school performance, as measured by self-reported grades, but they did not have available a full description of academic success. Our study will extend previous research by examining a broad spectrum of more precisely measured academic outcomes in an effort to more fully understand the difficulties experienced by same-sex attracted youth. Furthermore, we can examine whether this disadvantage persists, leaving a lasting impact on same-sex attracted students' achievement at the end of high school.

Measuring Academic Success

Grades are teachers' evaluations of students' effort and performance, reflecting both engagement and productivity as well as teacher expectations and possible bias. A student's overall grade point average (GPA) indicates the extent to which the student has met the demands of his or her courses and teachers' expectations. In addition, earning high grades helps students secure admission to competitive colleges and universities (Alexander, Holupka, and Pallas 1987). In contrast to overall GPA, course failure is an important indicator of academic risk and frequently precipitates dropping out of high school (Roderick 1993). Failure indicates that the student did not meet the minimum requirements of a course and did not receive credit toward high school graduation. Students who become depressed or detached from their school and their teachers may demonstrate poor academic performance, especially if they become disengaged from schoolwork or begin missing days of school (Needham et al. 2004).

As students progress through high school, courses become increasingly differentiated with respect to both demands and complexity. Although students in more demanding courses generally earn higher grades, to some extent grades are assigned relative to other students in the course; thus, it is possible for students in the lower level to graduate from high school with high grades (Perkins et al. 2004). Accordingly, an evaluation of students' academic success must take into account not only their grades but also the level of coursework, an important additional dimension of postsecondary opportunity (Adelman 1999). Failing to complete advanced coursework in mathematics, science, and foreign language reduces a student's chances of obtaining postsecondary education. Not only do these courses prepare students for college entrance exams (Pallas and Alexander 1983), many four-year colleges and universities require these courses for admission (Adelman 1999). The decision to enroll in advanced courses is based both on students' actual performance in other courses within that subject as well as on the encouragement of teachers and school counselors. Sexual minority youth who are not socially integrated in their schools might not just have lower grades but may disengage from more demanding curriculum as well.

Gender and Academic Success

Adjusting within heterosexist school environments may be more difficult for boys than for girls who experience same-sex attractions. Gender nonconformity, including nonheterosexual feelings and behaviors, is perceived more negatively among boys than girls (D'Augelli et al. 2002; Martin 1990), as suggested by the connotations carried by the labels "tomboy" and "sissy." Furthermore, norms of appropriate femininity allow for affection between female friends in a way that norms of masculinity do not (D'Augelli 1998). Boys with same-sex attraction may also be more at risk than sexual minority girls for substance abuse and suicide because they may be more likely to externalize stress (Leadbeater et al. 1999; Savin-Williams 1990).

Gender differences may also be reflected in measures of academic success. Girls are generally more likely than boys to take on the role of good student: they typically earn higher grades and are much less likely to fail courses (American Association of University Women 1999;

Orenstein 1994; Sadker and Sadker 1994). Furthermore, while boys are believed to externalize frustration, girls are more likely to internalize stress, and girls' internal struggles are often not reflected in their grades (Sadker and Sadker 1994). While we do not know if some girls develop an oppositional culture, most of the work on school disidentification and rejection reflects the experiences of boys (Fordham and Ogbu 1986), suggesting that boys may be more likely to disengage if they feel marginalized by the school. Accordingly, experiencing stigmatized romantic attractions may impact boys' academic success more strongly than that of girls.

Current Study

In sum, previous research suggests that because nonheterosexual feelings are stigmatized, adolescents who experience same-sex attraction may become distressed and withdrawn. The academic performance and future educational opportunities of these students are likely to suffer, in part because they may become depressed or begin using harmful substances, and also because they may detach and disengage from school. In this study, we employ new data collected by the Adolescent Health and Academic Achievement (AHAA) study to examine whether same-sex attracted youth have compromised academic outcomes as they leave high school. We will attempt to explain this lower educational performance by examining the role of risk factors, such as emotional distress and substance use, and social integration at school, as measured by school attachment, disengagement, and relationships with teachers. Finally, because of the significant role gender plays in both the formation of sexual identity (Savin-Williams and Diamond 2000) and educational experiences (American Association of University Women 1999; Correll 2001; Orenstein 1994; Sadker and Sadker 1994), we will explore whether these relationships vary by gender.

Data and Methods

In order to examine the academic success of same-sex attracted youth, we employed data from the National Longitudinal Study of Adolescent Health (Add Health) and the Adolescent Health and Academic Achievement (AHAA) data sets. Add Health is a nationally representative, school-based study of 20,745 students in grades 7 through 12 that contains data on adolescents' romantic attractions, well-being, and attitudes toward school. The Add Health sample was drawn from a random sample of high schools in the United States that were stratified by region, urbanicity, size, type, racial composition, and grade span. Students were selected from these 80 high schools and their feeder middle schools to participate in in-home interviews that were conducted in 1995 (Wave I), 1996 (Wave II), and 2001 (Wave III).

Earlier research on sexual minority youth was conducted with small convenience samples, and the few representative samples that did exist were geographically limited. Add Health was the first nationally representative sample of youth to include any information on sexual orientation; therefore, it offered the first opportunity to assess the degree and extent of problems faced by sexual minority adolescents nationwide. In addition, Add Health includes information on several domains of adolescents' lives, including psychological well-being, relationships with parents and peers, and attitudes toward teachers and school. The AHAA study expanded Add Health to include detailed measures of curricular exposure, academic performance, and achievement (Muller et al. 2007). During the 2001 Add Health data collection effort, the AHAA study obtained consent to collect high school transcripts from the high schools last attended by Wave III respondents. In 2002–2003, transcripts were collected and coded for approximately 81 percent of the Wave III Add Health sample. These AHAA data provide indicators of educational achievement, course-taking patterns, and educational contexts within and between schools to be linked to the Add Health survey data.

The present study was confined to respondents who participated in the Wave I in-home interview as well as the AHAA transcript study, had complete transcript information, and had

a valid sampling weight. In addition, we excluded students who did not respond to questions addressing sexual attraction or educational experiences. Finally, we dropped from analyses respondents who were missing on key independent variables. The final number of respondents in this study was 11,288 (5,947 females and 5,341 males). Descriptive statistics for the excluded respondents as well as for our final sample are presented in the Appendix.

Measures

Romantic Attraction—Our measure of same-sex attraction was based on two questions from the Wave I in-home survey that asked the respondent whether he or she had ever had a romantic attraction to a female and to a male. We consider same-sex attracted youths those that reported ever having been attracted to a person of the same sex, regardless of whether they also reported other-sex attractions. Students who reported that they had never been romantically attracted to a male or female were included in analyses as a separate category. Other-sex attracted adolescents served as a reference group in all models. Add Health interviewers used Audio-CASI (audio computer-aided self-interview) during this section of the questionnaire, which may increase the numbers of youth reporting same-sex attraction, as this interview technique reduces the degree of interviewer or parental influence on responses.

Add Health does not include information on sexual identity during adolescence. Add Health did ask about respondents' sexual identity in the Wave III interview, conducted when the overwhelming majority of respondents had completed high school.¹ However, our study focuses on the academic consequences of experiencing stigmatized sexual or romantic feelings during adolescence, and it is thus essential to have measures of sexual orientation during adolescence while respondents were still in school. Furthermore, given that sexuality is in development during adolescence (Russell 2006), romantic attraction is a more developmentally-appropriate measure of sexual orientation. Many adolescents who experience same-sex desires will never identify as gay, lesbian, or bisexual (Savin-Williams 2001; Savin-Williams 2005); therefore, our romantic attraction measure most likely reveals both self-identified GLB youth as well as those who do not, and may never, identify as such. Finally, a stigmatized attribute, such as a romantic attraction to someone of the same sex, does not have to define a person's identity in order to be stigmatizing (Goffman 1963). Using romantic attraction rather than self-identification as a measure of sexual orientation allows us to include a greater number of youth who may also experience sexual stigma.

Educational Outcomes—All educational outcomes were constructed using the students' high school transcripts that were collected by the AHAA study. We considered several outcomes of academic success and preparation for postsecondary education, including grades, course failure, and course taking in math, science, and foreign language.

Grade point average (GPA) was calculated by first averaging all of the grades (which were weighted by the amount of course credit) that appeared on the student's high school transcript for each year of high school and then taking the mean across all years. This variable is continuous, ranging from 0 to 4. Our second outcome variable was *course failure*, a dichotomous measure that indicates whether or not the student failed any course during high school.

In order to assess adolescents' preparation for postsecondary education, we measured advanced course taking in three subject areas: mathematics, science, and foreign language. High school courses in mathematics, foreign language, and to a lesser degree science, are hierarchically

¹The correspondence between this measure and adolescent romantic attraction was low: only 25 percent of respondents who reported at Wave III that they considered themselves mostly gay, lesbian, or bisexual also reported a same-sex attraction in the Wave I interview.

organized in sequences in which knowledge gained in one course is necessary to proceed to the next course. Ending high school with more advanced courses improves students' opportunities for postsecondary education, and most four-year colleges require that students complete certain levels of coursework in each subject. In general, a student must complete algebra II, chemistry, and two years of foreign language in order to attend a selective college. Our measures of course taking were three dichotomous outcomes that indicate whether or not a student received credit (as indicated by their transcript) for each of these key courses by the end of high school.

While one could create an index measuring advanced coursework across these subjects, we chose to separate them for several reasons. While some subjects, such as math and science, are typically seen as more masculine, others, such as language, are perceived to be more feminine (Correll 2001; Sadker and Sadker 1994). Though recent research suggests that gender gaps in course taking within these subjects are closing (American Association of University Women 1999), gendered perceptions of specific courses may still influence students' decisions to enroll in them. Students who do not conform to norms of appropriate gendered behavior in one aspect of their lives (that is, by reporting nonheterosexual romantic attractions) may be less inclined to conform in other areas. In addition, some subjects are simply seen as more difficult and more competitive (and these are frequently those described as more masculine), and students who feel disconnected from their schools may be less likely to enroll in advanced courses in these subjects than in others. For these reasons, it is useful to compare same-sex attracted youths' course taking between different subjects.

Social Integration at School—All measures of social integration at school were constructed using questions from the Wave I in-home survey. Adolescents' feelings of *school attachment* were measured using three questions that asked respondents the extent to which they felt a part of the school, happy to be at their school, and close to people at their school (Cronbach's $\alpha = .785$). Responses were coded from 1 to 5 (low to high) and were averaged (Moody and White 2003). *Teacher attachment* measured the degree to which a student had trouble getting along with teachers, believed teachers treated students fairly at their school, and felt that teachers cared about her or him ($\alpha = .636$). These questions were coded from 1 to 5, with 5 indicating high levels of teacher attachment, and were averaged (Crosnoe, Johnson, and Elder 2004). Our measure of *disengagement from school* was based on three questions regarding how often the adolescent had difficulty paying attention in class and getting homework done and how many times he or she had skipped school ($\alpha = .587$) (Johnson et al. 2001). Responses to the first two questions were coded from 0 (never) to 4 (everyday), and we collapsed responses to the third item into five categories: 0 (never), 1 (1 to 2 days), 2 (3 to 5 days), 3 (6 to 9 days), and 4 (10 or more days). *Educational expectations* assessed adolescents' perceived ability to attend college. Responses to this ordinal variable ranged from very unlikely to very likely (1 to 5).

Risk Factors—Adolescents with nonheterosexual feelings, identities, and behaviors have been shown to be at greater risk for emotional distress and substance use (Bontempo and D'Augelli 2002; Faulkner and Cranston 1998; Lock and Steiner 1999; Russell 2006; Russell et al. 2002; Russell, Franz, and Driscoll 2001), which may be linked to academic success as well (Chassin et al. 1999; Crosnoe et al. 2004; Needham et al. 2004; Wentzel 1994; Wentzel et al. 1990). *Emotional distress*, measured at Wave I, was assessed using 19 items from the Center for Epidemiological Studies' Depression scale (CES-D) that measured both malaise and mood aspects of emotional distress. Responses to the items were averaged to form a single continuous indicator of depressive symptoms ($\alpha = .865$) that ranges from 0 to 3. *Substance use* ranges from 0 to 4 and indicates the number of substances an adolescent had reported using by the time of the Wave I survey, including tobacco, alcohol, marijuana, or other illegal drugs ($\alpha = .687$).

Control Variables—In all models we controlled for student's background characteristics, including racial/ethnic identity, grade level, parents' highest level of education, family structure, and cognitive ability. All control variables were measured using the Wave I in-home interview. Racial/ethnic identity could be reported as non-Latino/a white, African American, Latino/a, Asian or Pacific Islander, and other. Respondents ranged from grade 7 to 12. Parents' highest level of education was taken from the parent questionnaire (administered at the time of the Wave I interview) and indicates the highest level of education of each parent in the household. In this study we used the report from the resident parent with the higher education level. If the parent questionnaire was not administered (or if the response was missing) we substituted the parent's education level reported by the adolescent. We coded parents' highest education level as an ordinal variable ranging from 0 to 5 indicating that he or she never attended school, did not complete high school, was a high school graduate or equivalent, completed some college, earned a four-year college degree, or obtained professional training beyond a four-year college degree.² Family structure was measured using adolescent reports of household composition (during the Wave I survey) and was grouped into four categories, including two biological parents, stepfamily, single parent family, and other family structure. Finally, we accounted for student's cognitive ability using the Picture Vocabulary Test (PVT) score. An abridged version of the Peabody Picture Vocabulary Test was administered to Add Health respondents, and their scores were standardized.³

Analytical Plan

First we examined how same-sex attracted youth and other-sex attracted youth differed on educational outcomes and independent variables of interest in order to examine whether same-sex attraction is associated with lower academic performance and school attachment and engagement. We present means and standard deviations on these variables for same-sex and other-sex attracted youth. We next attempted to explain differences in academic success by examining the impact of various measures of social integration at school on academic outcomes using multivariate models that controlled for prior risk factors. We present models before and after including these measures of social integration in order to assess whether they account for some of the impact of same-sex attraction. For our continuous outcome of grade point average we used OLS regression. All other outcomes are dichotomous; therefore, we estimated logistic regression models. Because of the importance of gender in issues of education and sexual orientation, all analyses were performed separately for boys and girls. All analyses were weighted using the svy procedure in STATA to take into account the clustered sampling design of the data.

Results

First, we examine romantic attraction differences in educational outcomes, risk factors, and social integration at school. As shown in Table 1, both boys and girls reporting a same-sex romantic attraction fare worse on most measures of academic achievement compared to their other-sex attracted peers. Overall, they leave high school with lower grades, are more likely to have failed a course, and are less likely to have completed algebra II and chemistry. Compared to their other-sex attracted peers, adolescents with nonheterosexual attractions report greater levels of emotional distress and substance use. Same-sex attracted youth also appear less socially integrated in their schools: they report feeling less attached to their schools

²Missing values for parents' education level ($n = 136$) were imputed with the IMPUTE command in STATA, using parent's occupation and the average level of parents' education in the respondent's school as predictors, and indicators of this substitution were included in all models.

³Missing values for PVT ($n = 508$) were imputed with the IMPUTE command in STATA. Predictors included gender, racial/ethnic identity, parents' highest level of education, generational status, and language spoken at home. Indicators of this substitution were included in all models.

and teachers, have greater difficulty engaging in school, and have lower expectations of attending college compared to adolescents who are only attracted to the other sex. Overall, romantic attraction group differences in academic performance are larger for boys, but attraction differences in risk factors, attitudes toward school, and engagement in school are larger for girls.

We next turn to multivariate models to assess whether same-sex attraction is associated with academic success net of confounding factors such as student's background characteristics and risk factors such as emotional distress and substance use. First, we examine how same-sex attracted youth are evaluated in terms of meeting course demands and teacher expectations. For girls, same-sex attraction is not significantly related to GPA or course failure after controlling for background characteristics (as shown in Model 1 of Tables 2 and 3). Same-sex attracted boys, however, have lower GPAs than their other-sex attracted peers, even after accounting for background characteristics (Table 2, Model 1).⁴ This disadvantage appears small, approximately one quarter of a letter grade, but given the number of courses a student has taken by the end of high school, it is substantial. For example, for a student taking eight courses each year over four years, a difference of one quarter of a letter grade in GPA could come about from a full letter grade difference (e.g., B versus C) in two courses each year, or a full letter grade in all courses during one year. Alternatively, it could represent a decrease of two letter grades (e.g., B versus D) in one particular subject each year. Furthermore, this disadvantage persists even after taking into account the higher levels of emotional distress and substance use experienced by these youth (Model 2). Sexual minority boys' lower GPAs appear to be partly a result of these risk factors as well as less social integration in their schools, particularly lower teacher attachment and educational expectations and higher levels of disengagement (Model 3). Furthermore, the impact of emotional distress is no longer significant after including these social integration variables into the model. However, there is a remaining disadvantage (about one sixth of a letter grade) experienced by these adolescents that is not explained by these factors.

Sexual minority boys are also approximately 51 percent more likely than their heterosexual peers to fail a course during high school (Table 3, Model 1), indicating they sometimes have difficulty meeting even the minimum requirements of their courses. This relationship between same-sex attraction and the likelihood of failing a course is mostly a result of same-sex attracted boys' greater risk of emotional distress and substance use (Model 2), though disengagement from school and educational expectations also play a role (Model 3). As with GPA, emotional distress appears to influence the likelihood of failing a course because of its association with disengagement and college expectations.

We next explore how well same-sex attracted youth are prepared for postsecondary education by examining the degree to which they engage in more demanding coursework. Results for course taking in mathematics, science, and foreign language are presented in Table 4 and show a similar pattern to those found for GPA and course failure. Same-sex attracted girls are approximately 36 percent less likely than girls without same-sex attractions to complete algebra II, and this is due to their higher levels of emotional distress and substance use (Model 2), which may in turn shape their ability to engage in school (Model 3). However, same-sex attraction is not related to girls' science and foreign language course taking (Model 1).

Among boys, those with same-sex attractions are less likely than other-sex attracted boys to complete both algebra II and chemistry (Model 1), important courses that prepare high school

⁴In order to test for significant differences in results between boys and girls, we estimated models (not shown) with the pooled sample that included interaction terms between gender and same-sex attraction. In only one case was this interaction term statistically significant: the estimated effect of same-sex attraction on GPA is significantly larger for boys than for girls.

students for college entrance exams and college admission. Compared to students with only other-sex attractions, same-sex attracted boys are approximately 47 percent less likely to complete algebra II and 41 percent less likely to complete chemistry. Our results suggest that these boys may disengage from more demanding curriculum in part because they are at greater risk of emotional distress and substance use (Model 2). Being less socially integrated, in terms of feeling less attached and engaged in their schools, does not explain the relationship between romantic attraction and math and science coursework (Model 3), as same-sex attracted boys continue to have lower odds of completing algebra II (43 percent lower odds) and chemistry (34 percent lower odds), even after taking these factors into account. However, these factors do seem to explain the relationship between emotional distress and course taking. Like girls, same-sex attraction is unrelated to advanced foreign language course taking for boys.

Discussion

This study provides new information about school-related difficulties experienced by sexual minority youth. Previous research has found a link between sexual orientation and academic performance (Rostosky et al. 2003; Russell, Seif, and Truong 2001); however, existing data has not allowed researchers to examine whether it is only the grades of students with stigmatized romantic attractions that suffer or whether these adolescents are also failing courses or leaving school unprepared for postsecondary education. Our study uses newly collected, nationally representative educational data to provide evidence that same-sex attracted youth are indeed suffering in schools in ways that can impact their opportunities for future success. Experiencing sexual stigma can lead to emotional distress and risk-taking and can prevent these adolescents from feeling like they belong in their schools, ultimately impacting their academic performance.

Our findings reveal that same-sex attracted youth indeed report feeling less socially integrated in their schools. Both boys and girls with same-sex romantic attractions feel less connected to their schools than their peers who experience only heterosexual attractions. This is not surprising given previous research on the heterosexist and homophobic climates that exist in many schools (Bontempo and D'Augelli 2002; D'Augelli et al. 2002; Human Rights Watch 2001; Pilkington and D'Augelli 1995). Furthermore, the emotional distress experienced by same-sex attracted adolescents may lead them to feel isolated, and may interfere with their ability to actively engage in the classroom. These adolescents report experiencing greater difficulty paying attention in class and completing assignments, and they skip classes more often. Same-sex attracted youth likely recognize that their romantic attractions do not fit with the representation of "normal" sexuality promoted by the school, and they may respond to the implication that something is wrong with them by becoming withdrawn and distancing themselves from the school and, consequently, the learning process itself (Akerlof and Kranton 2002).

Our study also reveals that sexual minority youth, particularly boys, exhibit lower levels of academic performance during high school and leave less prepared for postsecondary education. Same-sex attracted boys receive lower grades than their other-sex attracted peers, suggesting that they have greater difficulty meeting the requirements of their courses and the expectations of their teachers. Further, these boys are more likely to fail to meet even the minimum demands necessary to pass a course and receive credit toward graduation. Same-sex attracted boys disengage from more demanding curriculum as well, choosing to take fewer advanced courses in math and science. While advanced course taking is not directly related to academic achievement, it is an important predictor of future opportunity as most four-year colleges and universities require prerequisites in several subjects. Interestingly, same-sex attracted boys are not less likely than their other-sex attracted peers to enroll in multiple years of foreign language coursework, suggesting that in some subjects they do exceed basic requirements for high school

graduation and take on an academic challenge. This suggests there may be something unique about mathematics and science that makes them more intimidating than other subjects. Research on gender differences in attitudes toward and participation in math and science courses revealed that these subjects are often perceived to be more demanding and competitive, and the classroom environments in these courses can even be hostile and unsupportive (Sadker and Sadker 1994). These characteristics were identified as factors that worked to keep girls and racial/ethnic minorities from excelling in these subjects (Catsambis 1994; Clewell and Ginorio 2002) and may explain why sexual minority boys are also less likely to enroll in these courses.

For the most part, same-sex attracted girls do not exhibit the same academic problems as their male counterparts despite their increased emotional distress and lack of social integration at school. These findings are consistent with previous research that finds that girls tend to internalize distress while boys are more likely to externalize distress (Leadbeater et al. 1999) as well as with research that finds that girls are more likely to take on the good student role (Orenstein 1994; Sadker and Sadker 1994). There was one exception: same-sex attracted girls are less likely to complete algebra II, a course often required for admission to college and one that is likely to improve a student's performance on entrance exams.

Though social integration and risk factors such as depression and substance use do play a role in the academic performance of sexual minority boys, our findings do not offer a clear explanation for their lower academic success. Our results do suggest that same-sex attracted youth have less positive feelings about their teachers, and because existing research suggests that some teachers may express disapproval of GLB students (Human Rights Watch 2001), it is possible that negative attitudes toward teachers and school staff could reflect a response to distressing interactions with these adults. Teachers reward students who conform to ideals promoted by the school and penalize others who do not (Akerlof and Kranton 2002), and teachers' judgments about students' skills can become entangled with cultural signals that have little to do with students' productivity (Carter 2003; Farkas 2003). It is thus possible that the unexplained disadvantage of same-sex attracted youth could be due to bias in teachers' and administrators' evaluations of their performance and potential (with respect to more demanding curriculum).

This explanation would only apply to students whose romantic attractions, or sexual identity, were in some way visible to teachers, and we cannot tell this from our data. In addition, sexual minority youth whose nonheterosexual attractions, behaviors, or identities are visible to their peers may experience additional barriers to full participation in the classroom, such as verbal and physical harassment by other students. Factors outside of school may also impact same-sex attracted students' ability to succeed. For example, the family plays an important role in adolescents' academic achievement (Muller 1993; Muller 1995), and adolescents with same-sex attractions may withdraw from their parents as they do from their school. Future research is needed to understand how sexual minority youths' academic success is hindered by their social environments.

This leads us to an important source of heterogeneity among the sexual minority youth in our study: the degree to which the nonheterosexual feelings they experience are incorporated into their sexual behaviors or identity and the extent to which their stigma is visible within the school. GLB-identified students who are out to others as well as youth who display nontraditional gendered behavior are more often targets of homophobia; therefore, the processes through which their academic success is impacted may be different, as they may be more susceptible to teacher bias and social isolation at school. On the other hand, accepting a stigmatized identity and revealing that identity to others requires self-confidence, an important

social-psychological resource that may protect these adolescents from some of the harmful consequences of a heterosexist environment.

Our measure of same-sex attraction does not differentiate adolescents with only same-sex attractions from those who are attracted to both boys and girls, but this may be a meaningful distinction. Previous research has suggested that among sexual minority youth, there are differences between adolescents with bisexual attractions and those who are only romantically attracted to the same sex. For example, youth with bisexual attractions may be more prone to school-related problems and risk-taking behavior (Murdock and Bolch 2005; Russell 2006; Russell et al. 2002; Russell, Seif, and Truong 2001). Indeed, analyses not shown here do suggest that adolescents who report being romantically attracted to both sexes may indeed experience greater difficulty in school. However, fewer adolescents report same-only attractions (69 girls and 40 boys) than report being romantically attracted to both males and females (211 girls and 308 boys). We thus could not be confident that these differences were not the result of the smaller numbers of adolescents in the same-only attracted group.

Previous research has found that age as well as race and ethnicity are important factors to consider in research on sexual orientation, as differences in developmental trajectories and outcomes may exist for younger adolescents and youth of different racial/ethnic backgrounds (Russell and Truong 2001; Savin-Williams 2001). Because our study does not establish temporal order, we would be unable to disentangle whether age differences are developmental, or whether they are a result of the different educational trajectories of older and younger students. Furthermore, an adequate examination of racial/ethnic differences is beyond the scope of this study, particularly because of the small number of same-sex attracted youth in this sample.

Overall, our ability to explore these differences among sexual minority youth is limited due to the small number of same-sex attracted adolescents in our sample as well as to limited information about their sexual identity and related experiences. Though we employ a large, nationally representative sample, we are unable to fully explore the variation among same-sex attracted adolescents without oversamples of this population; this deficiency calls attention to the need for more data targeting same-sex attracted adolescents. Despite these limitations, our study provides concrete evidence that sexual minority youth are suffering in schools in ways that can impact their future success. The emergence of sexual feelings and roles can be a struggle for all adolescents, but for adolescents who experience stigmatized attractions, this can escalate to feelings of alienation and social isolation. As this time period is especially important for preparing for future success, these consequences can have lasting effects. Schools are important institutions in the lives of adolescents that have great power in shaping their developmental trajectories; therefore, they have significant potential in preventing sexual minority youth from becoming disengaged and educationally disadvantaged.

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Appendix

Descriptive Statistics for Wave I and Final Samples

	<i>All Wave I</i>		<i>Final Sample</i>	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
Romantic attraction				
Same sex	.06		.06	
Other sex only	.82		.83	
No attraction	.12		.11	
Emotional distress	.60	.40	.58	.39
Substance use	1.55	1.28	1.49	1.27
School attachment	3.73	.87	3.77	.85
Teacher attachment	3.71	.77	3.74	.74
Disengagement from school	1.03	.82	.99	.78
Educational expectations	4.13	1.16	4.23	1.10
Race/ethnicity				
Non-Latino/a white	.50		.54	
African American	.23		.20	
Latino/a	.17		.15	
Asian or Pacific Islander	.07		.08	
Other	.03		.03	
Grade level	9.69	1.63	9.67	1.61
Parents' highest education level	2.84	1.27	2.93	1.27
Family structure				
Two biological parents	.50		.56	
Stepfamily	.19		.17	
Single parent family	.25		.22	
Other family structure	.07		.05	
Picture Vocabulary Test score	99.66	15.17	101.57	14.14
<i>N</i>	20745		11288	

Sources: The National Longitudinal Study of Adolescent Health (Udry 2003) and the Adolescent Health and Academic Achievement study (Muller et al. 2007)

Notes: Presented statistics are unweighted. Respondents without transcript data do not have a valid sampling weight; therefore, we present unweighted means and standard deviations for both groups for comparative purposes.

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Table 1

Weighted Descriptive Statistics by Romantic Attraction for Girls and Boys

	Girls						Boys											
	Other Sex Only			Same Sex			No Attraction			Other Sex Only			Same Sex			No Attraction		
	Mean	SD		Mean	SD		Mean	SD		Mean	SD		Mean	SD		Mean	SD	
Grade point average	2.74	.76		2.63	.82 [†]		2.68	.86		2.45	.87		2.09	1.00 [†]		2.28	.90 [†]	
Course failure	.43	—		.51	— [†]		.45	—		.56	—		.69	— [†]		.62	—	
Algebra II	.65	—		.57	— [†]		.59	— [†]		.59	—		.41	— [†]		.44	— [†]	
Chemistry	.68	—		.63	— [†]		.63	— [†]		.63	—		.47	— [†]		.48	— [†]	
Two years foreign language	.65	—		.64	—		.54	— [†]		.53	—		.46	—		.36	— [†]	
Emotional distress	.60	.40		.78	.44 [†]		.57	.42 [†]		.51	.36		.61	.43 [†]		.52	.36	
Substance use	1.51	1.20		2.44	1.28 [†]		.76	1.04 [†]		1.61	1.30		1.85	1.36 [†]		.92	1.14 [†]	
School attachment	3.77	.85		3.37	1.00 [†]		3.84	.85 [†]		3.80	.87		3.68	.96 [†]		3.80	.87	
Teacher attachment	3.75	.70		3.46	.74 [†]		4.00	.74 [†]		3.69	.81		3.56	.90 [†]		3.90	.82 [†]	
Disengagement from school	.89	.69		1.29	.88 [†]		.68	.72 [†]		1.08	.84		1.29	.99 [†]		.87	.83 [†]	
Educational expectations	4.35	.99		4.22	1.05 [†]		4.22	1.15 [†]		4.15	1.17		3.99	1.41 [†]		3.89	1.34 [†]	
Race/ethnicity																		
Non-Latino/a white	.68	—		.60	— [†]		.61	— [†]		.67	—		.60	— [†]		.61	— [†]	
African American	.16	—		.15	—		.21	— [†]		.15	—		.20	—		.20	— [†]	
Latino/a	.10	—		.14	— [†]		.11	—		.11	—		.15	— [†]		.11	—	
Asian or Pacific Islander	.03	—		.04	—		.06	—		.04	—		.02	—		.07	—	
Other	.03	—		.07	— [†]		.02	—		.04	—		.03	— [†]		.02	—	
Grade level	9.53	1.61		10.11	1.58 [†]		8.57	1.67 [†]		9.59	1.74		9.56	1.81		8.64	1.74 [†]	
Parents' highest education level	2.91	1.19		2.86	1.23		2.69	1.28 [†]		2.96	1.27		2.72	1.49 [†]		2.63	1.31 [†]	
Family structure																		
Two biological parents	.57	—		.51	—		.58	—		.58	—		.49	—		.61	—	
Stepfamily	.17	—		.16	—		.15	—		.16	—		.14	—		.15	—	
Single parent family	.22	—		.25	—		.20	—		.20	—		.26	—		.20	—	

Sources: The National Longitudinal Study of Adolescent Health (Udry 2003) and the Adolescent Health and Academic Achievement study (Muller et al. 2007)

[†]The mean is significantly different from the mean for other-sex attraction at the $p < .05$ level (two-tailed tests). Differences were assessed using t -tests for ordinal and continuous variables and chi-square tests for categorical variables.

Table 2

Coefficients from OLS Regressions Predicting Grade Point Average

	Girls (N = 5,919)			Boys (N = 5,307)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Romantic attraction						
Same sex	-.10	.04	.07	-.24***	-.19***	-.17***
No attraction	.10*	.01	.00	.01	-.06	-.05
Emotional distress		-.20***	-.02		-.18***	.09
Substance use		-.14***	-.09***		-.15***	-.09***
School attachment			.00			.02
Teacher attachment			.10***			.07**
Disengagement from school			-.15***			-.21***
Educational expectations			.12***			.12***
Race/ethnicity						
African American	-.26***	-.32***	-.33***	-.22**	-.28***	-.33***
Latino/a	-.14**	-.17**	-.15**	.01	.00	-.03
Asian or Pacific Islander	.27**	.23**	.19**	.28**	.24**	.18*
Other	-.13	-.13	-.15*	-.18	-.14	-.08
Grade level	.01	.04***	.04***	.02	.05***	.06***
Parents' highest education level	.14***	.14***	.12***	.15***	.15***	.12***
Family structure						
Stepfamily	-.15***	-.08**	-.08**	-.25***	-.19***	-.15***
Single parent family	-.16***	-.10**	-.09**	-.27***	-.21***	-.16***
Other family structure	-.29***	-.21**	-.17*	-.29***	-.23**	-.18*
Picture Vocabulary Test score	.02***	.02***	.01***	.02***	.01***	.01***
Intercept	.56	.79	.05	.39	.46	-.30
R ²	.28	.34	.39	.24	.29	.36

Sources: The National Longitudinal Study of Adolescent Health (Udry 2003) and the Adolescent Health and Academic Achievement study (Muller et al. 2007)

$p < .001$ (two-tailed tests)

 $p < .01$
**
 $p < .05$
*

Table 3

Odds Ratios from Logistic Regression Predicting a Course Failure

	Girls (N = 5,919)			Boys (N = 5,307)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Romantic attraction						
Same sex	1.36	.97	.92	1.51*	1.35	1.29
No attraction	.83	1.03	1.08	.91	1.05	1.00
Emotional distress		1.48**	.95		1.82***	1.01
Substance use		1.42***	1.27***		1.36***	1.23***
School attachment			.94			.90
Teacher attachment			.75***			.94
Disengagement from school			1.46***			1.58***
Educational expectations			.82***			.78***
Race/ethnicity						
African American	1.44*	1.72**	1.73**	1.58	1.79*	2.02**
Latino/a	1.80*	1.98**	2.01**	1.27	1.27	1.37
Asian or Pacific Islander	.59*	.67	.71	.83	.88	1.02
Other	1.92*	1.99*	2.08*	1.69*	1.61	1.50
Grade level	.98	.92*	.91**	.95	.87***	.85***
Parents' highest education level	.73***	.73***	.74***	.70***	.70***	.73***
Family structure						
Stepfamily	1.56***	1.36**	1.38**	1.85***	1.66***	1.56***
Single parent family	1.74***	1.53***	1.53**	1.57***	1.40**	1.26
Other family structure	1.99**	1.70*	1.61	2.69***	2.36**	2.19**
Picture Vocabulary Test score	.97***	.97***	.97***	.97***	.97***	.97***
-2 log likelihood	7199.37	6933.07	6719.83	6396.07	6188.62	5975.39
Pseudo R ²	.11	.15	.16	.12	.14	.17

Sources: The National Longitudinal Study of Adolescent Health (Udry 2003) and the Adolescent Health and Academic Achievement study (Muller et al. 2007)

$p < .001$ (two-tailed tests)

 $p < .01$
**
 $p < .05$
*

Table 4

Odds Ratios from Logistic Regressions Predicting Course Taking

	<i>Algebra II</i>					
	<i>Girls (N = 5,947)</i>			<i>Boys (N = 5,341)</i>		
	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>
Romantic attraction						
Same sex	.64*	.87	.88	.53***	.57**	.57**
No attraction	1.12	.92	.94	.74*	.66**	.73*
Emotional distress		.54***	.77		.57***	.95
Substance use		.76***	.82***		.82***	.89*
School attachment			1.07			1.26***
Teacher attachment			1.05			.97
Disengagement from school			.82**			.79**
Educational expectations			1.53***			1.50***
Race/ethnicity						
African American	1.30	1.16	1.11	1.14	1.06	.93
Latino/a	1.10	1.06	1.07	1.17	1.18	1.09
Asian or Pacific Islander	2.98*	2.74*	2.45*	2.82**	2.81**	2.41*
Other	1.00	1.01	.93	.73	.78	.84
Grade level	1.05	1.12**	1.12**	1.04	1.11**	1.12**
Parents' highest education level	1.43***	1.42***	1.33***	1.44***	1.45***	1.32***
Family structure						
Stepfamily	.66***	.74**	.75**	.46***	.50***	.53***
Single parent family	.81	.93	.95	.60***	.65**	.73*
Other family structure	.46***	.53**	.60*	.42***	.46***	.50***
Picture Vocabulary Test score	1.05***	1.05***	1.05***	1.05***	1.05***	1.05***
-2 log likelihood	6708.24	6483.12	6239.95	6170.91	6056.92	5771.67
Pseudo R ²	.14	.17	.20	.16	.17	.21

<i>Chemistry</i>				
Romantic attraction				
Same sex	.77	1.09	1.16	.59**
No attraction	1.14	.93	.93	.75*
Emotional distress		.51***	.80*	.51***
Substance use		.74***	.82***	.77***
School attachment			1.17*	1.15
Teacher attachment			1.18*	.95
Disengagement from school			.80**	.69***
Educational expectations			1.47***	1.51***
Race/ethnicity				
African American	1.42	1.26	1.25	1.38
Latino/a	1.18	1.14	1.14	1.55*
Asian or Pacific Islander	3.12**	2.86**	2.53**	3.32***
Other	.89	.89	.83	.69
Grade level	1.04	1.11**	1.12**	1.06
Parents' highest education level	1.43***	1.43***	1.34***	1.44***
Family structure				
Stepfamily	.67***	.75*	.75*	.56***
Single parent family	.87	1.02	1.04	.59***
Other family structure	.42***	.49**	.54*	.55***
Picture Vocabulary Test score	1.05***	1.05***	1.04***	1.05***
-2 log likelihood	6618.11	6352.31	6075.18	5981.40
Pseudo R^2	.12	.16	.19	.14
				.17
				.21
<i>Two Years Foreign Language</i>				
Romantic attraction				
Same sex	.92	1.22	1.27	.95
No attraction	.88	.74*	.74	.67**
				1.05
				.61***
				.65**

Two Years Foreign Language

Emotional distress	.53***	.75*	.55***	.80
Substance use	.80***	.85**	.81***	0.86**
School attachment		1.13*		1.15*
Teacher attachment		1.20**		1.09
Disengagement from school		.99		.96
Educational expectations		1.49***		1.52***
Race/ethnicity				
African American	1.35	1.23	1.27	1.19
Latino/a	2.51***	2.61***	2.86***	2.93***
Asian or Pacific Islander	4.05***	3.39***	5.72***	5.83***
Other	.93	.89	.93	1.00
Grade level	1.04	1.09	1.04	1.10*
Parents' highest education level	1.48***	1.38***	1.51***	1.38***
Family structure				
Stepfamily	.70**	.78*	.64***	.69**
Single parent family	.95	1.10	.55***	.60***
Other family structure	.47***	.60*	.42***	.46**
Picture Vocabulary Test score	1.06***	1.05***	1.05***	1.05***
-2 log likelihood	6663.17	6476.97	6212.16	6085.86
Pseudo R^2	.14	.20	.16	.18
				.21

Sources: The National Longitudinal Study of Adolescent Health (Udry 2003) and the Adolescent Health and Academic Achievement study (Muller et al. 2007)

*
 $p < .05$

**
 $p < .01$

 $p < .001$ (two-tailed tests)