Racial and Ethnic Gaps in Postsecondary Aspirations and Enrollment

BARBARA SCHNEIDER AND GUAN SAW

One major finding of the Equality of Educational Opportunity (EEO) *report was that a smaller proportion of African Americans than whites reported "wanting to go no further than high school in each region of the country." Blacks in the 1960s had high college aspirations, and those aspirations have continued, but today, as then, fewer blacks than whites attend four-year colleges. Since the EEO report, the U.S. population has become increasingly diverse, and postsecondary aspirations and enrollment now vary considerably among racial and ethnic groups. Whereas the EEO report focused on the significant role of students' concrete knowledge about college in postsecondary attendance, it paid limited attention to variation in postsecondary preparation activities. This study contrasts earlier indicators of student college knowledge with college preparation activities to understand variations in college enrollment among different racial and ethnic groups. Results indicate that concrete knowledge has less impact on minority postsecondary enrollment than taking more-advanced academic courses.*

Keywords: educational aspirations, college enrollment, high school college preparation activities, *Equality of Educational Opportunity* report

Measuring educational aspirations in the 1960s was commonly viewed as the single most important factor in determining how adolescents made sense of their future plans and whether such plans were realistic or not. The sociologist James S. Coleman, one of the leading scholars of the time, along with other researchers viewed aspirations as having lifelong significance, influencing both career choices and future earnings (Alexander, Bozick, and Entwisle 2008; Andrew and Hauser 2011; Coleman et al. 1966; Morgan 2005). Aspirations were also perceived as an early predictor of social mobility for students whose parents had less than a college degree and worked in low-skilled jobs. As the amount of required schooling has increased for many occupations, researchers have had to adapt their understanding and the predictive value of that once highly valued question: how far beyond high school graduation did a student expect to continue his or her education? Today aspirations in and of themselves are especially less predictive of future outcomes in relation to college enrollment for

Barbara Schneider is John A. Hannah Distinguished Professor at Michigan State University. **Guan Saw** is assistant professor at the University of Texas at San Antonio.

This work is supported by the U.S. National Science Foundation (NSF), through Grant DRL-1316702, and the U.S. National Institutes of Health (NIH), through Grant 1R01GM102637-01 (Principal Investigator: Barbara Schneider). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the organizations. Direct correspondence to: Barbara Schneider at bschneid@msu.edu, Michigan State University, 516B Erickson Hall, East Lansing, MI 48824; and Guan Saw at guan.saw@utsa.edu, University of Texas at San Antonio, Department of Educational Psychology, 501 W. Cedar E. Chavez Blvd., San Antonio, TX 78207.

multiple reasons, including financial constraints (Dynarski and Scott-Clayton 2013), inadequate academic preparation (Riegle-Crumb and Grodsky 2010), and lack of information regarding the college admission process (Hoxby and Avery 2012).

Although there are clear limits to the predictive value of aspirations, they are still considered an index of one's knowledge of education pathways and occupational choices, which are modified in turn by family, peer groups, and schooling experiences. More recently, models that use measures of aspirations to predict college status take into account a variety of high school factors, including students' achievement and subjective values, their exposure to and familiarity with college information, and their academic preparation while in high school. This focus on the contextualization of aspirations can be traced to Coleman's view, as articulated in *The Adolescent Society* (1961) and the *Equality of Educational Opportunity* report (1966), that adolescents' education plans are the consequence of the socialization process they experience in the family and during high school. This perspective has, in part, driven the analysis for this study.

In contrast to the 1960s, the transition from high school to college for today's students is a very complicated process; there are a wide range of postsecondary institutions to which a student can apply, multiple fields in which to study, and numerous financial aid programs to select from to support his or her ambitions. Furthermore, an increasingly influential societal norm—reinforced by policymakers and often referred to as "college for all"—suggests that everyone needs to receive some type of postsecondary education (Rosenbaum 1997). Most adolescents in high school believe that attending and graduating from college will make them more viable job applicants in an increasingly competitive labor market. A college degree is seen as the signal of employability and considered the minimum qualification needed for later financial as well as social success. Students rarely think about being overqualified or too educated for positions that require little of their knowledge, skills, or prior work experiences (National Center for Education Statistics 2015a). The college diploma could be thought of as the twenty-first-century driver's license that is flashed to travel, obtain money, and participate in civic life (for an analysis of civic participation among young adults, see Nie, Junn, and Stehlik-Barry 1996).

One of the major findings of the EEO report was that, in the 1960s, African Americans did not enroll in college at the same rate as whites. Although educational aspirations have continued to rise since the 1960s, these aspirations have not translated into actual postsecondary enrollment, especially for some racial and ethnic groups. Why is this so, especially since many high schools have significantly altered their programs and now offer more opportunities for students to learn about and be prepared for college? To answer this question, we compare EEO findings with results from analyses using the most recent national longitudinal data set, the High School Longitudinal Study of 2009 (HSLS:09), taking into account individual characteristics as well as concrete knowledge about college and academic preparation, which we suspect may influence postsecondary enrollment. Unlike the EEO report, which focused on black-white comparisons, our analysis examines the differences in college aspirations, preparation, and enrollment among the more diverse populations that now attend U.S. high schools.

COMPARING EEO FINDINGS WITH RECENT NATIONAL LONGITUDINAL STUDIES

It has now been fifty years since the EEO report, and reviews of its major findings suggest that many of the same problems that beset secondary school students then have continued. Despite high educational aspirations, black enrollment in postsecondary school continues to be proportionately lower than it is for whites. In 2012, only 36.4 percent of the black population between the ages of eighteen and twenty-four were enrolled in degree-granting postsecondary institutions, whereas for whites and Asians the numbers are 42.1 percent and 59.8 percent, respectively (NCES 2015b). Blacks are not the only minority group that proportionately fails to enroll in college. Hispanics and multiracial groups also enroll in postsecondary institutions in numbers lower than their

proportion in the population would indicate —37.5 percent and 39.4 percent, respectively (NCES 2015b). To understand why this enrollment pattern has continued, we compare some of the student and school factors that were studied in the EEO report with similar items found in the most recent HSLS:09. Additionally, we include several factors that research has demonstrated to influence college preparation, such as taking advanced courses, to determine the relative importance of these factors in explaining variation in racial and ethnic postsecondary enrollment.

For example, a number of items in the EEO report tend to be overlooked but have recently been suspected of influencing college attendance. These lesser-known items comprise a set of subjective constructs that includes academic commitment, self-concept, effort, and resistance. Similar items can also be found in HSLS:09, and they are included in our multivariate models predicting postsecondary destinations. With respect to postsecondary knowledge, we also have comparable information regarding reading college materials, meeting with guidance counselors, and preparing for college entrance exams. One major difference between the two data sets is a measure of advanced-course taking, which in the EEO report is limited to students' high school program (college, general, or vocational), whereas in HSLS:09 we have access to the restricted transcript file that identifies the actual courses students took in high school. Although HSLS:09 is clearly not identical to the EEO sample, many of the items in both surveys provide enough of an overlap to justify making comparisons.

Several unique characteristics of the HSLS:09 data set make it different from other national longitudinal data sets and from the EEO sampling frame. First, HSLS:09 began early in the students' high school careers (the fall of ninth grade) and obtained a series of baseline information (for example, key covariates such as sex, race and ethnicity, and family background) that we use in our analytic models. In previous longitudinal studies—such as the Education Longitudinal Study of 2002 (ELS:2002) —each follow-up wave of respondent populations had its cohorts freshened so that the retained sample for each wave could be generalized to the population as a whole.[1] That is not the case with the HSLS:09, in which no sample freshening has occurred. Our analytic estimates are therefore only generalizable to the ninth-grade student populations in 2009 in the United States.

Second, the first follow-up of HSLS:09 was conducted in the spring of students' eleventh-grade year. The EEO sample was collected when the students were in twelfth grade. One of the reasons for the change in the HSLS:09 sampling period from prior national longitudinal studies was the ability to collect more accurate and earlier information on postsecondary plans and enrollment. Surveying in the eleventh grade makes it possible to obtain a more definite estimate of students' actual aspirations and plans without the confounding effect of the college application plans and outcomes typically occurring in the junior and senior years. Administering a second follow-up over the summer after high school graduation and in the early fall of that same year captures more precise measures of actual destinations immediately after high school graduation.

Third, this updated post–senior year survey from June to November following high school graduation identifies a wide range of categories for enrollment in various types of postsecondary institutions and schooling and training opportunities. Over the past thirty years, distinctions between pathways after high school have typically been reduced to more simplified categories, primarily focusing on two- and four-year college attendance (see, for example, Perna and Titus 2005; Rouse 1994). This new set of post–high school classifications consists of enrollment in: (1) a four-year institution; (2) a two-year institution; (3) a certificate or diploma program; (4) courses in a nonspecific

1. A freshened sample includes new participants added to a longitudinal sample plus the retained participants from the longitudinal sample used to produce cross-sectional estimates of the population of a given student cohort for each subsequent wave of a longitudinal data collection.

Table 1. Educational Aspirations of Eleventh-Grade Students, by Race-Ethnicity, 2012

	All	White	Black	Hispanic	Asian	Multiracial
High school or less	0.109	0.095	0.114	0.147	0.042	0.105
	(0.312)	(0.294)	(0.318)	(0.354)	(0.200)	(0.307)
Certificate/other training	0.063	0.056	0.066	0.076	0.050	0.072
	(0.242)	(0.230)	(0.249)	(0.265)	(0.217)	(0.259)
Associate's degree	0.103	0.103	0.084	0.121	0.057	0.104
	(0.303)	(0.304)	(0.378)	(0.326)	(0.232)	(0.305)
Bachelor's degree	0.274	0.303	0.224	0.232	0.263	0.288
	(0.446)	(0.460)	(0.417)	(0.422)	(0.440)	(0.453)
Graduate school	0.345	0.345	0.408	0.296	0.449	0.328
	(0.475)	(0.475)	(0.491)	(0.457)	(0.498)	(0.470)
Don't know	0.109	0.098	0.104	0.128	0.140	0.104
	(0.311)	(0.298)	(0.305)	(0.334)	(0.347)	(0.305)

Source: HSLS:09.

Notes: The entries are means and standard deviations (in parentheses) of individual-level data for HSLS:09 students who participated in both base-year and first follow-up surveys. Data are weighted to be generalizable to the population of ninth-grade students in 2009 in the United States. The racial status of a small number of students is identified as "other," including non-Hispanic American Indian, Alaska Native, Native Hawaiian, and Pacific Islander. They are included in the "all" category but not shown in the table as a separate group.

program; and (5) "other." Similar to the categories used in EEO, the third option is an increasingly important post–high school destination, particularly for students with limited financial resources. Often offered in two- and four-year colleges, these training programs (for example, early childhood education, computer technology, laboratory technician) can also give students the opportunity to take other college courses offered in person or online. This third option constitutes a category distinct from the first two options in our college outcome measure.

ASPIRATIONS AND COLLEGE ENROLLMENT

Since the 1960s, studies have shown that aspirations change over time and tend to edge downward as they become more realistic (Jacob and Wilder 2011). This would suggest that what Coleman found, at least for black twelfth-graders in 1960s, may have been confounded by macro-societal conditions at the time. There is some evidence to suggest this was the case, as Coleman argued that acquiring additional education beyond high school was an important mechanism for blacks to achieve social mobility. During the 1960s, a number of employment opportunities opened up for black graduates following the Civil Rights Act of 1964 (Chay 1998), including the teaching profession (Freeman 1977) and jobs within the federal government (Heckman and Payner 1989). These societal changes may have inspired twelfth-grade black students to aspire to a college degree at considerably higher levels than found in previous studies (Schneider and Stevenson 1999).

In the 1960s, 84 percent of all students expected to obtain some postsecondary education and would have been satisfied with any college degree, not necessarily a four-year or graduate degree (see Coleman et al. 1966, 283, table 3.13.6). Today the situation is quite different. The majority of eleventh-grade high school students within various racial and ethnic groups aspire not only to attend college but eventually to enroll in graduate or professional school (see table 1). Comparing aspirations across racial and ethnic groups, nearly half of Asians expect to attend graduate school (45 percent), followed by blacks (41 percent), whites

Table 2. College Enrollment in the Fall of 2013, by Race-Ethnicity

	All	White	Black	Hispanic	Asian	Multiracial
Not in school	0.306	0.272	0.365	0.365	0.115	0.338
	(0.461)	(0.445)	(0.482)	(0.481)	(0.319)	(0.473)
Certificate/other training	0.090	0.084	0.082	0.107	0.084	0.146
	(0.286)	(0.417)	(0.274)	(0.309)	(0.278)	(0.354)
Associate's degree	0.233	0.224	0.229	0.261	0.231	0.155
	(0.423)	(0.417)	(0.421)	(0.439)	(0.422)	(0.363)
Bachelor's degree	0.293	0.368	0.208	0.160	0.501	0.161
	(0.455)	(0.482)	(0.406)	(0.366)	(0.500)	(0.368)
Don't know	0.078	0.053	0.116	0.108	0.069	0.180
	(0.267)	(0.224)	(0.321)	(0.310)	(0.253)	(0.385)

Source: HSLS:09.

Notes: The entries are means and standard deviations (in parentheses) of individual-level data for HSLS:09 students who participated in base-year, first follow-up, and 2013 update surveys. Data are weighted to be generalizable to the population of ninth-grade students in 2009 in the United States. The racial status of a small number of students is identified as "other," including non-Hispanic American Indian, Alaska Native, Native Hawaiian, and Pacific Islander. They are included in the "all" category but not shown in the table as a separate group.

(35 percent), multiracial groups (33 percent), and Hispanics (30 percent).[2] Just as they did in the 1960s, blacks continue to have higher college aspirations than whites.

One major difference between the 1960s and today is that blacks were previously only more likely than whites to *expect* to attend college but in actuality did not enroll in college at the rate that their aspirations suggested. Coleman, using college admissions data from the Higher Education Branch of the Office of Education, showed that only 2 percent of the total postsecondary enrollment (including two- and four-year colleges and other types of higher education institutions) were black, whereas whites made up 95 percent of that enrollment and other nonwhites totaled 3 percent.

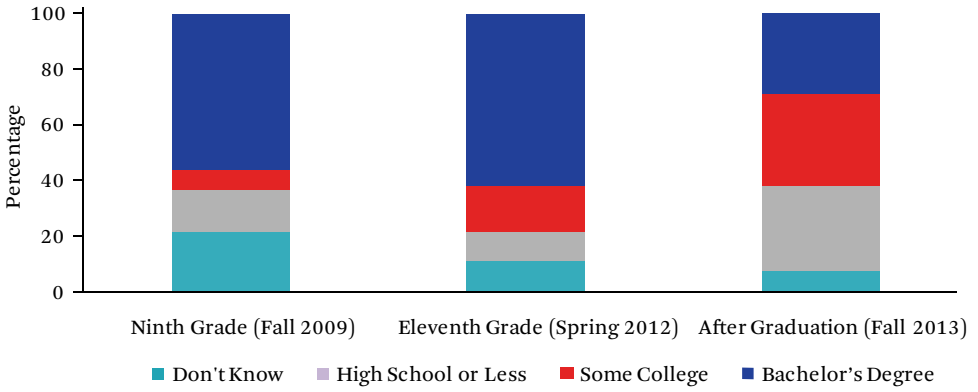
The proportion of blacks who enter college immediately after high school graduation has grown dramatically since Coleman's time and now has caught up to the rates for whites but not those for Asians (NCES 2016).[3] The situation is somewhat different when we examine four-year college enrollment. Four-year college enrollment patterns captured in HSLS:09 indicate that blacks (21 percent), Hispanics (16 percent), and multiracial students (16 percent) in 2013 are much less likely than whites (37 percent) and Asians (50 percent) to attend these types of postsecondary institutions (see table 2). There does not seem to be a racial or ethnic difference in two-year college enrollment, with the exception of Hispanics, who are more likely to enroll in a two-year college.

In contrast to the EEO study, which was a cross-sectional study, HSLS:09 tracks students' educational aspirations and enrollment over time. Figure 1 presents a longitudinal perspective on educational aspirations from high school (ninth and eleventh grades) to college enrollment status in the year after high school graduation for HSLS:09 respondents. Nearly 60 percent of high school students aspired to ob-

2. All comparisons in tables 1 to 5 have been tested for statistical significance, using Bonferroni adjustments, and are significant at the 0.05 level.

3. While these rates seem to suggest that race may not be an important indicator of inequality of educational opportunity, it is important to point out that blacks and Hispanics are more likely to attend two-year institutions, to enroll in remedial courses, and to have higher dropout rates and lower completion rates in these institutions than whites and Asians (Saw 2016a).

Figure 1. Educational Aspirations in Ninth and Eleventh Grades, and College Enrollment in the Year After Graduation.



Source: HSLS:09.

tain at least a bachelor degree when they were in ninth grade and eleventh grade; however, only about 30 percent of them enrolled in a four-year college in the fall immediately after their high school graduation. Today the greatest mismatch between aspirations and actual enrollment occurs in four-year college enrollment (Roderick, Coca, and Nagaoka 2011).

In his analysis of the aspirations and postsecondary enrollment of black students, Coleman argued that the failure of blacks to matriculate could be traced to the fact that they lacked concrete knowledge about college, especially information on college requirements and programmatic offerings. Is this the case today? Recent studies have focused on randomized trials to study the impact of imperfect information and suggested that this may be the reason for lower college enrollment (see, for example, Castleman, Arnold, and Wartman 2012; Hoxby and Turner 2013). In the following analysis, we examine the issue of concrete college knowledge or imperfect college information and distinguish it from college academic preparation. We argue that academic preparation has become a major stratification mechanism, especially for low-income minority students, as nearly all high schools have instituted some types of programs to assist students in acquiring college knowledge and admission information.

COLLEGE KNOWLEDGE

Coleman did not view aspirations as the sole determinant of college attendance; he argued that, when determining behavioral choices, it is imperative to examine both objective and subjective measures (Coleman 1990).[4] Objective measures are those actions that demonstrate an individual's interest in and performance toward a particular outcome, such as grades. Subjective measures are individuals' perceptions about themselves regarding their actions and the actions taken by others, such as feeling good about oneself and feeling in control. Both of these types of measures are evident in the EEO items that were used to frame Coleman's analysis.

Coleman contended that certain "concrete" actions taken by students were critical for actualizing college attendance, including having ever read a college catalog, having ever written to or talked to a college official about going to college, and having definite education plans for the fall following high school graduation. Coleman showed that whites and Asians were more likely to have ever read a college catalog, regardless of their regional location, than blacks and Hispanics (who were the least likely to have read a college catalog). He also found this pattern to hold with respect to having conferred with a college official about attending college: here again, whites and Asians were the

4. This point is made throughout many of Coleman's writings and most clearly articulated in *Foundations of Social Theory* (1990).

most likely to have talked to college officials, and blacks and Hispanics the least likely to have done so. In addition, compared to whites and Asians, blacks and Hispanics were one-third less likely to report having definite plans to attend college in the fall following senior year (see Coleman et al. 1966, 284, table 3.13.7).

One of the major differences today is that students across all racial and ethnic groups have more exposure to college knowledge, including access to information on eligibility requirements for attending a four-year college and to advice regarding postsecondary options. Early in their high school careers, nearly 90 percent of HSLS:09 respondents talked to a parent, friend, teacher, or school counselor about attending college (see table 3). Blacks (93 percent) tend to do this more so than all other groups.

With respect to college eligibility—that is, taking advanced courses, having high grades, taking college admission tests, and receiving college recommendations from teachers or others—a higher proportion of blacks and Asians than whites and others *recognize the importance* of taking high school courses and college entrance exams, even if they do not actually participate in these preparatory activities (see table 3). With respect to actual participation, eleventh-grade black, Asian, and multiracial students are more likely than whites and Hispanics to report having attended a college tour, searched the Internet, talked to a counselor, or taken a course to prepare for college admission. Asians are the most likely to have taken a college entrance exam course and to have sat in a college class, both of which are highly related to four-year college enrollment.

What these types of measures fail to consider are the differences in resources that make such college exposure items translate into actual enrollment. For example, one of the most complex issues is securing financial resources to pay for college. Without proper information about the responsibility for and sufficiency of loans and scholarships, students may easily misunderstand how much college is going to cost. When receiving tuition and room and board information, students are often overwhelmed by the costs and sometimes have difficulty even understanding when their financial commitments are due. Another problem is Internet searches. Recent data released by the Pew Foundation show that low-income and minority students are less likely than whites to have access to computers, both in and out of school (Lenhart 2015). While students can search the Internet through their phones, unless they have access to computers to complete and submit college applications, surfing the Internet can only do so much. It is difficult to apply to a four-year college on a phone.

SUBJECTIVE MEASURES OF SOCIAL BELONGING AND ACADEMIC COMMITMENT

One of the major markers of adolescence is an increasing awareness of one's social and emotional feelings. Most adolescents experience to some extent increased feelings of stress, self-consciousness, and loneliness in high school, coupled with a general decrease in interest in school subject matter (Eccles and Roeser 2010, 2011). This is not, of course, the situation for all students. Both Coleman's analysis and most current surveys contain abbreviated measures of social and emotional learning. Some social psychologists maintain that blacks and other minority students feel a threat to their identity and feel that they do not belong at school (Owens and Lynch 2012; Steele and Aronson 1995). Coleman developed a set of key subjective measures on these points; for example, one item that could be construed as a belonging measure was "whether the student wanted to come to school." Other subjective items that could be viewed as measuring academic commitment included "if something happened and you had to stop school now, how would you feel?" and "[do] you [want] to be a good student?"

Using items that measured self-concept, Coleman found that blacks and Hispanics were more likely to have a higher overall sense of self than whites. Similar patterns are found today. Some consider this to be a racial paradox—that students who may do poorly in school still have a high self-concept—and some have suggested that these results may be directly tied to low teacher expectations (Ulrich, Wilhelm, and Hanna 2014). Teachers may

Table 3. College Eligibility Knowledge of Ninth- and Eleventh-Grade Students, by Race-Ethnicity, 2009 and 2012

	All	White	Black	Hispanic	Asian	Multiracial
Advice seeking (ninth-graders)						
Father/mother	0.815	0.824	0.831	0.785	0.806	0.837
	(0.388)	(0.381)	(0.375)	(0.411)	(0.395)	(0.370)
Teacher/school counselor	0.293	0.273	0.371	0.278	0.288	0.350
	(0.455)	(0.446)	(0.482)	(0.448)	(0.453)	(0.480)
Friends	0.526	0.539	0.497	0.490	0.592	0.578
	(0.499)	(0.498)	(0.500)	(0.500)	(0.492)	(0.494)
Parent/teacher/counselor/friends	0.899	0.896	0.930	0.887	0.902	0.906
	(0.301)	(0.305)	(0.255)	(0.317)	(0.298)	(0.293)
Knowing the importance of eligibility for getting into a typical four-year college (eleventh-graders)						
High school courses	0.640	0.605	0.710	0.669	0.725	0.626
	(0.480)	(0.489)	(0.454)	(0.471)	(0.447)	(0.484)
High school grades	0.870	0.852	0.893	0.894	0.868	0.872
	(0.336)	(0.355)	(0.309)	(0.308)	(0.339)	(0.334)
SAT/ACT	0.849	0.842	0.905	0.831	0.881	0.845
	(0.357)	(0.365)	(0.294)	(0.375)	(0.324)	(0.362)
Recommendations	0.535	0.489	0.602	0.592	0.562	0.556
	(0.499)	(0.500)	(0.490)	(0.492)	(0.496)	(0.497)
Exposure to college education (eleventh-graders)						
Attended a college tour	0.500	0.504	0.526	0.459	0.541	0.545
	(0.500)	(0.500)	(0.499)	(0.498)	(0.498)	(0.498)
Sat in on or took a college class	0.251	0.250	0.251	0.237	0.325	0.258
	(0.434)	(0.433)	(0.434)	(0.425)	(0.468)	(0.438)
Searched the Internet or read guides to research college options	0.796 (0.403)	0.813 (0.390)	0.827 (0.378)	0.724 (0.447)	0.852 (0.355)	0.820 (0.384)
Talked to a counselor hired to prepare for college admission	0.125 (0.331)	0.101 (0.301)	0.185 (0.389)	0.140 (0.347)	0.160 (0.366)	0.121 (0.326)
Took a course to prepare for a college admission exam	0.404 (0.491)	0.410 (0.492)	0.455 (0.499)	0.334 (0.472)	0.547 (0.498)	0.415 (0.491)

Source: HS0LS:09.

Notes: The entries are means and standard deviations (in parentheses) of individual-level data for HSLS:09 students who participated in both base-year and first follow-up surveys. Data are weighted to be generalizable to the population of ninth-grade students in 2009 in the United States. The racial status of a small number of students is identified as "other," including non-Hispanic American Indian, Alaska Native, Native Hawaiian, and Pacific Islander. They are included in the "all" category but not shown in the table as a separate group.

provide messages to these students that they are doing fine and their work is acceptable when in fact that is not the case.

In terms of *academic* self-concept, Coleman used "how bright do you think you are in comparison to other students in your grade?" "feeling whether one can learn or not," and "would do better if the teachers did not go as fast." In general, responses to these questions were the same for blacks and whites; however, Asians and Hispanics had lower levels of academic self-concept (see Coleman et al. 1966, 288, tables 3.13.12 and 3.13.13). With respect to objective behavioral measures of academic engage-

Table 4. Subjective and Behavioral Measures of Eleventh-Grade Students, by Race-Ethnicity, 2012

	All	White	Black	Hispanic	Asian	Multiracial
Academic commitments						
School is often a waste of time	1.718	1.728	1.633	1.719	1.603	1.828
	(0.748)	(0.740)	(0.748)	(0.745)	(0.703)	(0.802)
Students with bad grades often get good jobs after high school	1.974	1.939	2.049	2.006	1.881	2.002
	(0.710)	(0.667)	(0.815)	(0.715)	(0.722)	(0.731)
Studying in high school rarely pays off later with a good job	2.170	2.038	2.411	2.324	2.072	2.187
	(0.939)	(0.876)	(1.036)	(0.953)	(0.956)	(0.941)
People can do okay even if they drop out of high school	2.197	2.156	2.301	2.198	2.146	2.317
	(0.841)	(0.836)	(0.849)	(0.842)	(0.822)	(0.832)
Academic self-efficacy						
Math self-efficacy (composite)	0.000	−0.016	0.150	−0.056	0.127	−0.055
	(0.998)	(1.011)	(0.964)	(0.958)	(0.931)	(1.067)
Science self-efficacy (composite)	0.000	0.022	0.123	−0.144	0.072	0.020
	(0.995)	(1.011)	(0.911)	(0.981)	(0.922)	(1.059)
Academic effort						
Hours spent on studying (per school day)	4.675	4.987	3.802	4.245	6.989	4.436
	(4.655)	(4.725)	(4.095)	(4.555)	(5.786)	(4.366)
Resistance (number of times in last six months)						
Late for school	2.755	2.418	3.067	3.282	2.446	2.935
	(3.205)	(3.007)	(3.172)	(3.527)	(3.150)	(3.257)
Absent from school	3.509	3.584	3.024	3.748	2.200	3.714
	(3.156)	(3.105)	(2.977)	(3.334)	(2.584)	(3.245)
Cut or skipped classes	0.754	0.602	0.708	1.116	0.566	0.806
	(2.090)	(1.842)	(1.931)	(2.572)	(1.821)	(2.232)
In class without homework done	3.262	3.371	2.715	3.280	2.819	3.611
	(3.495)	(3.543)	(3.100)	(3.537)	(3.163)	(3.744)
In class without note-taking supplies	1.292	1.314	1.336	1.205	0.978	1.415
	(2.634)	(2.635)	(2.610)	(2.607)	(2.402)	(2.796)
In class without books or reading material	1.097	1.122	1.060	1.068	0.917	1.151
	(2.264)	(2.280)	(2.199)	(2.268)	(1.954)	(2.362)
Put on in-school suspension	0.335	0.273	0.558	0.352	0.101	0.387
	(1.204)	(1.128)	(1.379)	(1.241)	(0.772)	(1.298)

Source: HSLS:09.

Notes: The entries are means and standard deviations (in parentheses) of individual-level data for HSLS:09 students who participated in base-year, first follow-up, and 2013 update surveys. Data are weighted to be generalizable to the population of ninth-grade students in 2009 in the United States. The racial status of a small number of students is identified as "other," including non-Hispanic American Indian, Alaska Native, Native Hawaiian, and Pacific Islander. They are included in the "all" category but not shown in the table as a separate group.

ment, the EEO items were fairly limited and included such questions as the number of books a student had read and if the student studied outside of school.

Today blacks remain highly motivated in school (see table 4). Asians and blacks are the least likely, compared to other racial and ethnic groups, to perceive school as a waste of time. Yet there is a major inconsistency: blacks are the most likely to feel that individuals with bad grades can get good jobs after high school, that studying hard rarely pays off with a good

job, and that people can do okay without graduating from high school. These responses suggest that while blacks may not view school as a waste of time, their view of working hard academically rarely translates into better career opportunities. This may be related to their views on discriminatory hiring practices as well as misinformation on the benefit of receiving a high school diploma.

Blacks also have a higher sense of self-efficacy in math and science, but they are the least likely to report putting forth considerable effort in the hours they spend studying compared to all other racial and ethnic groups (see table 4). Similar inconsistencies between self-efficacy and effort are also found among multiracial students. Hispanic students generally show a lower level of self-efficacy on all of these items and report the least amount of time spent on studying. Regrettably, these findings are similar to ones in earlier national longitudinal studies (for example, Hafner et al. 1990).

HSLS:09 has multiple measures that could be viewed as indicators of a lack of school commitment and general resistance to positive school behaviors. These school resistance measures include: cutting or skipping classes; being placed on in-school suspension; being late for school; being absent from school; and attending class without completing homework assignments or with no note-taking supplies or reading materials. Hispanics and other multiracial groups appear to exhibit more resistant behaviors, including cutting classes, being in class without homework, and not being prepared for class, whereas blacks, Asians, and whites report fewer incidences of such behaviors. Asians consistently demonstrate the least resistance to school protocols and expectations and a greater tendency to avoid negative school behaviors.

WHAT IS MISSING?

These descriptive statistics suggest that the reasons why minority students fail to enroll in college are not entirely clear. For example, blacks have concrete knowledge of college admissions, have high self-efficacy, engage in relatively low levels of misbehavior, and value the importance of college entrance exams, yet do not proportionally enroll in college compared to whites, who sometimes do not show these same positive patterns. Looking back at ninth grade, blacks, Hispanics, and multiracial students are less likely to plan to take advanced courses in mathematics and to find it useful for college admission (see table 5).[5]

The value of college preparatory coursework has become a major policy lever for increasing college readiness at state and district levels. Many states and large school districts are identifying and requiring more advanced-level coursework, especially in science and mathematics (Jacob et al. 2015). The problem with this policy is that poorly resourced schools—those most likely to serve low-income and minority students—are often less likely to have teachers with the necessary qualifications to teach advanced courses in science, mathematics, and other core academic subjects. Additionally, many students lack the fundamental knowledge base to succeed in courses where the material requires earlier knowledge and skill proficiency (Covay Minor et al. 2015).

Using high school transcript data from HSLS: 09, we find that Asians and whites are more likely to be in highly concentrated academic courses than other racial and ethnic groups (see table 5). Blacks, Hispanics, and multiracial students take lower-level courses in mathematics. In fact, ninth-grade blacks are the most likely to be in math classes below algebra. And similarly, blacks are also less likely to have taken courses above Algebra I (25.6 percent) in comparison to whites (38.8 percent) and Asians (62.6 percent). Hispanics, while not the lowest in math level at ninth grade, fail to complete more than a second year of algebra through high school. At the very highest end, we find that blacks are the least likely to earn Advanced Placement (AP) or International Baccalaureate (IB) credits (earned by 23.7 percent

5. This same avoidance of math in forming college plans can be found in the first follow-up (calculations available from authors by request). These responses are particularly troublesome given that taking advanced mathematics in high school continues to show positive effects on earnings (Rose and Betts 2004) and, more recently, on mortality (Warren et al. 2015).

Table 5. College Preparation of Ninth- and Eleventh-Grade Students, by Race-Ethnicity, 2009 and 2012

	All	White	Black	Hispanic	Asian	Multiracial
College plan (in early ninth grade)						
Number of years of math courses expects to take in high school	0.613 (0.487)	0.687 (0.464)	0.491 (0.500)	0.519 (0.500)	0.731 (0.443)	0.573 (0.495)
Plans to take more math because will help to get into college	0.534 (0.499)	0.571 (0.494)	0.444 (0.497)	0.471 (0.499)	0.706 (0.456)	0.553 (0.497)
Plans to take more math because will be useful in college	0.483 (0.500)	0.511 (0.500)	0.424 (0.494)	0.431 (0.495)	0.621 (0.485)	0.491 (0.500)
Academic preparation (transcript data)						
College preparatory program	0.348 (0.476)	0.383 (0.486)	0.311 (0.463)	0.278 (0.448)	0.575 (0.495)	0.295 (0.456)
Highest-level math course taken by the end of ninth grade						
Below Algebra I (for example, no math, basic math, pre-Algebra)	0.150 (0.357)	0.138 (0.345)	0.201 (0.401)	0.149 (0.356)	0.041 (0.199)	0.166 (0.372)
Algebra I	0.504 (0.500)	0.474 (0.499)	0.543 (0.498)	0.574 (0.495)	0.333 (0.472)	0.518 (0.500)
Above Algebra I (for example, Geometry, Algebra II)	0.347 (0.476)	0.388 (0.487)	0.256 (0.437)	0.276 (0.447)	0.626 (0.484)	0.316 (0.465)
Highest-level math course taken by high school graduation						
Below Algebra II (for example, Algebra I, Geometry)	0.193 (0.395)	0.162 (0.369)	0.218 (0.413)	0.266 (0.442)	0.062 (0.241)	0.202 (0.402)
Algebra II	0.228 (0.420)	0.218 (0.413)	0.236 (0.425)	0.238 (0.426)	0.117 (0.322)	0.279 (0.449)
Above Algebra II (for example, calculus, AP/IB math)	0.579 (0.494)	0.620 (0.485)	0.546 (0.498)	0.496 (0.500)	0.821 (0.383)	0.519 (0.500)
Ever earned credits in AP/IB	0.364 (0.481)	0.395 (0.489)	0.237 (0.425)	0.329 (0.470)	0.712 (0.453)	0.339 (0.474)
Credits earned in AP/IB combined	1.170 (2.065)	1.250 (2.246)	0.634 (1.635)	1.015 (2.070)	3.315 (3.521)	1.091 (2.164)
Ever earned credits in college subjects	0.117 (0.321)	0.144 (0.351)	0.058 (0.234)	0.093 (0.291)	0.135 (0.342)	0.098 (0.297)
Credits earned in college subjects	0.224 (0.860)	0.280 (0.917)	0.103 (0.564)	0.166 (0.703)	0.223 (0.714)	0.246 (1.267)

Source: HSLS:09.

Notes: AP = Advanced Placement; IB = International Baccalaureate. The entries are means and standard deviations (in parentheses) of individual-level data for HSLS:09 students who participated in base-year, first follow-up, and 2013 update surveys. Data are weighted to be generalizable to the population of ninth-grade students in 2009 in the United States. The racial status of a small number of students is identified as "other," including non-Hispanic American Indian, Alaska Native, Native Hawaiian, and Pacific Islander. They are included in the "all" category but not shown in the table as a separate group.

of black students on average, whereas the average for all students is 36.4 percent).

It would seem that, even though minority students are receiving college information, that information alone is not enough to help them make a successful postsecondary transition. We argue that course preparation and information are key to college enrollment but have differential effects on the type of postsecondary institution a student attends. We argue that how college information is acted upon with respect to course-taking and other behaviors provides significant insights into how educational inequalities continue to manifest themselves at the postsecondary level. In the next set of analyses, we disentangle concrete college knowledge from academic preparation to understand how the allocation of resources may be undermining equality of educational opportunities for minority groups.

MODELING COLLEGE ENROLLMENT

The following multivariate analysis uses data from the ninth grade, eleventh grade, and 2013 update to predict college enrollment. Our analytic sample contains the 15,237 students who participated in all three waves. The outcome measure is both anticipatory and actual enrollment as of November 2013 in a four-year bachelor's program, in a two-year program, or in a certificate or other training program; not engaged in postsecondary education; and a category for those who reported that they didn't know what their status would be as of November 2013. Since the 2013 update survey was conducted from June to November 2013, we have included in our model a covariate for the timing of the students' responses. We include this category recognizing that some of those who responded with "don't know" might have been considering multiple options for their future plans. In the next follow-up survey, we will be able to unpack and determine a status designation for those in the "don't know" category. These students tended to be poor and minority, from non-intact families, and limited in their college knowledge, which may explain why they responded "don't know" (see table 6).

Another important category is enrollment in certificate and training programs; these students tend to have higher aspirations than those who are not attending any type of schooling after high school. For example, 25.6 percent of students in certificate or training programs reported that they wanted to attend graduate school when they were in eleventh grade, whereas only 16.6 percent of their non-college-going peers had that aspiration. These individuals had better academic preparation than those who stopped their education after high school. However, they had limited college knowledge (see table 6).

In our first analysis, we conduct a multinomial logistic regression with the omitted category "those students who do not expect by November 2013 to be in any school program (n = 3,877)."[6] The models contain demographic information, aspirations at eleventh grade, and subjective and behavioral measures. The two major dimensions we focus on are college knowledge (by which we mean exposure to college education) and college academic preparation. For those covariates with missing values (ranging from 0.1 percent to 4.6 percent), we created indicators to identify missingness patterns. Regression models are weighted using panel weights.

Examining raw differences among racial

6. We also conducted an ordered logistic regression that took into account the ordered categories of postsecondary education programs, from the lowest-ranked category ("not in school") to "certificate or other training" and "associate's degree," to the highest-ranked category ("bachelor's degree program"), excluding the category of "don't know." The results (reported in appendix table A1) basically do not change our main conclusions from the multinomial logistic regression reported in table 7. We chose to use results from multinomial logistic regression for two major reasons. One assumption of ordered logistic regression is that the relationship between predictors and ordered (ranked) outcomes is linear. That is not the case in our data as shown in multinomial logistic regression. For example, being Hispanic (as compared to being white) or aspiring to get an associate's degree (as compared with aspiring to obtain no more than a high school diploma) are not linearly correlated with the ordinal category of college enrollment. Second, multinomial logistic regression estimates allow for a more nuanced understanding of the association between individual or contextual factors and a particular postsecondary education group.

Table 6. Descriptive Statistics for HSLS:09 Respondents, by College Enrollment

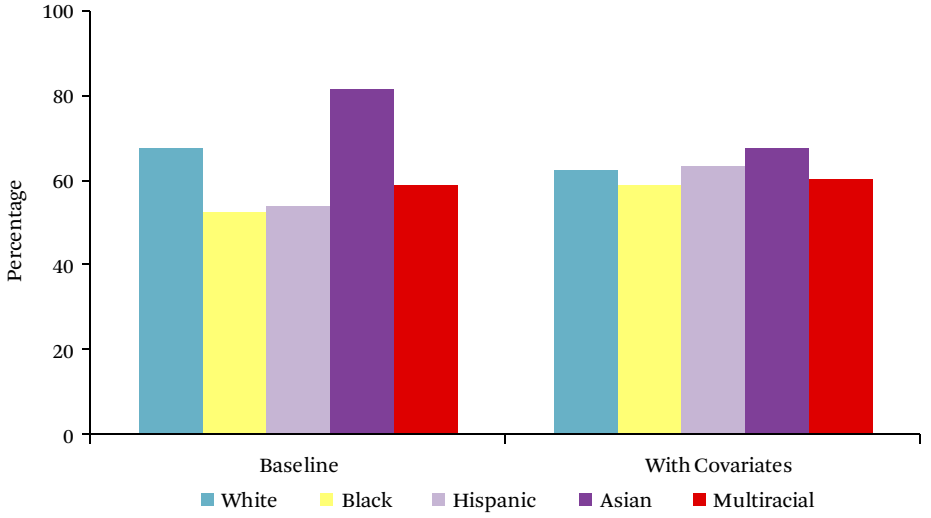
	Non-College (n = 3,877)		Don't Know (n = 1,001)		Certificate or Other Training (n = 1,269)		Associate's Degree (n = 3,420)		Bachelor's Degree (n = 5,670)	
Variables	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Demographics										
White	0.466	0.499	0.352	0.478	0.484	0.499	0.494	0.500	0.643	0.479
Black	0.164	0.370	0.204	0.403	0.125	0.331	0.136	0.343	0.098	0.297
Hispanic	0.253	0.435	0.312	0.464	0.254	0.435	0.249	0.432	0.124	0.329
Asian	0.014	0.117	0.031	0.173	0.035	0.183	0.035	0.184	0.060	0.237
Multiracial	0.089	0.285	0.074	0.261	0.087	0.282	0.078	0.269	0.069	0.254
Other race	0.014	0.118	0.027	0.162	0.016	0.124	0.008	0.089	0.007	0.081
Female	0.410	0.492	0.547	0.498	0.513	0.500	0.540	0.498	0.531	0.499
Socioeconomic status (composite)	−0.416	0.595	−0.336	0.680	−0.173	0.695	−0.101	0.670	0.134	0.340
Intact family	0.422	0.494	0.534	0.499	0.573	0.495	0.574	0.495	0.708	0.454
Non-intact two parents/guardians	0.242	0.429	0.169	0.375	0.171	0.377	0.180	0.385	0.125	0.330
Single parent	0.311	0.463	0.276	0.447	0.236	0.425	0.230	0.421	0.156	0.363
Other family structure	0.025	0.155	0.021	0.145	0.020	0.142	0.016	0.124	0.111	0.105
Education aspiration (eleventh grade)										
Don't know	0.128	0.334	0.179	0.383	0.108	0.310	0.093	0.291	0.062	0.241
High school or less	0.250	0.432	0.113	0.317	0.109	0.311	0.029	0.168	0.006	0.079
Certificate or other training	0.116	0.321	0.061	0.240	0.083	0.276	0.036	0.186	0.010	0.100
Associate's degree	0.130	0.336	0.120	0.325	0.159	0.365	0.122	0.327	0.030	0.170
Bachelor's degree	0.210	0.408	0.255	0.436	0.286	0.452	0.317	0.465	0.323	0.468
Graduate school	0.166	0.372	0.271	0.445	0.256	0.437	0.403	0.491	0.569	0.495

Subjective/behavioral measures (eleventh grade)										
Academic orientations (composite)	−0.359	0.989	−0.141	0.964	−0.139	1.014	0.057	0.974	0.282	0.926
Math self-efficacy (composite)	−0.154	1.028	−0.039	0.969	−0.060	0.990	0.040	0.973	0.222	0.965
Science self-efficacy (composite)	−0.099	1.014	−0.117	1.013	−0.031	0.924	0.046	0.997	0.179	0.984
Hours spent on homework/studying	3.428	3.826	3.781	4.068	4.073	4.197	4.636	4.410	6.725	5.324
Resistance (composite)	0.301	1.171	−0.031	1.010	0.003	0.928	−0.135	0.815	−0.260	0.786
Exposure to college education										
Attended a college tour	0.386	0.487	0.475	0.500	0.454	0.498	0.508	0.500	0.667	0.471
Sat in on or took a college class	0.156	0.363	0.216	0.412	0.208	0.406	0.292	0.455	0.363	0.481
Searched for or read college guides	0.673	0.469	0.800	0.400	0.799	0.401	0.861	0.346	0.932	0.252
Talked to a college admission counselor	0.116	0.320	0.149	0.356	0.111	0.314	0.131	0.338	0.113	0.317
Took a preparation course for college exam	0.294	0.456	0.358	0.480	0.375	0.484	0.407	0.491	0.549	0.498
Academic preparation										
College preparation program	0.113	0.316	0.283	0.450	0.256	0.436	0.357	0.479	0.626	0.484
Low-math pipeline (below Algebra II)	0.401	0.490	0.196	0.397	0.241	0.428	0.127	0.332	0.018	0.135
Mid-math pipeline (Algebra II)	0.281	0.450	0.280	0.449	0.286	0.452	0.267	0.442	0.111	0.315
High-math pipeline (above Algebra II)	0.318	0.466	0.525	0.500	0.474	0.499	0.607	0.489	0.870	0.336
Math standardized score (eleventh grade)	45.095	8.573	48.602	8.916	48.039	9.291	50.663	8.615	57.595	8.885
Earned credits in AP/IB courses	0.207	0.781	0.685	1.541	0.640	1.525	1.001	1.977	2.583	2.955
Earned credits in college subjects	0.075	0.463	0.112	0.521	0.145	0.556	0.277	0.993	0.394	1.139

Source: HSLS:09.

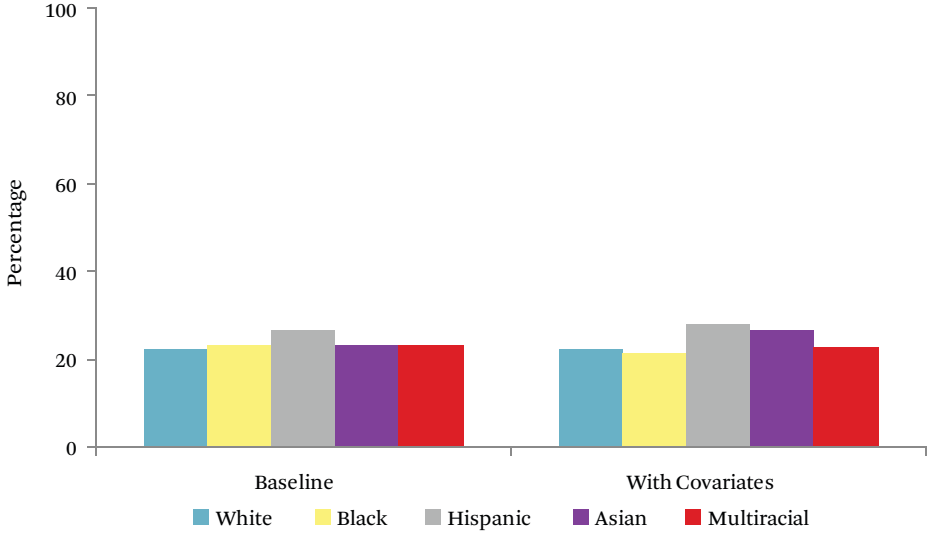
Notes: N = 15,237. AP = Advanced Placement; IB = International Baccalaureate. The entries are means and standard deviations (in parentheses) of individual-level data for HSLS:09 students who participated in base-year, first follow-up, and 2013 update surveys. Data are weighted to be generalizable to the population of ninth-grade students in 2009 in the United States. The racial status of a small number of students is identified as "other," including non-Hispanic American Indian, Alaska Native, Native Hawaiian, and Pacific Islander. They are included in the "all" category but not shown in the table as a separate group.

Figure 2. Predicted Probability of Any Postsecondary Enrollment (Including Certificate or Training Program) for White and Black Ninth- and Eleventh-Grade Students



Source: HSLS:09.
Note: Models with covariates are the full models reported in table 7.

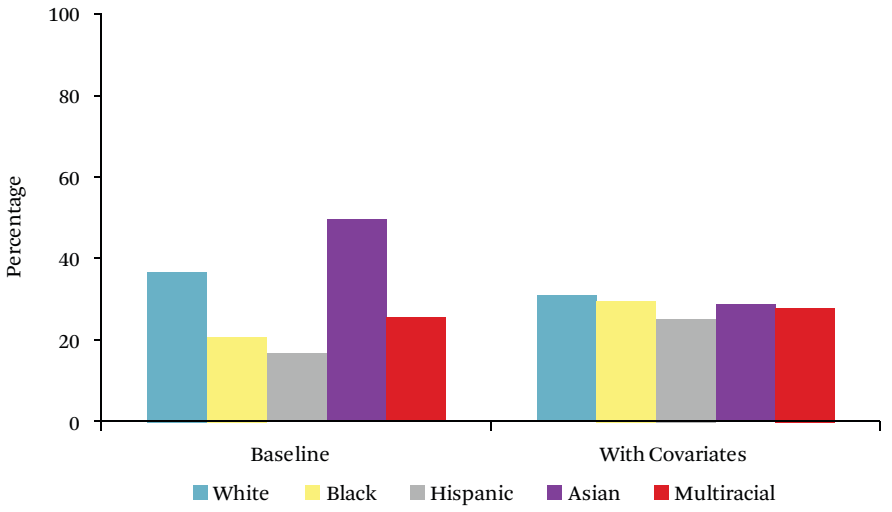
Figure 3. Predicted Probability of Two-Year College Enrollment for White and Black Ninth- and Eleventh-Grade Students



Source: HSLS:09.
Note: Models with covariates are the full models reported in table 7.

groups, blacks and Hispanics are less likely to attend four-year colleges. Approximately 21 percent of blacks would attend a four-year college, whereas for whites that figure is 36 percent (see figures 2 through 4). As shown in figure 4, the baseline difference in four-year college enrollment between blacks and whites is about fifteen percentage points. When adding demographic covariates, the difference is reduced to about 3.6 percentage points, sug-

Figure 4. Predicted Probability of Four-Year College Enrollment for White and Black Ninth- and Eleventh-Grade Students



Source: HSLS:09.
Note: Models with covariates are the full models reported in table 7.

gesting that the black-white gap in four-year college attendance can largely be explained by individual and family characteristics. Similar patterns are observed for the outcome measure of any postsecondary enrollment (including certificate or training programs, two-year programs, and four-year programs).

It is important to recognize these baseline differences because, when we include covariates, essentially we are homogenizing individual and contextual factors that previously have been shown to be distinctive. For example, only 10 percent of black students are in advantaged families (the highest quintile of the socioeconomic status composite score in HSLS: 09), whereas 28 percent of whites are.

Table 7 shows results from our complete analytic model. When we estimate educational aspirations, exposure to college education, subjective and behavioral measures, and college preparation, then blacks are as likely as whites to attend four-year colleges. A similar pattern can be found for Hispanics. Overall, those who enroll in four-year colleges tend to have families with more advantaged resources and to reside in two-parent households.

With respect to aspirations, not unexpectedly those in more advantaged families tend to have higher ambitions. Those who aspired to attend a four-year college when they were in eleventh grade were nearly twice as likely to expect to attend graduate school. Four-year-college-goers are also more likely than students in the other categories to be academically oriented, although they tend to have low feelings of efficacy in math and science and they are less likely to misbehave. As for exposure to college, we find that students in four-year colleges are more likely to have taken college tours, searched college guides, or taken a college entrance preparation course. For example, compared with high school graduates who never went on a college tour, the predicted probability of enrolling in a four-year college for those who did go on a college tour increases from 26.5 percent to 31.7 percent (odds ratio = 1.628, $p < 0.001$). Students in associate's degree programs tend to have taken a college class; we suspect that this may be the consequence of dual enrollment opportunities in all types of high schools and that these classes were not necessarily rigorous in their content (Marken et al. 2013). However, it is students in two- and four-year college programs who are the most academically prepared, who took more academic courses in high school, and who took at least one advanced math course and received college

Table 7. Odds Ratios for Multinomial Logit Models Predicting College Enrollment for HSLS:09 Respondents

	Don't Know (n = 1,001)		Certificate or Other Training (n = 1,269)		Associate's Degree (n = 3,420)		Bachelor's Degree (n = 5,670)	
Demographics								
Black (reference = white)	1.921***	(0.346)	0.967	(0.176)	1.109	(0.137)	1.183	(0.224)
Hispanic (reference = white)	1.849***	(0.329)	1.332†	(0.212)	1.396*	(0.183)	0.867	(0.138)
Asian (reference = white)	1.946*	(0.548)	1.924*	(0.530)	1.607*	(0.322)	1.305	(0.279)
Multiracial (reference = white)	1.148	(0.307)	1.058	(0.185)	0.972	(0.121)	0.848	(0.123)
Other race (reference = white)	3.271*	(1.555)	1.283	(0.514)	0.720	(0.265)	0.703	(0.370)
Female (reference = male)	1.449**	(0.187)	1.304*	(0.139)	1.269**	(0.101)	1.165†	(0.095)
Socioeconomic status	1.131	(0.103)	1.525***	(0.150)	1.524***	(0.102)	2.497***	(0.168)
Non-intact two parents/guardians (reference = intact)	0.641**	(0.095)	0.624***	(0.080)	0.723**	(0.075)	0.650**	(0.098)
Single parent (reference = intact)	0.804	(0.133)	0.776*	(0.095)	0.836†	(0.079)	0.812†	(0.087)
Other family structure (reference = intact)	1.081	(0.403)	0.877	(0.349)	0.815	(0.223)	0.675	(0.176)
Education aspiration (reference = high school or less)								
Don't know	2.255***	(0.554)	1.369	(0.326)	3.760***	(0.690)	5.232***	(1.547)
Certificate or other training	0.855	(0.238)	1.305	(0.334)	1.797**	(0.392)	1.550	(0.557)
Associate's degree	1.425	(0.381)	2.052**	(0.494)	4.935***	(1.008)	3.349***	(1.065)
Bachelor's degree	1.541*	(0.328)	1.784*	(0.405)	5.391***	(0.985)	8.559***	(2.474)
Graduate school	1.758**	(0.366)	1.881**	(0.454)	7.463***	(1.374)	11.708***	(3.463)

Subjective/behavioral measures								
Academic orientations	1.067	(0.064)	1.069	(0.060)	1.176***	(0.052)	1.289***	(0.062)
Math self-efficacy	0.982	(0.059)	0.994	(0.053)	0.958	(0.047)	0.915†	(0.046)
Science self-efficacy	0.864†	(0.071)	0.945	(0.047)	0.915†	(0.044)	0.869**	(0.039)
Hours spent on homework/studying	0.978	(0.016)	0.993	(0.013)	0.991	(0.011)	1.015	(0.012)
Resistance	0.843*	(0.059)	0.877**	(0.042)	0.827***	(0.036)	0.803***	(0.041)
Exposure to college education								
Attended a college tour	1.144	(0.138)	1.074	(0.111)	1.124	(0.091)	1.628***	(0.162)
Sat in on or took a college class	1.070	(0.157)	1.018	(0.124)	1.274*	(0.131)	1.201†	(0.130)
Searched for or read college guides	1.166	(0.199)	1.246	(0.172)	1.291*	(0.151)	1.571***	(0.202)
Talked to a college admission counselor	1.250	(0.254)	0.920	(0.168)	1.180	(0.150)	1.175	(0.170)
Took a preparation course for college exam	1.016	(0.130)	1.136	(0.153)	1.053	(0.097)	1.423***	(0.135)
Academic preparation								
College preparation program	1.619**	(0.274)	1.592***	(0.213)	1.699***	(0.205)	2.267***	(0.281)
Low-math pipeline (reference = Algebra II)	0.629**	(0.111)	0.761†	(0.118)	0.510***	(0.069)	0.248***	(0.054)
High-math pipeline (reference = Algebra II)	1.023	(0.165)	0.908	(0.120)	0.964	(0.100)	1.237	(0.164)
Math standardized score (eleventh grade)	1.024**	(0.009)	1.002	(0.007)	1.021***	(0.006)	1.058***	(0.006)
Log(AP/IB credits)	1.563***	(0.194)	1.553***	(0.197)	1.539***	(0.174)	2.266***	(0.242)
Log(college credits)	0.962	(0.199)	1.296	(0.266)	1.566**	(0.245)	1.494*	(0.244)

Source: HSLS:09.

Notes: N = 15,237. AP = Advanced Placement; IB = International Baccalaureate. "High school or less" is the reference group (n = 3,877). In addition to the predictors, indicators for participants with missing values on each covariate and dummy variables indicating the timing of the students' responses on college enrollment status (by month from June to December 2013) are included in the regressions. Standard errors clustered by school are reported in parentheses.

†$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$ (two-tailed tests)

credit.[7] The predicted probability of attending a four-year college increases from 26.9 percent to 32.5 percent (odds ratio = 2.267, $p < 0.001$) for those students who graduated from a college preparation program in high school (that is, they completed four English credits, three math credits, three science credits, three social studies credits, and two foreign language credits).

In our final analysis, turning back to Coleman's findings comparing the college knowledge of whites and blacks and employing a model of both college exposure and preparation, we find that exposure is beneficial for blacks compared to whites. We also find, however, that the major determinant of college enrollment for blacks is preparation (see table 8). Table 5 shows that blacks are less likely to take more advanced math courses. When blacks have completed a college class in high school, they do not seem to gain the same benefit that whites do from this experience. Blacks are more likely to attend a two-year institution (the predicted probability increases from 23.5 percent to 32.8 percent; odds ratio = 2.535, $p < 0.01$), not a four-year institution.

What might be the problem here? One explanation could be that blacks have less access to financial resources and two-year colleges are less expensive, so they are more likely to attend these less selective institutions even though they have taken advanced classes in high school. However, we suspect that the reason lies with the quality of the courses that the students are taking. Recent analyses of high school transcripts have shown that black students are more likely to enroll in advanced-level courses that in actuality are less rigorous than their course title would suggest (Kim 2015). They also are more likely to fail these courses and take them again the first semester in college (Saw 2016a).

DISCUSSION

This study compares EEO findings on the postsecondary aspirations, preparation, and enrollment of young students in the 1960s with the most recent national cohort of high school students who participated in the HSLS:09. Similar to the EEO report, our results show that today's black students, along with their Asian peers, have higher college aspirations than white, Hispanic, and multiracial students. However, despite major reforms in the past five decades, we continue to find gaps between whites and Asians and blacks and other minority groups (Hispanic and multiracial) regarding four-year college enrollment. While one-third of whites and half of Asians enroll in four-year colleges in the fall following high school graduation, that number is only about one-fifth for blacks, Hispanics, and multiracial students.

To investigate the factors influencing postsecondary enrollment, we build on and extend Coleman's ideas of examining the variation in college knowledge and subjective measures of social belonging and academic commitment among racial and ethnic groups. The multivariate models we conduct analyze HSLS:09 survey and transcript data, including measures of academic preparation, which were omitted in the EEO study. Results from our models show that school interventions designed to increase students' knowledge about postsecondary education, such as meeting a college admission counselor and taking a college class while in high school, have little impact on college enrollment. Instead, we find that academic preparation, such as completing a set of college preparation curricula or earning AP and IB credits, is a powerful predictor for college matriculation. Given the importance of academic preparation in determining postsecondary enrollment, we also find that black, Hispanic, and multiracial students, who are underrepresented in higher education, appear to have completed fewer of these academic preparation activities. These results suggest that it is the stratification of the learning opportunities that students experience in school rather than their personal effort that is the major factor impacting their transition from high school to college.

7. The findings are consistent with another set of important studies by Coleman and his colleagues (Coleman and Hoffer 1987; Coleman, Hoffer, and Kilgore 1982) and later work by other scholars (Bryk, Lee, and Holland 1993; Lee et al. 1998) showing that the advantages of Catholic schooling can primarily be attributed to its constrained academic organization and more rigorous curriculum.

Table 8. Interaction Effects: Odds Ratios for Multinomial Logit Models Predicting College Enrollment for HSLS:09 Respondents

	Don't Know (n = 1,001)		Certificate or Other Training (n = 1,269)		Associate's Degree (n = 3,420)		Bachelor's Degree (n = 5,670)	
Demographics								
Black (reference = white)	0.956	(0.957)	5.608	(6.178)	1.342	(1.342)	0.745	(0.745)
Exposure to college education								
Attended a college tour	1.156	(0.156)	1.151	(0.130)	1.116	(0.091)	1.537***	(0.148)
Attended a college tour–by–black	1.003	(0.303)	0.569	(0.226)	1.043	(0.239)	1.904†	(0.682)
Sat in on or took a college class	0.874	(0.148)	0.922	(0.118)	1.057	(0.110)	1.055	(0.116)
Sat in on or took a college class–by–black	2.155†	(0.856)	1.505	(0.661)	2.535**	(0.741)	1.778†	(0.568)
Searched for or read college guides	1.221	(0.228)	1.203	(0.174)	1.252†	(0.148)	1.410*	(0.196)
Searched for or read college guides–by–black	0.814	(0.290)	0.948	(0.559)	1.098	(0.434)	2.144	(1.004)
Talked to a college admission counselor	1.379	(0.315)	0.982	(0.209)	1.223	(0.172)	1.273	(0.202)
Talked to a college admission counselor–by–black	0.735	(0.316)	0.736	(0.290)	0.798	(0.261)	0.600	(0.247)
Took a preparation course for college exam	0.936	(0.127)	1.117	(0.128)	0.972	(0.083)	1.402***	(0.135)
Took a preparation course for college exam–by–black	1.525	(0.507)	1.136	(0.707)	1.696†	(0.480)	0.906	(0.290)
Academic preparation								
College preparation program	1.715**	(0.316)	1.591***	(0.217)	1.603***	(0.194)	2.108***	(0.274)
College preparation program–by–black	0.699	(0.331)	0.819	(0.346)	1.117	(0.439)	1.476	(0.585)
Low-math pipeline (reference = Algebra II)	0.603**	(0.117)	0.739†	(0.118)	0.500***	(0.069)	0.285***	(0.056)
Low-math pipeline (reference = Algebra II)–by–black	1.284	(0.598)	1.615	(0.783)	1.587	(0.567)	0.565	(0.347)
High-math pipeline (reference = Algebra II)	0.908	(0.168)	0.806	(0.106)	0.833†	(0.089)	1.412**	(0.171)
High-math pipeline (reference = Algebra II)–by–black	1.597	(0.703)	2.119	(0.970)	2.419**	(0.748)	0.334*	(0.183)
Math standardized score (eleventh grade)	1.024**	(0.009)	1.009	(0.007)	1.027***	(0.006)	1.063***	(0.006)
Math standardized score (eleventh grade)–by–black	1.009	(0.023)	0.956*	(0.022)	0.972†	(0.016)	0.999	(0.019)
Log(AP/IB credits)	1.487***	(0.200)	1.532***	(0.194)	1.561***	(0.175)	2.261***	(0.236)
Log(AP/IB credits)–by–black	1.435	(0.550)	1.207	(0.572)	1.001	(0.353)	1.088	(0.368)
Log(college credits)	1.188	(0.244)	1.463†	(0.293)	1.835***	(0.264)	1.670**	(0.264)
Log(college credits)–by–black	0.134*	(0.119)	0.232*	(0.147)	0.296**	(0.132)	0.369*	(0.181)

Source: HSLS:09.

Notes: N = 15,237. AP = Advanced Placement; IB = International Baccalaureate. "High school or less" is the reference group (n = 3,877). All other covariates used in table 7 are included in the model. In addition to the predictors, indicators for participants with missing values on each covariate are included in the regressions. Standard errors clustered by school are reported in parentheses.

†$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$ (two-tailed tests)

Similar to prior studies, our models estimating college enrollment control for a comprehensive set of individual, family, and school factors. Such a multivariate modeling strategy can provide empirical evidence on the relative importance of certain factors in influencing college-going outcomes. However, homogenizing individual and contextual factors that have been shown to be different across racial and ethnic groups runs the risk of overlooking the inequality in college enrollment based on social and racial status. Hence, we highlight the baseline differences in postsecondary attendance, which show that at the group level the gap in college enrollment between advantaged groups (white and Asian) and disadvantaged groups (black, Hispanic, and multiracial) persists.

With or without controls, our findings need to be interpreted with some cautionary limitations. The college outcome measure used in this study is limited to the immediate postsecondary enrollment status following high school graduation. It does not capture the delayed college-going behaviors that tend to be found among students from minority groups and low-income families. Our analyses do not include outcome measures on college persistence and graduation. Racial and ethnic gaps in college completion could be larger than the gaps assessed at initial postsecondary enrollment. Another data limitation is that HSLS: 09 lacks measures of family wealth (such as household assets and debts), which might be an important confounder of our models. Prior studies have shown that family wealth has a strong impact on college enrollment, net of income and other measures of socioeconomic background (Conley 2001; Jez 2014). Dalton Conley's (2001) study shows that, when controlling for parental wealth, black students have a net advantage in the likelihood of college attendance.

Many interventions have been implemented to ease the transition from high school to college, especially for low-income and minority students (Schneider, forthcoming). These interventions tend to be of the college exposure type. And while many states have mandated that students take more advanced courses for high school graduation, somehow the implementation of these policies has not reduced the inequities in college enrollment among blacks and whites, as well as among Hispanics and multiracial groups. Why is this the case? Over the past several years, we have been examining differences in the course-taking patterns of students (Kim 2015), school characteristics that can undermine the implementation of policies (Saw 2016b), and larger macroeconomic conditions that have had significant impacts on schools serving low-income and minority students (Covay Minor et al. 2015).

We have found that in many low-income and minority schools, there are fewer teachers who are able to teach the more advanced courses in subjects such as math and science. To meet state requirements, teachers have to be shifted around, and sometimes the teachers in these courses are only provisionally certified. Moreover, teachers in these schools are more likely to be inexperienced and to leave after one or two years, creating an unstable school environment. Additionally, larger state financial crises have reduced general funds for education, and enrollment patterns in high schools tend to be quite unstable, with considerable movement of students throughout the academic year. Unfortunately, all of these conditions, which have implications for preparing students to transition from high school into college, have been more common for a considerable proportion of low-income blacks and Hispanics, who are more likely to live in racially and ethnically concentrated areas that are ridden with high levels of poverty and have limited social and economic resources.

Coleman had foresight in recognizing the importance of college exposure in explaining postsecondary attainment, but he overlooked the possibility that the curriculum would become so diversified by race and social class, with everyone now in the college track. College exposure is now a mechanism that one can find in nearly every type of high school regardless of race and ethnicity. What Coleman did not foresee was that variation in school quality, especially on issues of college preparation, would continue to remain so stratified among schools serving predominantly low-income black students and those serving mostly middle- and upper-class whites. We continue to have racial and ethnic gaps in college enrollment despite decades of reform primarily be-

cause those reforms have failed to focus on the core objective and subjective learning experiences that are crucial for transitioning to postsecondary education.

APPENDIX

Table A1. Odds Ratios for Ordered Logit Models Predicting College Enrollment for HSLS:09 Respondents

	Baseline Model		Full Model	
Demographics				
Black (reference = white)	0.642***	(0.073)	1.063	(0.121)
Hispanic (reference = white)	0.571***	(0.045)	0.923	(0.089)
Asian (reference = white)	1.999***	(0.245)	1.029	(0.119)
Multiracial (reference = white)	0.702***	(0.062)	0.840*	(0.075)
Other race (reference = white)	0.426***	(0.711)	0.783	(0.238)
Female (reference = male)			1.075	(0.057)
Socioeconomic status			1.736***	(0.076)
Non-intact two parents/guardians (reference = intact)			0.776**	(0.066)
Single parent reference = intact)			0.916	(0.061)
Other family structure (reference = intact)			0.819	(0.145)
Educational aspiration (reference = high school or less)				
Don't know			2.887***	(0.397)
Certificate or other training			1.441*	(0.257)
Associate's degree			2.593***	(0.390)
Bachelor's degree			4.069***	(0.557)
Graduate school			5.089***	(0.746)
Subjective/behavioral measures				
Academic orientations (composite)			1.150***	(0.038)
Math self-efficacy (composite)			0.955	(0.030)
Science self-efficacy (composite)			0.920**	(0.026)
Hours spent on homework/studying			1.012	(0.008)
Resistance (composite)			0.847***	(0.026)
Exposure to college education				
Attended a college tour			1.346***	(0.086)
Sat in on or took a college class			1.124†	(0.078)
Searched for or read college guides			1.245*	(0.109)
Talked to a college admission counselor			1.081	(0.093)
Took a preparation course for college exam			1.238***	(0.077)
Academic preparation				
College preparation program			1.617***	(0.126)
Low-math pipeline (reference = Algebra II)			0.528***	(0.062)
High-math pipeline (reference = Algebra II)			1.157†	(0.091)
Math standardized score (eleventh grade)			1.036***	(0.004)
Log(AP/IB credits)			1.653***	(0.096)
Log(college credits)			1.185*	(0.102)

Source: HSLS:09.

Notes: N = 14,236. AP = Advanced Placement; IB = International Baccalaureate. "High school or less" is the reference group (n = 3,877). In addition to the predictors, indicators for participants with missing values on each covariate are included in the regressions. Standard errors clustered by school are reported in parentheses.

†$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$ (two-tailed tests)

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