Integrated Schools, Segregated Curriculum: Effects of Within-School Segregation on Adolescent Health Behaviors and Educational Aspirations

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Objectives. We examined the extent to which within-school segregation, as measured by unevenness in the distribution of Black and White adolescents across levels of the English curriculum (advanced placement–international baccalaureate–honors, general, remedial, or no English), was associated with smoking, drinking, and educational aspirations, which previous studies found are related to school racial/ethnic composition.

Methods. We analyzed data from wave 1 of the National Longitudinal Study of Adolescent Health, restricting our sample to non-Hispanic Blacks (n=2731) and Whites (n=4158) who from 1994 to 1995 attended high schools that enrolled Black and White students.

Results. White female students had higher predicted probabilities of smoking or drinking than did Black female students; the largest differences were in schools with high levels of within-school segregation. Black male students had higher predicted probabilities of high educational aspirations than did White male students in schools with low levels of within-school segregation; this association was attenuated for Black males attending schools with moderate or high levels of within-school segregation.

Conclusions. Our results provide evidence that within-school segregation may influence both students' aspirations and their behaviors. (*Am J Public Health.* 2010;100:1687–1695. doi:10.2105/AJPH.2009.179424)

The role of segregation in maintaining and perpetuating racial health disparities is receiving increased attention in public health research.[1–7] The vast majority of these studies, however, have focused on residential segregation, with few investigating the impact of school segregation on health or health behaviors. Yet schools wield considerable influence on individuals' social and economic trajectories. Because the distribution of school resources often falls along racial and class lines, schools are 1 of the prime institutions that engage in the reproduction and perpetuation of social[8] and racial[9] inequities in the United States. For example, Black students today are more likely to attend predominately minority schools than they were in the 1990s[10–12]; in 1991 to 1992, 66% of Black students attended a school where 50% to 100% of the student body was non-White; 77% attended such schools in 2003 to 2004.[12] Predominately minority schools are less able than majority-White schools to provide the full array of educational opportunities.[11,13–15]

Black students who attend racially mixed and predominately White schools are more likely than Whites to be assigned to less academically rigorous coursework, even when Black students' abilities are equivalent to those of the White students.[15–18] This process is often referred to as tracking. Academic tracks correspond to the sequences of courses within subject domains (e.g., English, math, science) that differ in content, rigor, and instruction.[18] In theory, the process of tracking should be based on student ability, previous academic achievement, and course availability. In reality, however, other factors often influence track assignment, including pressure placed on school decision makers by parents, as well as students' race/ethnicity, socioeconomic status (SES), and gender.[18] Academic tracking by race has been termed second-generation segregation and often occurs in racially mixed and predominately White schools in an attempt to recreate middle-class White privilege under the guise of meritocracy and ability.[19–21] Many have argued that racial segregation within schools (hereafter "within-school segregation") affects the educational opportunities of racial minorities at least as much as does racial segregation between schools.[16,17,22,23]

Recent studies suggest that inequalities across and within the education system affect the health and health behaviors of individuals in the short term and long term.[24–28] In the short term, the racial composition of schools appears to influence adolescents' smoking and drinking behaviors. For example, Kandel et al. found that as the percentage of minority students at a school increased, the odds of smoking initiation among all students decreased.[24] Johnson and Hoffmann found lower rates of smoking initiation among Black students, but not White students, attending predominately minority schools.[28] Hoffmann also found lower odds of drinking in predominately minority schools, but only for female students.[27]

Schools may also have long-term effects on health. Walsemann et al. found that the accumulation of educational advantages (e.g., college preparatory coursework, expectations to attend college, attending high-SES schools) decreased the odds of reporting a health limitation in early adulthood and slowed the rate of increase in the odds of health limitations up to middle age, independent of educational attainment.[26] In another study, respondents who reported being in the general academic track, who had taken remedial coursework, or who did not expect to attend college experienced consistently higher levels of depressive symptoms in early and mid-adulthood, independent of family background and adult SES.[25] These studies help elucidate the role that the education system plays in population health, but we know of no

studies that have examined how within-school segregation affects adolescent health.

Within-school segregation may influence the health and health behaviors of adolescents through multiple pathways. Segregating students into different levels of course curriculum on the basis of race is discriminatory. Previous research has suggested that perceived discrimination increases the odds of smoking and drinking among Black individuals.[29–35] It is therefore possible that attending schools with high levels of within-school segregation may lead Black students to engage in riskier health behaviors as a means of coping with the chronic stress of marginalization.

Another possibility is that schools with high levels of within-school segregation may create an environment in which stereotypes about group differences are magnified[36] and Black students are marginalized by teachers and peers.[37] In response to such an environment, Black students may seek out same-race friendships and safe places where they feel a sense of belonging and identity.[37] This, in turn, may confer a level of protection against some risky behaviors (e.g., smoking, drinking) by insulating Black students from the riskier behaviors of White students.[24,38–40]

Students are often aware of tracking in their school, even if classes are not marked as high or low ability.[41] Because of the interplay between social, cultural, and political processes involved in tracking decisions at the school level, tracking often results in the conflation of ability with race,[9] which in turn may socialize students to accept their positions in their schools' social hierarchy.[17] Even in schools that provide some opportunity for track mobility, students who have a history of being tracked often do not enroll in high-ability courses because they have internalized the labels and status attached to them by their peers, teachers, and administrators.[37] Thus, another pathway through which within-school segregation may affect health is demoralization.[42–44] Repeated failures and grade retentions, for example, increase the likelihood of dropping out.[15] Dropping out of high school decreases access to economic and social resources in adulthood that have been linked to better physical and mental health.[45–47] In addition, students who are tracked into low-ability courses are less likely to attend or complete college because they do not have the prerequisite coursework to apply to college[18] or do not have access to important postsecondary informational networks.[20]

We examined the extent to which within-school segregation, as measured by racial segregation across levels of the English curriculum, was associated with smoking, drinking, and the educational aspirations of Black and White adolescents.

METHODS

We analyzed wave 1 (1994–1995) restricted data from the National Longitudinal Study of Adolescent Health, a nationally representative sample of adolescents in grades 7 through 12 in 1994 to 1995,[48] and the Adolescent Health and Academic Achievement study.[49] We analyzed data from 4 sources: an in-home interview of the student, an in-home interview of the parent, a self-administered questionnaire completed by a school administrator, and retrospectively collected transcript data.[48,49] Transcript data provided information on educational achievement, courses taken, curricular exposure, and school context during the respondents' 9th- through 12th-grade years (if applicable). We limited the use of transcript data to courses taken during the 1994–1995 school year.

The original sample had 80 high schools. Of these, 78 provided transcript data. We excluded 13 schools whose student body was either 100% White or 100% Black, 1 school that had too few students to calculate a meaningful measure of within-school segregation, and 17 schools with no Blacks in attendance. Our total sample comprised 47 schools.

We restricted our analysis to students who self-reported as non-Hispanic Black (n=2731) or non-Hispanic White (n=4158). We excluded 76 students with missing data. The total analytic sample consisted of 6889 adolescents dispersed across the 47 schools (density=27–472 students for the entire sample, 10–243 male students, and 14–229 female students).

Measures

Dependent variables. We created a variable indicating whether the respondent smoked cigarettes on 1 or more occasions in the past 30 days or whether the respondent consumed alcohol on at least 1 day in the past 12 months (excluding drinking alcohol with adult relatives). Those who reported smoking or drinking were coded 1, and all others were coded 0. As a measure of educational aspirations, respondents were asked, "On a scale of 1 to 5, where 1 is low and 5 is high, how much do you want to go to college?" We categorized respondents as having high educational aspirations if they selected 4 or 5, and low–medium if not.

Within-school segregation. We calculated the index of dissimilarity for each school as a measure of within-school segregation. In our study, the measure of dissimilarity captured the unevenness in the distribution of Black and White students across levels of the English curriculum. We used the index of dissimilarity because, as we defined it, the index reflects the process of assigning students to levels of the curriculum according to race, it is a measure of segregation that is widely understood in the field of segregation research, and it is independent of the racial composition of the school.[50] We focused on the English curriculum, rather than math or science, because (1) most students are required to take English throughout high school, whereas math and science requirements vary more across schools (e.g., many schools only require 2 years of science),[51] and (2) students can enroll in advanced English courses without completing prerequisites, which are often required for math and science courses.

We used the following formula to calculate the index of dissimilarity for each school:

$$(1)\quad D = 100^{*}\left[\frac{1}{2}\sum\left|\left(\frac{b_i}{B}\right)-\left(\frac{w_i}{W}\right)\right|\right],$$

where b_i was the number of Black students in the ith English curriculum track at the school (i.e., advanced placement–international baccalaureate–honors, general, remedial, or no English), B was the total number of students at the school, w_i was the number of White students in the ith English curriculum track at the school, and W was the total number of White students at the school. We used the weights provided by the Adolescent Health and Academic Achievement study to calculate the proportion of Black and White students at each level of the English curriculum in 1994 to 1995. The dissimilarity index could range from 0, indicating no segregation, to 100, indicating complete segregation.

Our index ranged from 0.96 to 100, with a mean dissimilarity index of 23. Exploratory

analyses suggested a nonlinear relation between the index of dissimilarity and the dependent variables, so we created 3 dummy variables to represent low (0–9.95), medium (9.96–29.10), and high (>29.10) within-school segregation. Interaction terms between within-school segregation and student race were also created to allow us to investigate whether the relation between within-school segregation and each dependent variable was different for Black and White students.

Individual-level covariates. We included the age of the respondent as a continuous variable. Respondents self-reported their race, which we categorized as non-Hispanic Black or non-Hispanic White. We created a measure of family structure categorized as nuclear (2 biological parents), stepfamily (1 biological and 1 stepparent), female headed, or other. Finally, we constructed a composite measure of family SES, calculated as the mean of standardized (*z* score) measures of family income, parental educational level, and parental occupational prestige, with higher values representing higher levels of SES (Cronbach $\alpha=0.69$).

School-level covariates. We included several school characteristics that might be related to our dependent variables or to our main variable of interest, within-school segregation. School SES was a composite measure calculated as the mean of standardized (*z* score) measures of school-level parental education, school-level parental occupational prestige, and the proportion of students not receiving free or reduced-priced lunch, with higher values representing higher levels of school SES (Cronbach $\alpha=0.85$). Additional covariates were the percentage of non-Hispanic White students in the school (a continuous measure, ranging from 3 to 95), school size (small=1–400 students; medium=401–1000 students; large=1001–4000 students); the region of the country (West, Midwest, Northeast, or South); the school community (urban–suburban=consolidated metropolitan statistical area or metropolitan statistical area with ≥2500 residents; rural=all others); and school type (public or private).

Analyses

Previous research suggests that different factors may influence the behaviors and aspirations of male and female students,[27,52] so we stratified all analyses by gender. We began with

TABLE 1—Sample Characteristics of White and Black Students, by Gender: Wave 1, National Longitudinal Study of Adolescent Health, 1994–1995

	All Students, % (SE) or Mean (SE)	Female Students, % (SE) or Mean (SE)	Male Students, % (SE) or Mean (SE)
Dependent variables			
Smoking or drinking	0.56 (0.006)	0.56 (0.008)	0.57 (0.009)
High educational aspirations	0.83 (0.005)	0.86 (0.006)	0.80 (0.006)
Individual-level characteristics			
Mean age,[a] y	16.7 (0.017)	16.7 (0.023)	16.8 (0.024)
Gender			
Female	0.52 (0.006)	. . .	. . .
Male	0.48 (0.006)	. . .	. . .
Race			
White	0.60 (0.006)	0.59 (0.008)	0.62 (0.008)
Black	0.40 (0.006)	0.41 (0.008)	0.38 (0.008)
Family structure			
Nuclear	0.39 (0.006)	0.39 (0.008)	0.40 (0.008)
Stepfamily	0.10 (0.004)	0.09 (0.005)	0.10 (0.005)
Female headed	0.18 (0.005)	0.18 (0.006)	0.18 (0.007)
Other	0.33 (0.006)	0.34 (0.008)	0.32 (0.008)
Family SES[b]	0.07 (0.009)	0.05 (0.012)	0.09 (0.013)
School-level characteristics			
Within-school segregation[c]			
Low (≤9.95)	0.21 (0.005)	0.22 (0.007)	0.20 (0.007)
Medium (9.96–29.10)	0.50 (0.006)	0.50 (0.008)	0.50 (0.009)
High (>29.10)	0.29 (0.005)	0.29 (0.008)	0.30 (0.008)
School SES[d]	0.06 (0.008)	0.08 (0.011)	0.04 (0.11)
Mean % of White students[a]	57.3 (0.347)	57.0 (0.005)	58.0 (0.005)
School size			
Small (1–400 students)	0.07 (0.003)	0.08 (0.004)	0.07 (0.004)
Medium (401–1000 students)	0.31 (0.006)	0.30 (0.008)	0.31 (0.008)
Large (1001–4000 students)	0.62 (0.006)	0.62 (0.008)	0.62 (0.008)
Region			
West	0.16 (0.004)	0.16 (0.006)	0.15 (0.006)
Midwest	0.22 (0.005)	0.23 (0.007)	0.21 (0.007)
Northeast	0.16 (0.004)	0.16 (0.006)	0.17 (0.006)
South	0.46 (0.006)	0.46 (0.008)	0.47 (0.009)
School community[e]			
Rural	0.12 (0.004)	0.12 (0.005)	0.12 (0.006)
Urban–Suburban	0.88 (0.004)	0.88 (0.005)	0.88 (0.006)
School type			
Private	0.09 (0.003)	0.09 (0.005)	0.09 (0.005)
Public	0.91 (0.003)	0.91 (0.005)	0.91 (0.005)

Note. SES = socioeconomic status. Unless otherwise noted, variables are binary or categorical, and estimates can be interpreted as proportions. Columns may not equal 1 because of rounding. The sample size was n = 6889 respondents and n = 47 schools.

[a]Continuous variable.

[b]Family SES was a composite measure calculated as the mean of standardized (*z* score) measures of family income, parental educational level, and parental occupational prestige, with higher values representing higher levels of family SES.

[c]Within-school segregation was calculated with the dissimilarity index, a measure of the unevenness in the distribution of Black and White students across levels of the English curriculum. The index ranged from 0.96 to 100, with a mean dissimilarity index of 23; the ranges shown correspond to 3 dummy variables.

[d]School SES was a composite measure calculated as the mean of standardized (*z* score) measures of school-level parental education, school-level parental occupational prestige, and the proportion of students not receiving free or reduced-priced lunch, with higher values representing higher levels of school SES.

[e]Urban–suburban included consolidated metropolitan statistical areas or metropolitan statistical areas with 2500 or more residents; rural included all others.

descriptive statistics to understand the data distribution. Next, because of the nonindependent nature of the data (i.e., students tested in schools), we used multilevel modeling techniques to investigate the extent to which within-school segregation was associated with smoking, drinking, and the educational aspirations of Black and White students. Because both of our outcomes were binary variables, we used random-intercept 2-level generalized linear mixed models to answer our research questions.

After examining an unconditional model with no predictors to assess between-school variation in our dependent variables, we ran a model that examined the association between our primary predictor variable—within-school segregation—and our dependent variables, after adjusting for individual-level covariates (model 1). Finally, we added school-level covariates to determine whether the effects of within-school segregation were attenuated once other correlated school characteristics were included (model 2). The equation from our final model for predicting adolescent drinking or smoking was

$$(2)\quad \text{logit}[P(Y_{ij}=\mathbf{X},\mathbf{Z},\mu_{0j})]=\mathbf{X}_i'\beta+\mathbf{Z}_{ij}'\lambda+\mu_{0j},$$

where logit[P(Y_{ij}1 $\mathbf{X}$, $\mathbf{Z}$, μ_{0j})]was the log odds that student i in school j smoked or drank and assumed that conditional on $\mathbf{X}$, $\mathbf{Z}$, and μ_{0j}, Y_{ij} to Y_{nj} were independent; j=1 . . . J_k was the number of schools in our sample; $\mathbf{X}_i'\beta$ was a vector of individual-level covariates (e.g., race, family SES); $\mathbf{Z}_{ij}'\lambda$ was a vector of school-level covariates (e.g., medium segregation) and cross-level interactions (e.g., Black x medium segregation); and μ_{0j} was a random effect representing unobserved heterogeneity for school j and was assumed to be randomly and normally distributed with mean 0. We built similar models to predict the log odds of high educational aspirations.

To make the interpretation of the intercept more meaningful, age was centered at 16 years, the approximate mean age of the sample; the percentage of non-Hispanic White students at a school was mean centered at 57%. Other than the assumption of independence, which was not violated by the study design, no other assumptions needed to be evaluated because the models were nonlinear. We specified random-intercept models with xtlogit in Stata version 10.[53]

RESULTS

Overall, the adolescents were primarily White (60%), tended to live in nuclear families (39%), and had slightly above-average family SES (mean=0.07; SE=0.009; Table 1). The sample had slightly more girls than boys (52% versus 48%) and the mean age was 16.7 years (SE=0.017). Fifty-six percent of the adolescents reported smoking or drinking, and 83% had high educational aspirations.

On average, the majority of adolescents were enrolled in large (62%), urban–suburban (88%), public (91%) schools in the South (46%). On average, schools were primarily White (57.3%) in their student body composition and had slightly above-average SES (mean=0.06; SE=0.008). Half of the students attended schools with medium levels of within-school segregation. More details on the sample characteristics are provided in Table 1.

After adjustments for individual covariates, within-school segregation appeared to be related to female students' predicted log odds of smoking or drinking (Table 2, model 1). Specifically, the results suggested a statistically significant interaction between student race and high levels of within-school segregation. These findings held after adjustment for school-level covariates (Table 2, model 2). As shown in Figure 1, not only did White female students have higher predicted probabilities of current smoking or ever drinking in the past 12 months, but the nature of these racial differences varied by levels of within-school segregation. As the level of within-school segregation increased, racial differences in the predicted probabilities of current smoking or ever drinking in the past 12 months also increased, with the largest Black–White differences found in schools with high levels of within-school segregation (predicted probabilities of 0.54 for White female students versus 0.25 for Black female students). However, we did not observe similar relationships in the educational aspirations model for female students; within-school segregation was not a significant main effect, nor did it interact significantly with race (Table 2, model 2).

We observed opposite patterns for male and female students (Table 3). Within-school segregation did not appear to be related to male students' predicted log odds of smoking or drinking but was related to the predicted log odds of reporting high educational aspirations, after adjustment for individual covariates (Table 3, model 1). Indeed, in predictions of male students' log odds of current smoking or ever drinking in the past 12 months, within-school segregation was not a statistically significant main effect, nor did it interact significantly with race. These findings remained after further adjustments for school-level covariates (Table 3, model 2).

In models predicting male students' log odds of having high educational aspirations, we observed statistically significant interaction effects between student race and within-school segregation, after we controlled for individual covariates. When we included school-level covariates (Table 3, model 2), the interaction effect between race and medium within-school segregation became statistically significant (b=−0.65), and the interaction effect between race and high within-school segregation remained significant (b=−0.73). As shown in Figure 1, racial differences in the predicted probabilities of male students reporting high educational aspirations varied by levels of within-school segregation. In schools with low levels of within-school segregation, the predicted probabilities of reporting high educational aspirations were greater for Black than for White male students (0.94 and 0.83, respectively). However, as the level of within-school segregation increased, racial differences in the predicted probabilities of reporting high educational aspirations dissipated.

DISCUSSION

Consistent with previous research, we found higher rates of smoking or drinking among White students[24,38–40,54] and higher educational aspirations among Black students, regardless of gender.[52,55] Our findings suggest, however, that attending schools with higher levels of within-school segregation may confer some level of protection against risky behaviors for Black female students while simultaneously dampening educational aspirations for Black male students. These findings held even with adjustment for a range of individual- and school-level covariates.

The significant negative association we detected between high within-school segregation and smoking or drinking among Black female students may be attributable to several factors. For example, within-school segregation may affect risk behaviors by fostering same-race friendships. Black female students may befriend other Black students as a buffer against an environment that systematically marginalizes them.[37] Because smoking and drinking are more common among White adolescents,[24,39] the lack of cross-racial friendships may protect Black female students from the riskier behaviors of their White counterparts. Alternatively, the association between within-school segregation and smoking or drinking may reflect engagement in other, unmeasured resiliency strategies among Black female students. Such analyses were beyond the scope of our study; however, our findings suggest the importance of investigating the different types of resistance strategies Black youths adopt in an effort to overcome segregated environments.

Although Black adolescents are less likely than are White adolescents to smoke, the reverse is true in adulthood.[56–58] It is plausible that within-school segregation has short-term protective effects but also has long-term negative effects, especially on smoking. Within-school segregation restricts the educational opportunities of Black students.[18] The long-term consequences of within-school segregation on individuals' social and economic trajectories may not be fully perceived until they attempt to enter college or find gainful employment, at which point they may initiate smoking as a coping mechanism. Indeed, such speculation is consistent with previous studies that found lagged effects of perceived discrimination on health[59–61] and higher rates of smoking and drinking among those who reported current or lifetime discrimination.[29,32] Our study was cross sectional, and we were therefore unable to test this hypothesis, but exploring such questions is an important next step in understanding the long-term effects of within-school segregation.

Students attending desegregated schools are more likely to attend college, be employed, and work in less segregated occupations.[20,62] Our findings, however, suggest a possible exception to this finding: desegregated schools that resegregate within the curriculum by race may dampen

TABLE 2—Log-Odds Estimates From Random Intercept Logit Models Predicting Smoking or Drinking and Educational Aspirations Among Non-Hispanic Black and White Female Students, Regressed on Within-School Segregation: Wave 1, National Longitudinal Study of Adolescent Health, 1994–1995

	Smoking or Drinking[a] (n = 3579)		Educational Aspirations[b] (n = 3579)	
	Model 1, b (SE)	Model 2, b (SE)	Model 1, b (SE)	Model 2, b (SE)
Intercept	0.09 (0.14)	−0.11 (0.15)	2.04*** (0.21)	2.07*** (0.23)
Individual-level variables				
Age,[c] y	0.21*** (0.03)	0.22*** (0.03)	−0.10*** (0.04)	−0.10* (0.04)
Race				
White (Ref)	1.00	1.00	1.00	1.00
Black	−0.68*** (0.16)	−0.69*** (0.16)	0.61* (0.24)	0.65** (0.24)
Family structure				
Nuclear (Ref)	1.00	1.00	1.00	1.00
Stepfamily	0.58*** (0.14)	0.58*** (0.14)	−0.37 (0.19)	−0.34 (0.19)
Female headed	0.42*** (0.10)	0.40*** (0.10)	−0.28 (0.16)	−0.26 (0.16)
Other	0.47*** (0.09)	0.47*** (0.09)	−0.51*** (0.13)	−0.48*** (0.13)
Family SES	0.08 (0.05)	0.06 (0.06)	0.61*** (0.08)	0.56*** (0.08)
School-level variables				
Within-school segregation[d]				
Low (≤ 9.95; Ref)	1.00	1.00	1.00	1.00
Medium (9.96–29.10)	0.12 (0.16)	0.08 (0.15)	0.11 (0.24)	0.14 (0.22)
High (> 29.10)	0.31 (0.17)	0.28 (0.16)	0.11 (0.26)	0.11 (0.23)
School SES		0.02 (0.11)		0.34* (0.17)
White students,[c] %		0.003 (0.002)		0.001 (0.003)
School size				
Small (1–400 students)		0.04 (0.24)		0.32 (0.44)
Medium (401–1000 students)		0.15 (0.11)		−0.33* (0.16)
Large (1001–4000 students; Ref)		1.00		1.00
Region				
West		0.35* (0.15)		−0.35 (0.21)
Midwest		0.37** (0.12)		−0.03 (0.18)
Northeast		0.27* (0.14)		−0.06 (0.21)
South (Ref)		1.00		1.00
School community[e]				
Rural		−0.08 (0.16)		0.07 (0.25)
Urban–suburban (Ref)		1.00		1.00
School type				
Public (Ref)		1.00		1.00
Private		−0.28 (0.27)		0.69 (0.49)
Cross-level interactions				
Black x medium segregation	−0.24 (0.20)	−0.16 (0.19)	−0.30 (0.29)	−0.29 (0.28)
Black x high segregation	−0.72** (0.23)	−0.59** (0.23)	0.07 (0.34)	0.04 (0.34)
ρ	0.02*	0.006*	0.05*	0.02*
Log likelihood	−2291.7	−2282.8	−1348.6	−1334.7

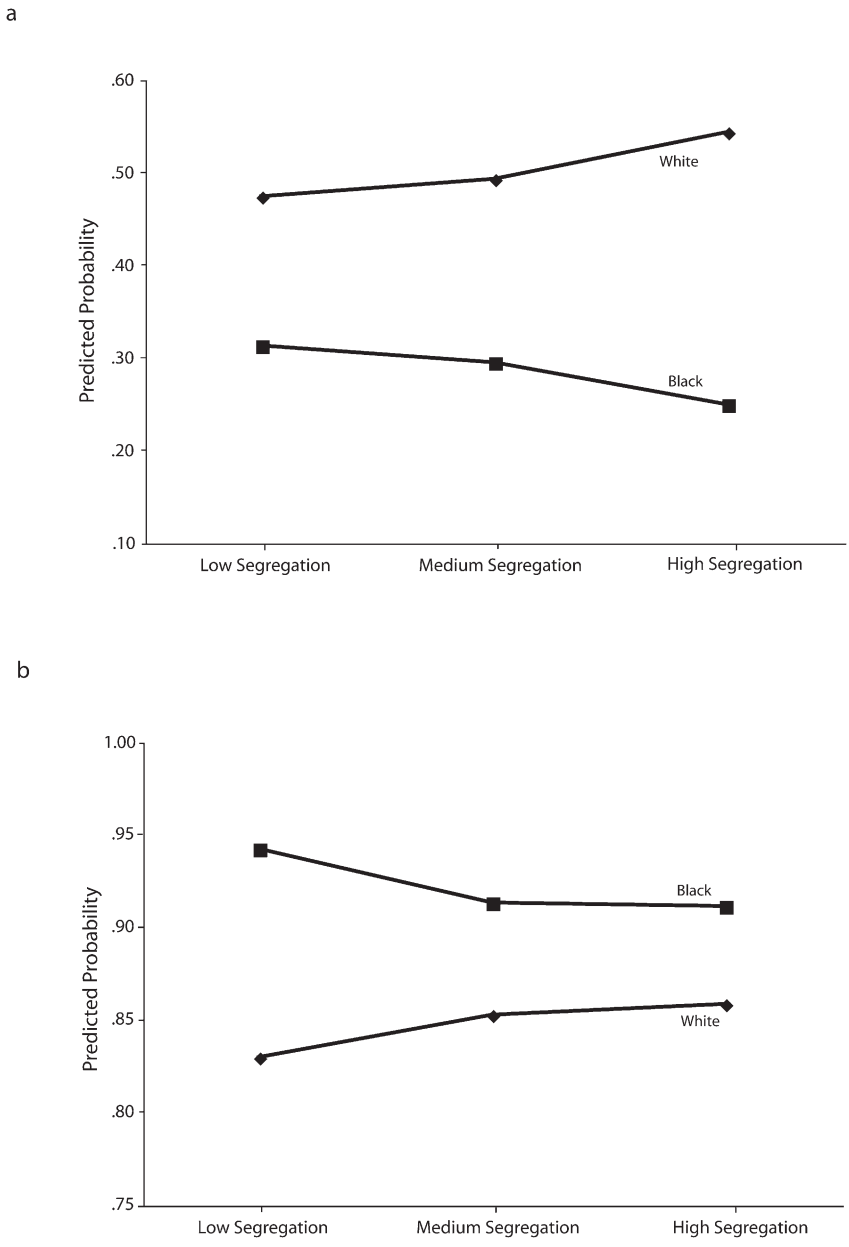
Note. SES = socioeconomic status.
[a]Unconditional model: $\rho = 0.05$; log likelihood = −2406.
[b]Unconditional model: $\rho = 0.11$; log likelihood = −1407.
[c]Age was centered at 16, percentage of White students at 57%.
[d]Within-school segregation calculated with the dissimilarity index, a measure of the unevenness in the distribution of Black and White students across levels of the English curriculum. The index ranged from 0.96 to 100, with a mean dissimilarity index of 23; the ranges shown correspond to 3 dummy variables.
[e]Urban–suburban included consolidated metropolitan statistical areas or metropolitan statistical areas with 2500 or more residents; rural included all others.
*$P < .05$, **$P < .01$, ***$P < .001$.

the educational aspirations of Black male students, which may ultimately lead to lower educational achievement.[41,42,63] This dampening of aspirations could have significant long-term consequences on the social, economic, and health outcomes of Black men. Indeed, low-level curricula often leave students unchallenged, discouraged, and unprepared to attend college[42]; their resultant effects on educational achievement may lead to higher rates of unemployment and poverty, greater engagement in risky health behaviors, and increased likelihood of premature morbidity and mortality.[45–47]

Limitations

Our measure of within-school segregation likely underestimated the extent of segregation within a school because it focused on how unevenly Blacks and Whites were distributed across levels of the English curriculum. Segregation across math, science, and social science courses also occurs and is likely to exist in schools that use academic tracking in the English curriculum,[17] but our ability to calculate the dissimilarity measure was limited because of the greater variability in requirements for these subjects. We were also unable to examine Hispanic–White segregation because not enough schools (n=39) had sufficient numbers of Hispanics and Whites to provide sufficient statistical power for our random-intercept models.

Because our analytic sample comprised only 47 schools, our ability to generalize beyond our sample schools and the students who attended them in 1994 to 1995 is limited. We know of no other data, however, that would allow us to test our novel research questions. In addition, the restricted nature of our sample limited our ability to detect variation across schools in other measures of health and health behaviors. Studies that collect sufficient data on course enrollment and adolescent health across a larger sample of high schools are needed. Finally, we relied on cross-sectional data and were therefore unable to determine causation.



Note. Adjusted for age, family structure, family SES, school SES, percentage non-Hispanic Whites in school, school size, region, rurality, and school type. Age centered at 16 years, and percentage non-Hispanic Whites centered at 57%. Predicted probability calculated using fully adjusted model 2.

FIGURE 1—Predicted probability, by level of within-school segregation and race, of (a) smoking or drinking among female adolescents and (b) high desire to attend college among male adolescents: Wave 1, National Longitudinal Study of Adolescent Health, 1994–1995.

Conclusions

Our findings provide preliminary evidence that within-school segregation may influence not only students' worldview (i.e., aspirations) but also their behaviors (i.e., smoking or drinking). Caution is warranted, however, because our results indicate that the effects of within-school segregation on health behaviors may not be entirely negative, at least in the short term. Efforts to promote a positive racial climate and reduce the risky behaviors of Whites are vital to ensuring that desegregated schools provide the best social and health environment for all of their students. ■

About the Authors

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Contributors

K.M. Walsemann conceptualized the study and led the data analysis and writing. B.A. Bell assisted with data management, analysis, interpretation, and writing.

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TABLE 3—Log-Odds Estimates From Random-Intercept Logit Models Predicting Smoking or Drinking and Educational Aspirations Among Non-Hispanic Black and White Male Students, Regressed on Within-School Segregation: Wave 1, National Longitudinal Study of Adolescent Health, 1994–1995

	Smoking or Drinking[a] (n = 3310)		Educational Aspirations[b] (n = 3310)	
	Model 1, b (SE)	Model 2, b (SE)	Model 1, b (SE)	Model 2, b (SE)
Intercept	0.20 (0.14)	0.06 (0.14)	1.43*** (0.20)	1.60*** (0.20)
Individual-level variables				
Age,[c] y	0.32*** (0.03)	0.32*** (0.03)	−0.18*** (0.04)	−0.18*** (0.04)
Race				
White (Ref)	1.00	1.00	1.00	1.00
Black	−1.16*** (0.18)	−1.18*** (0.17)	1.18*** (0.24)	1.25*** (0.24)
Family structure				
Nuclear (Ref)	1.00	1.00	1.00	1.00
Stepfamily	0.35** (0.13)	0.35** (0.13)	−0.39* (0.16)	−0.41** (0.16)
Female headed	0.42*** (0.11)	0.43*** (0.11)	−0.09 (0.14)	−0.11 (0.14)
Other	0.51*** (0.09)	0.51*** (0.09)	−0.26* (0.12)	−0.26* (0.11)
Family SES	0.05 (0.06)	0.02 (0.06)	0.76*** (0.07)	0.70*** (0.07)
School-level variables				
Within-school segregation[d]				
Low (≤ 9.95) (Ref)	1.00	1.00	1.00	1.00
Medium (9.96–29.10)	−0.05 (0.16)	−0.09 (0.14)	0.10 (0.23)	0.16 (0.19)
High (> 29.10)	−0.03 (0.17)	−0.10 (0.15)	0.15 (0.24)	0.23 (0.20)
School SES		−0.03 (0.10)		0.51*** (0.15)
White students,[c] %		0.003 (0.002)		−0.000 (0.002)
School size				
Small (1–400 students)		−0.23 (0.22)		−0.10 (0.33)
Medium (401–1000 students)		0.15 (0.10)		−0.32* (0.13)
Large (1001–4000 students; Ref)		1.00		1.00
Region				
West		0.08 (0.13)		−0.28 (0.18)
Midwest		0.14 (0.11)		−0.12 (0.15)
Northeast		0.13 (0.12)		−0.21 (0.17)
South (Ref)		1.00		1.00
School community[e]				
Rural		0.01 (0.14)		−0.30 (0.19)
Urban–suburban (Ref)		1.00		1.00
School type				
Public (Ref)		1.00		1.00
Private		0.50 (0.26)		0.20 (0.40)
Cross-level interactions				
Black x medium segregation	0.18 (0.21)	0.28 (0.20)	−0.55 (0.29)	−0.65* (0.28)
Black x high segregation	0.12 (0.24)	0.28 (0.23)	−0.70* (0.32)	−0.73* (0.32)
ρ	0.01*	0.00	0.05*	0.01*
Log likelihood	−2102.1	−2091.4	−1517.4	−1501.5

Note. b = the estimate for the coefficient produced from the analysis; SES = socioeconomic status.
[a]Unconditional model: $\rho = 0.04$; log likelihood = −2238.
[b]Unconditional model: $\rho = 0.11$; log likelihood = −1614.
[c]Age was centered at 16, percentage of White students at 57%.
[d]Within-school segregation was calculated with the dissimilarity index, a measure of the unevenness in the distribution of Black and White students across levels of the English curriculum. The index ranged from 0.96 to 100, with a mean dissimilarity index of 23; the ranges shown correspond to 3 dummy variables.
[e]Urban–suburban included consolidated metropolitan statistical areas or metropolitan statistical areas with 2500 or more residents; rural included all others.
*$P < .05$; **$P < .01$; ***$P < .001$.

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