

Class Composition: Socioeconomic Characteristics of Coursemates and College Enrollment*

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Objective. We investigate how a student's social climate in school, specifically the percentage of coursemates whose parents are college educated, influences the likelihood of enrolling in a four-year college. *Methods.* Using Add Health and AHA data, we employ hierarchical logistic regression models to analyze how the socioeconomic characteristics of coursemates influence four-year college enrollment. *Results.* We find evidence that taking courses with children of college-educated parents increases the likelihood of four-year college enrollment even after controlling for family background, achievement, and placement. *Conclusion.* We argue that the family background characteristics of coursemates may influence college enrollment because coursemates provide access to educational resources, such as information about college, and encourage students to apply to college by serving as a reference group. The favorable educational attainment of students with college-educated parents is partially due to the greater likelihood that they will take courses with other children of college-educated parents.

Although racial inequalities in education decreased dramatically over the last century, differentials in educational attainment by parents' socioeconomic status have remained roughly stable (Gamoran, 2001). Students with advantageous family backgrounds tend to do better and to go farther in school, in part because their families have greater resources to use on

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computers, tutors, travel, and other experiences that promote educational success (Gamoran, 2001; Lareau, 2000). Despite the strong propensity for the intergenerational transmission of educational advantage, there is some evidence of intergenerational mobility in educational attainment. For instance, among the graduating class of 1988, 26 percent of those without a college-educated parent enrolled in a four-year university two years later (Berkner, Chavez, and Carroll, 1997). This mobility may, in part, arise because schools play an important independent role in student academic success and school quality is only weakly correlated with the socioeconomic characteristics of the students they serve (Cook et al., 2002).

The goal of this article is to add to the literature by investigating the ways that educational institutions maintain or disrupt the reproduction of social inequality. We investigate how students' social climates within schools, specifically exposure to coursemates with college-educated parents, influence the likelihood of four-year college enrollment. A large body of research has measured and investigated the influence of segregation between schools, showing that students typically attend schools with other students of the same race (Bankston, 2004; Bankston and Caldas, 1998; Clotfelter, 2004; Portes and Hao, 2004; Reardon, Yun, and Eitle, 2000). Our contribution is to examine the influence of segregation by *parent's education* in course taking *within* schools. This analysis is possible due to the newly available data from the Adolescent Health and Academic Achievement (AHAA) study, the educational component of the National Longitudinal Survey of Adolescent Health (Chantala, Kalsbeek, and Andraca, 2004). These data contain in-depth information on a school-based national sample of students in Grades 7–12 in the 1994–1995 academic year. Recently, the high school transcripts of these students were collected and merged with the survey data. An important aspect of the data is that the sample is highly clustered within schools, allowing us to examine the diversity of students' experiences within school. We use this aspect of our data to our advantage to build a case that an important way that schools shape student outcomes is by structuring the opportunities for student interaction and that, although not uniformly so, student course-taking patterns tend to be segregated by parents' education.

Background

Prior research has demonstrated that the characteristics of other students in one's school are associated with academic achievement. This stream of research starts with the *Coleman Report*, which found that the socioeconomic status of schoolmates influences academic achievement, net of one's own background (Coleman et al., 1966). Recent studies show that the socioeconomic composition of schools is associated with academic achievement, aspirations, and attainment, although the associations are not always strong (Gamoran, 1987; (Phillips and Chin, 2004; Raudenbush and Bryk, 1986).

Based on these findings, some researchers have suggested that one way that schools affect educational outcomes is by structuring the social climate in a way that promotes (or sometimes undermines) learning. For instance, the mean socioeconomic status of parents might influence the academic achievement of all students in a school by shaping school norms, knowledge, values, and habits. In addition, parents with higher levels of education have a greater understanding of the cultural complexities of the educational system and, therefore, are more likely to demand extra services from teachers compared to less-educated parents (Gamoran, 2001; Lareau, 2000) and advocate for their children to be placed in higher-level classes (Baker and Stevenson, 1986; Useem, 1992). Consequently, schools with many students with middle-class experiences and values may provide more opportunities to develop habits as well as styles of self-presentation that facilitate college admission.

Another way that the socioeconomic status of parents in a school might influence learning is by altering the availability of college preparatory courses in a school, as well as the expectation that students will take these courses (Gamoran, 1987). A third way might be by shaping patterns of interaction among parents. Intergenerational closure, or the tendency for parents to know the parents of their child's friends, may promote student learning either by reinforcing norms or by providing greater access to an extended network of adults (Morgan and Sorenson, 1999). Previous studies have shown that highly educated parents experience higher levels of intergenerational closure (Coleman, 1988). Consequently, parents of children in schools with schoolmates who have more highly educated parents may have access to a social network where they can exchange information on their children's educational opportunities. The insights garnered in these social networks may help parents to better manage their children's educational careers (Gamoran, 2001; Lareau, 2000).

If gaining access to information about educational opportunities is why the education of peers' parents matters, then the benefits of being exposed to coursemates with college-educated parents will be particularly strong among students whose parents did not attend college. These students may gain access to information about application procedures and the availability of loans and scholarships that they could have not obtained by interacting with their own family members (Bankston and Caldas, 1998; Coleman et al., 1966).

A limitation of past research investigating the influence of the sociodemographic characteristics of the school population is that an analysis of school composition ignores the diversity of experiences within schools (Gamoran, 1987). That is, students attending the same high school will not necessarily take classes with every other student in his or her grade. Instead, students enrolled in the same school will often take multiple courses with a subset of students. Thus, two students enrolled in the same school may have completely different academic experiences, including the courses they took and the coursemates to whom they were exposed.

Past studies have attempted to examine how the diverse experiences within schools may impact educational outcomes, using a variety of approaches. One approach has been to measure the characteristics of friends (Hallinan and Williams, 1990; Moody, 2001). These studies show that having friends with college-educated parents is a strong predictor of college aspirations and college enrollment (Hallinan and Williams, 1990; Moody, 2001). Another strategy for operationalizing the source of diverse experiences among students within schools, one that is connected to coursework, is to define students' within school contexts by their academic tracks (Gamoran, 1987; Oakes, 1985). This has the advantage of connecting within-school diversity to formal aspects of the school, which can be more easily shaped by policy than can friendship formation. A disadvantage of using tracks, however, is that students cannot be neatly placed in discrete tracks. That is, students in the highest English course may not also be in the highest math course (Lucas and Berends, 2002). Further, some courses, such as band or baseball, do not have a track designation, but exposure to students in these elective courses may have as strong of an impact on a student as exposure to students in academic courses.

Our approach to measuring the within-school diversity of student experiences is to take advantage of the Add Health design with large within-school samples and to estimate the characteristics of the other students with whom the respondent shares courses. More specifically, our course-level exposure variable estimates the percentage of coursemates with college-educated parents where coursemates are defined as students who share the same courses in the same school during the 1995–1996 academic year. The measure, described in more detail in the methods section, also takes into account the number of courses the respondent shares with other sampled respondents in the school. That is, when the respondent takes multiple courses with another student, the respondent is considered to be exposed more to that student than a student with whom the respondent shares only one course.

Taking into account within-school diversity provides a more refined measure of the characteristics of peers the respondent likely interacts with on a daily basis. A course-based measure also helps us build a stronger, although still not airtight, case for causality for the influence of *coursemate* characteristics on student outcomes. Any observed association between school characteristics and student outcomes may be an artifact of unmeasured extraneous variables. Some obvious candidates include school's material resources, the quality of the curriculum, teacher expectations, and parental involvement. For instance, parents who are highly committed to their children's academic success may choose to live in neighborhoods with "good schools," which tend to have adult residents with higher levels of education. If this is this case, contact with peers would not necessarily be an explanation for the finding.

Examining diversity within schools can give us leverage on some potentially confounding variables, particularly community-level characteristics, as our analyses control for the proportion of students in the *school* with

college-educated parents and, consequently, for the school-level resources correlated with community characteristics and parents' education. Nonetheless, there are still additional factors that might confound the true relationship between *coursemate* characteristics and student outcomes, threatening any conclusions about how the mean level of parent's education in a context causes gains in educational attainment. For example, involved parents actively lobby for their children's placement in higher tracks, and these courses have higher-level academic material and more students with college-educated parents. In an attempt to isolate the influence of coursemates, we control for the students' academic placement and performance in their freshman year as well as their own parents' education. Our analyses also include controls for race, family structure, gender, income, college expectations, and a variety of school characteristics. Even so, we are unable to completely rule out all potentially confounding variables. Yet, by examining characteristics of students' coursemates (rather than schoolmates) and by introducing strong controls for academic performance and placement in academic courses prior to the measurement of exposure to coursemates with a college-educated parent, this analysis will provide a strong test of the hypothesis that exposure to other students with college-educated parents influences educational attainment. In so doing, we will have greater insight into the ways schools influence (or possibly sometimes interrupt) the intergenerational transmission of educational advantage.

Our analysis has three parts. In the first part, we describe segregation of students by parent's education within schools. In the second part, we examine whether the proportion of an adolescent's coursemates with a college-educated parent is associated with four-year college enrollment and, if so, whether this, combined with the tendency of schools to segregate students by socioeconomic status, "explains" the intergenerational transmission of educational advantage. That is, does the measured effect of parent's education on college enrollment disappear, or at least decline, once we control for the characteristics of a student's coursemates? The third part of the analysis attempts to narrow the potential reasons why the educational attainment of coursemates' parents influences college enrollment by controlling for family background characteristics as well as measures of academic achievement. We also investigate whether the positive effects of having a high proportion of coursemates with a college-educated parent are especially strong for those without a college-educated parent themselves.

Data and Method

We use data from the National Longitudinal Study of Adolescent Health (Chantala et al., 2004) and transcript data from the Adolescent Health and Academic Achievement (AHAA) study. Our analyses make use of the 1994–1995 in-school interview, the 1995 Wave I in-home interview, and

the 2001–2002 Wave III in-home interview. Wave I includes data on 20,745 students listed on the school roster as in 7th–12th grade in the 1994–1995 academic year. High school transcripts were also collected as part of the Wave III interview. We use these data to capture the characteristics of coursemates, course placement, and GPA.

The complex longitudinal nature of the Add Health offers many advantages for good measurement of the concepts we want to examine and to identify potential causal relationships. Having a great deal of clustering within schools decreases the error in the measurement of the characteristics of students' coursemates (described below). In addition, we have measures of many potential spurious factors taken *prior to* the measurement of the main variable of interest, the proportion of coursemates who have a college-educated parent. Nonetheless, the complex sample design has some weaknesses. As with all longitudinal data sets, sample attrition is an issue. About 76 percent of the eligible respondents completed a Wave III interview, and in 94 percent of these cases, transcript data were collected. An analysis of bias in the sample, however, suggests that once weighted, the Wave III sample accurately represents the population of students in the 1994–1995 academic year (Chantala et al., 2004).

The analyses examine the cohort of 10th and 11th graders during the 1994–1995 academic year. We focus on these grades because this is the stage when students are actively making decisions about college applications. In addition, as explained in more detail below, we measure the characteristics of the respondent's coursemates in 1995–1996. This allows us to observe the influence of coursemates net of key variables measured the year prior, such as college expectations, but it also means that it would be inappropriate to include those in their senior year in 1994–1995 in our sample.

To be included in the sample, participants had to have responded to the in-home surveys during Wave I and Wave III, and granted researchers permission to collect their high school transcripts. These restrictions leave us with a sample of 4,644 students in the 10th and 11th grades in the 1994–1995 academic year. We also exclude students for whom we do not have sufficient information about course taking or where students shared courses with fewer than 20 other students in the transcript study, in efforts to create a reliable measure of course context. The application of these restrictions yields a sample of 3,707 students.

Variables

Dependent Variables. The dependent variable in this analysis is four-year college enrollment. Four-year college enrollment is coded 1 if the participant is currently enrolled or was enrolled in a four-year college and is coded 0 for all other forms of postsecondary education, including none. We choose enrollment in a four-year college over enrollment in any college based on

past research that argues that the primary marker dividing the middle class and the working class is four-year college enrollment (McLanahan and Sandefur, 1994). We choose college enrollment over college graduation as our measure for educational attainment due to the relatively young age of our cohort during Wave III.

Independent Variables. Our independent variable is the percentage of coursemates with college-educated parents. It is an individual-level variable¹ intended to capture the respondent's exposure to other students with college-educated parents. We refer to this variable as COURSE CONTEXT as a shorthand. To construct the denominator of this variable, we first sum the total number of other students who are enrolled in a course of the same title as the respondent and attend the same school during the 1995–1996 academic year. We then sum across all courses to get the total number of students with whom the respondent shares a course. Note that in many cases, a specific pair of students will share more than one course, and our measure will add to the count for each course they share. The numerator is calculated in the same way, but includes only students with a college-educated parent. Table 1 shows the mean on this variable (40.0) prior to standardization. In the multivariate analyses, we use a standardized variable so the coefficients indicate the influence of one standard deviation shift (26.2) in the proportion of coursemates who have a college-educated parent.

Control Variables. Our analyses employ six types of control variables: demographic background, school characteristics, early academic performance, academic performance, college expectations, and characteristics of friends. All variables with the exception of those that capture academic performance and academic placement were measured in Wave I.

Our first set of control variables captures demographic background characteristics. In an effort to accurately determine the relationship between COURSE CONTEXT and educational attainment, we control for parent education, race, family type, and household income. Parent education is a measure of the educational attainment of a respondent's most highly educated parent. Four dummy variables are constructed to represent each mutually exclusive category: less than high school, high school graduate, postsecondary education, and college graduate. We then control for race in light of previous studies that extensively document racial disparities in academic achievement and educational attainment (Roscigno, 1998). Race is based on self-report and is comprised of six dummy variables: white, black, Asian, Mexican, non-Mexican Hispanic, and other race. We control for family type

¹We treat course context as an individual-level variable because the course-taking patterns of students no longer fall neatly into a track (Lucas, 1999).

TABLE 1
**Weighted Distribution on Enrollment in a Four-Year College
 and the Independent Variables**

<i>Individual-Level Variables (N = 3,707)</i>	Percent	
Parent education		
Less than high school		10
High school		27
Some college		21
College degree plus		39
Missing parent education		3
Race		
White		61
Black		16
Asian		4
Mexican		6
Hispanic not Mexican		11
Other		2
Family type		
Two parent		56
Single		20
Step		20
Other		4
Missing income		21
Gender		
Male		49
Female		51
Nativity		
U.S. born		92
Immigrant		8
Early math placement		
Low math		27
Middle math		53
High math		19
	Mean	SD
Household income	50.3	46.0
Wave I college expectations	4.3	1.0
Wave I AH PVT	68.2	9.5
9th-grade GPA	2.7	0.8
11th-grade GPA	2.7	0.8
% Coursemates' parent w/degree	40.2	26.2
<i>School-Level Variables (N = 77)</i>	Percent	
School size (large)		
Small		40
Medium		18
Large		25
Largest		17

TABLE 1—Continued

<i>School-Level Variables</i> (N = 77)	Percent	
Type of school		
Public		79
Catholic		3
Private		18
Metropolitan status		
Urban		23
Suburban		45
Rural		32
Region		
Northeast		17
West		15
Midwest		31
South		38
	Mean	SD
% Schoolmates' parent w/degree	37.3	20.9

in light of past research that has shown that being from a stepparent family or single-parent family is associated with poorer educational attainment outcomes (McLanahan and Sandefur, 1994). Family type is comprised of four dummy variables: two parent, step, single, and other families. We also control for household income (Table 1). When asked to estimate their household income, about a quarter of the interviewed parents either did not answer or refused to answer. We then standardized this variable.²

The second set of control variables captures school characteristics: percentage of students in the school who have college-educated parents, type of school, size of school, regional location, and metropolitan location. The most important school-level control is the percentage of students in the school who have college-educated parents. By including the percentage of schoolmates with college-educated parents in our analyses, we hope to control for school- and community-level characteristics that could influence both course context and college enrollment. This variable was calculated by dividing the number of students with college-educated parents by the total number of students in a school. This is then standardized to have a mean of 0 and a standard deviation of 1. We then control for type of school, comprised of three categories: Catholic, Public, and Private. Private and Catholic schools may offer greater resources, such as better-qualified teachers, greater

²In our analytical sample, the missing values are present in 21 percent of the cases. For these, we set the value to the mean income and code a missing flag to one. This missing flag is included in all analyses to determine whether missing data may be biasing our results. For our analyses, we use a standardized version of this variable so that the coefficient represents the impact of a one standard deviation change in income.

quantities of advanced courses, and educational resources, which cannot be offered by public schools. This, in turn, can better equip students to enter into a four-year college (Gamoran, 2001). We also control for school size because it may determine the number of courses offered, as well as the opportunity for segregation within schools. It could also be the case that students in bigger schools have greater opportunities to participate in extracurricular activities, which may enhance a respondent's chances of college enrollment. Schools are classified into four categories: small, medium, large, and largest. Each category covers about a quarter of schools in the sample. We also control for region (West, Northeast, South, and Midwest) and metropolitan area of residence (urban, suburban, and rural).

The third set of variables measures academic placement and performance in early high school. Add Health Picture Vocabulary Test (AH-PVT) scores,³ GPA in ninth grade, math placement in ninth grade, and college expectations are these control variables. We include these controls because we are interested in how *high school* processes contribute to college enrollment and wish to control for academic experiences prior to high school. GPA is an indicator of early educational achievement and ranges from 0.00 to 4.00.⁴ Math placement in ninth grade measures the preparation in math at the time of high school entry. Students are placed in three groups: coded as no math, remedial, or prealgebra = 1; algebra 1 = 2; geometry, algebra 2, advanced math, precalculus, or calculus = 3.

The fourth control variable is GPA in 11th grade. This variable ranges from 0.00 to 4.00. We control for this variable because we wish to see the effect that course context may have on college enrollment independent of the student's performance around the time he or she is actively making a decision to apply to college. We acknowledge the possibility that coursemates may, in part, influence college enrollment by providing students access to information on the prerequisites for college enrollment, such as the minimum performance in some courses necessary for college enrollment. This may influence a student's GPA. Thus, the introduction of this variable may lead us to underestimate the impact of course context on college enrollment.

We also include a measure of college expectations based on the student's own reports of how likely it is that he or she will go to college, with responses ranging from 1 (not very likely) to 5 (very likely). This measure will allow us to identify the influence of course context on college enrollment net of prior college expectations. In the case of AH_PVT, ninth-grade GPA, expectations,

³The AH-PVT is an adaptation of the Peabody Picture Vocabulary Test, which measures a student's verbal skills (Halpern et al., 2000). Because we are interested in the student's relative performance in AH-PVT rather than the effect that raw scores have on college enrollment, we standardize this variable to have a mean of 0 and standard deviation of 1.

⁴GPA may measure a student's absolute performance as well as a student's performance relative to others in his or her school. Furthermore, some colleges and universities may have minimum GPA requirements. Because we wish to capture absolute performance as well as relative performance, we do not standardize our measures for GPA. We standardize all other continuous variables.

and 11th-grade GPA, missing scores were replaced by mean scores while dummy variables were created for missing values for all other variables.

Finally, we also explore a measure describing the educational characteristics of the respondents' friends' parents. As part of the in-school survey, respondents were asked to list up to five male friends and five female friends. When the friends are also Add Health respondents, we can construct a measure describing the educational characteristics of the friends' parents, specifically the percentage of friends whose parents have a college degree. We do this to test the possibility that our measure of course context is really capturing the influence of friends' characteristics, since friends tend to take courses together. Because only students enrolled in schools where the in-school survey was collected were asked to list their friends and some students reported only having friends who were not Add Health respondents, we are unable to ascertain the percentage of friends with college-educated parents for a third of the sample.

Analytic Approach

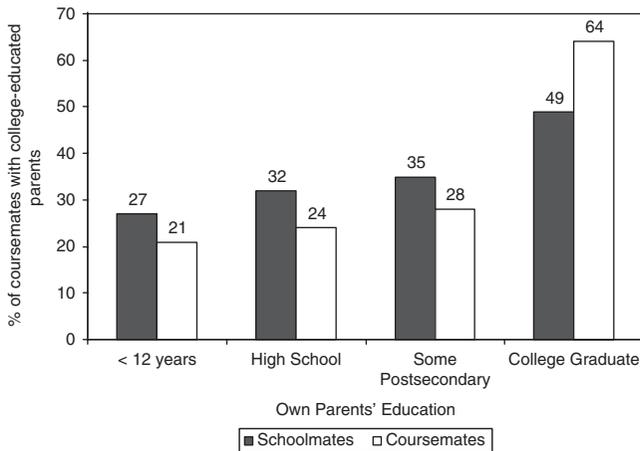
In the descriptive analyses, we first compare the level of segregation within and across schools by comparing the percentage of classmates and schoolmates with college-educated parents among the students with different levels of parent education. Following the descriptive analysis, we estimate the relationship between course context and four-year college enrollment using hierarchical logistic regression models that control for school-level characteristics. This modeling approach accounts for the clustering within schools. We first estimate the baseline association between parent education and college enrollment. We then add the COURSE CONTEXT variable to see whether it alters the baseline association between parent education and college enrollment. After having determined the baseline associations between parent education, course context, and college enrollment, we systematically control for family background, early placement, early achievement, and expectations to determine if course context affects college enrollment net of these variables.

Results

We compare the variation in the proportion of schoolmates and the proportion of classmates who have parents with college degrees by the respondent's own parents' education. Figure 1 shows the percentage of schoolmates who have parents with college degrees for each parent education level (black bars). Not surprisingly, schools are somewhat segregated by level of parents' education. On average, students whose parents have some post-secondary education go to schools where 35 percent of their schoolmates have parents with college degrees, while students whose parents have a

FIGURE 1

Parent-Education of Schoolmates and Coursemates by Own Parents' Education



college degree went to schools where 49 percent of their schoolmates had parents with a degree.

The white bars in Figure 1 represent the proportion of coursemates who have a parent with a college degree, that is, COURSE CONTEXT. The variation by parent education in course context is much greater than variation at the school level. Whereas students whose parents received some postsecondary education were enrolled in courses where 28 percent of the fellow students had parents with a college degree, students with college-educated parents were enrolled in courses where 64 percent of the fellow students had a parent with a college degree.

Next, we examine how parent education at the individual level affects college enrollment and whether this relationship might be mediated by course context. Table 2 presents hierarchical logistic regression coefficients, in the form of odds ratios, displaying the association between parent education, course context, and college enrollment. Model 1 includes only measures of parent education predicting enrollment in a four-year college. Our results are consistent with past findings that show that parent education has a positive association with college enrollment (Gamoran, 2001; Roscigno and Ainsworth-Darnell, 1999). For instance, the odds of college enrollment for students with parents who only graduated from high school is 35 percent the odds of enrollment for students who have a parent with a college degree.

Model 2 of Table 2 adds the percentage of coursemates with a college-educated parent to the model. As hypothesized, course context has positive effects on college enrollment. An increase in one standard deviation in the percentage of coursemates with college-educated parents increases the odds

TABLE 2

Hierarchical Logistic Regression Models Predicting Four-Year College Enrollment by Parent Education, Course Context, and School and Community Characteristics

	Model 1		Model 2		Model 3	
	exp(β)	β /s.e.	exp(β)	β /s.e.	exp(β)	β /s.e.
<i>Parent's Education (BA or Above)</i>						
Less than high school	0.43	-4.78	0.91	-0.47	0.93	-0.36
High school	0.35	-7.87	0.74	-1.88	0.73	-1.91
Some college	0.60	-3.79	1.22	1.25	1.22	1.19
Missing parent education	0.23	-4.18	0.47	-1.94	0.46	-1.92
<i>Course Context</i>						
% of coursemates with college-educated parents*			1.90	7.09	1.93	5.22
<i>School and Community Characteristics</i>						
<i>School context</i>						
% of schoolmates with college-educated parents*					0.92	-0.75
<i>Size of Schools (Large)</i>						
Small					0.86	-0.65
Medium					0.86	-0.77
Largest					1.03	0.17
<i>Type of School (Public)</i>						
Catholic					0.50	-1.88
Private					0.92	-0.13
<i>Metropolitan Area (Urban)</i>						
Suburban					1.25	1.15
Rural					0.98	-0.07
<i>Region (Northeast)</i>						
West					0.55	-3.64
Midwest					0.92	-0.54
South					1.35	1.22
<i>Intercept</i>	2.31	7.34	1.55	3.99	2.93	2.69

NOTE: The variables with * denote variables that were standardized. All coefficients are expressed as odds ratios. The categories in the parenthesis are the reference categories.

of college enrollment by 90 percent. Further, including this variable greatly reduces the association between parent education and college enrollment. This suggests that children with highly educated parents may be more likely to enroll in college, in part because they are more likely to take courses with other children of college-educated parents.

Model 3 of Table 2 adds controls for school characteristics, including the percentage of schoolmates with a college-educated parent, school size, sector, and region. The association between course context and college enrollment changes little with the addition of school characteristics. This suggests that the influence of course context is not spurious due to associated school-level

characteristics. With regard to the control variables, we find that net of parent education and course context, the only school characteristic that contributes to college enrollment is region. Those living in the West were substantially less likely to enroll in a four-year college.

Table 2 shows that with course context controlled, there are no statistically significant differences in college enrollment between students of college-educated parents and other students. Parents' education may, in part, influence student's college enrollment because it provides these students greater exposure to coursemates with college-educated parents or other factors associated with it. This finding is in line with previous research that has identified tracking as one of the most influential mechanisms through which social inequality is reproduced in schools (Oakes, 1985). The difference here is that we examine the influence of overlap in all courses, not just academically "tracked" ones. The next section of the analysis attempts to narrow the list of factors that may contribute to a misspecification of the influence of course context on the probability of college enrollment. Other factors that may contribute to a misspecification of the influence of course context on the probability of college enrollment are the student's demographic and background characteristics, academic ability, and performance in high school.

Model 4 in Table 3 adds demographic and background characteristics to Model 3. This analysis shows that the relationship between course context and college enrollment cannot be explained by demographic and background characteristics. The coefficients for income and income squared suggest that odds of college enrollment improve as income increases until reaching a threshold. The strong positive association between college enrollment and household income is probably due to the differential availability of educational resources and discrepancies in the ability to receive parental support for college tuition. Once households are able to provide a certain level of resources, the odds of college enrollment do not increase as household income increases. Students in stepfamilies are 50 percent less likely to enroll in college compared to students who grew up in a two-parent family. This is probably because stepfathers are less likely to invest in the stepchildren's education and remarried mothers have less control over household resources (Astone and McLanahan, 1991).

Model 5 in Table 3 introduces controls for academic achievement in high school and expectations to attend college. High-achieving students are more likely to be placed in advanced classes. This probably explains their clustering in certain courses as well as their high levels of academic achievement. We control for course placement and academic achievement to isolate the impact that course context may have on college enrollment independent of advantageous placement and higher achievement. We also control for college expectations because they are important determinants of college enrollment (Hao and Bonstead-Bruns, 1998) and possibly course placement. Overall, the positive effect of course-context enrollment substantially

TABLE 3

Hierarchical Logistic Regression Models Predicting Enrollment in a Four-Year College by Parent Education, Within-School Context, Demographic Characteristics, Early Placement, Achievement, College Expectations, and Family Background Characteristics of Friends

	Model 4		Model 5		Model 6		Model 7	
	exp(β)	β /s.e.						
<i>Parent's Education (BA or Above)</i>								
Less than high school	1.06	0.27	1.39	1.42	1.60	1.94	1.57	1.52
High school	0.79	-1.46	0.96	-0.22	1.08	0.32	0.97	-0.14
Some college	1.27	1.38	1.28	1.21	1.40	1.57	1.20	0.84
Missing parent education	0.54	-1.52	0.81	-0.53	0.88	-0.30	1.10	0.25
<i>Course Context</i>								
% of coursemates with college-educated parents*	1.83	4.93	1.41	3.08	1.40	3.00	1.43	2.30
<i>Family Income</i>								
Family income in thousands*	1.50	3.70	1.30	2.69	1.31	2.72	1.31	2.68
Family income in thousands squared	0.52	-2.18	1.00	-0.76	1.00	-0.74	1.00	-0.66
Missing information on family income	0.85	-1.30	0.92	-0.68	0.92	-0.62	0.92	-0.67
<i>Race (White)</i>								
Black	0.91	-0.50	1.39	1.85	1.39	1.84	1.39	1.83
Asian	1.51	1.41	1.13	0.46	1.18	0.63	1.10	0.35
Mexican	0.71	-0.83	0.54	-1.58	0.56	-1.50	0.54	-1.57
Hispanic not Mexican	1.03	0.10	1.61	1.70	1.54	1.58	1.60	1.70
Other race	1.70	1.48	2.10	1.88	2.10	1.86	2.08	1.88
Missing information on race	2.54	0.83	3.97	1.01	3.92	1.00	4.70	1.16
<i>Sex (Male)</i>								
Female	1.37	2.72	1.04	0.31	1.02	0.15	1.04	0.35
<i>Immigrant (U.S. Born)</i>								
Immigrant	1.11	0.32	1.06	0.21	1.09	0.29	1.08	0.25
<i>Family Background (Two-Parent Families)</i>								
Stepparent family	0.50	-5.80	0.55	-4.21	0.54	-4.25	0.55	-4.18
Single-parent family	1.04	0.27	1.34	1.78	1.35	1.79	1.35	1.82
Other family	0.65	-1.42	0.86	-0.59	0.94	-0.25	0.87	-0.52

TABLE 3—continued

	Model 4		Model 5		Model 6		Model 7	
	exp(β)	β /s.e.						
<i>College Expectations</i>								
College expectations			1.46	7.10	1.46	7.09	1.46	6.89
<i>Academic Achievement</i>								
Add Health Picture			1.14	1.87	1.14	1.79	1.14	1.87
Vocabulary Test scores*								
GPA in 9th grade			1.45	3.51	1.43	3.31	1.46	3.48
GPA in 11th grade			2.00	6.24	1.99	6.14	1.99	6.18
<i>Early Placement (Mid-Level Placement)</i>								
Low math placement			0.72	-2.61	0.74	-2.42	0.73	-2.55
High math placement			1.60	3.12	1.59	3.00	1.60	3.07
<i>Educational Characteristics of Friends' Parents</i>								
% of friends with college-educated parents*					1.31	1.39		
Missing information on educational characteristics of friends' parents					0.71	-3.83		
<i>Interaction Between Parent's Education and Course Context</i>								
% of coursemates \times Less than high school							1.13	0.46
% of coursemates \times High school							0.99	-0.06
% of coursemates \times Some college							0.85	-0.71
% of coursemates \times BA or above							1.53	0.81
<i>Intercept</i>	1.95	1.86	0.02	-9.05	1.05	-8.51	0.02	-8.62

NOTE: The variables with * denote variables that were standardized. All coefficients are expressed as odds ratios. The categories in the parenthesis are the reference categories. School and community characteristics (i.e., size, type, region, metropolitan area) were also included in the models.

diminishes once we control for early placement and early achievement. The increase in the odds associated with a one standard deviation change in course context declines from 1.83 to 1.41 but the coefficient for course context continues to be significant. This suggests that the effect of course context is not entirely due to the fact that those with higher GPAs are more likely to attend courses with peers who have a college-educated parent.

In Model 6 of Table 3, we explored the possibility that the effects of course context are spurious of the characteristics of friends. We expect friends' characteristics to be correlated with coursemate characteristics since adolescents typically take courses with their friends or may establish them as they take courses together. We find that the coefficient reduces the impact of coursemate characteristics very little. In addition, the missing flag for the

PERCENTAGE OF FRIENDS WITH COLLEGE-EDUCATED PARENTS variable is significant. Those missing are significantly less likely to attend college. Differences in college enrollment among those who respond to questions about friendship networks and those who fail to do so highlight the benefits of also having coursemate data. Due to the potential bias in our results originating from a differential response rate to questions about friendship networks, we do not include the PERCENTAGE OF FRIENDS WITH COLLEGE-EDUCATED PARENTS variable in the final model.

Finally, Model 7 of Table 3 examines whether students whose parents lack college experience benefit the most from exposure to students with college-educated parents by including an interaction between course context and parent education. With the interaction term included, the main effect of course context is the effect of the percentage of coursemates with college-educated parents for those whose own parents have a college degree. This coefficient is statistically significant and the magnitude of the coefficient is similar to those for course context in Model 5. Although not statistically significant, the direction of the coefficient for the interaction term suggests that the effect of course context may be more positive for students whose parents did not have a high school degree. Nonetheless, we do not include the interaction terms in our final model since the interaction is not statistically significant. Therefore, we estimate the predicted probabilities of college enrollment using Model 5.

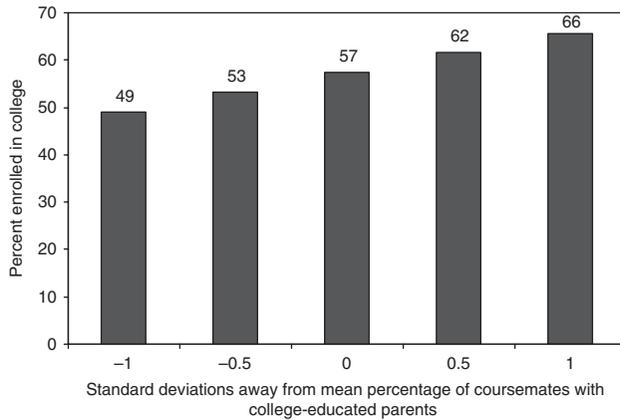
Figure 2 presents the predicted probabilities of college enrollment calculated using coefficients from Model 5 of Table 3 and setting all our independent variables at the sample means described in Table 1. For standardized control variables, this means estimating the effect at the mean, that is, at zero. For categorical variables, such as family type, it means multiplying the coefficient for each family type by the proportion of the sample that is in that family type. The likelihood that a student will enroll in college increases as the percentage of coursemates with college-educated parents increases. When the average student is enrolled in courses where approximately a quarter of the fellow students have college-educated parents (i.e., one deviation below the mean), the likelihood that he or she will enroll in a four-year college is about 50 percent. Conversely, when the average student is enrolled in courses where approximately two-thirds of fellow students have college-educated parents, the likelihood that he or she will enroll in a four-year college is about 66 percent.

Discussion and Conclusion

The results presented above suggest that one way that schools contribute to the intergenerational transmission of educational advantage is via course-taking patterns, which shape students' exposure to peers of similar socioeconomic status. Students with highly educated parents are more likely than

FIGURE 2

Predicted Percentage of College Enrollment by Standard Deviations Away from Mean Percentage of Coursemates with College-Educated Parents



NOTE: Predicted probabilities are calculated at the population mean. The mean percentage of coursemates with college-educated parents is 40 percent and one standard deviation denotes 26 percent.

students with low levels of education to be exposed to peers whose parents also have higher levels of education. Students with higher levels of exposure to students with college-educated parents are more likely to enroll in college.

Without random assignment of students to course contexts, we cannot be certain that peer characteristics are the key causal force behind these observed patterns. However, we make a strong case that peer characteristics “cause” college enrollment by eliminating a number of potential spurious factors that can explain the positive association between course context and college enrollment. Our analyses show that very little of the association between the characteristics of coursemates and college enrollment arises because of associated school-level characteristics. Moreover, although relevant individual-level characteristics partially explain the positive association between course context and college enrollment, they cannot explain all the association. The most important of these was academic performance in high school. Students with higher GPAs are more likely to take courses with the children of college-educated parents than students who perform less well. Simultaneously, they are more likely to enroll in college because of their high GPA. Although not statistically significant, we found that the benefit of having peers with college-educated parents may be especially large among students whose parents have the lowest level of education.

One potential reason why students who take more courses with children of college-educated parents are more likely to go to college is that children of college-educated parents may have higher expectations and aspirations to

enroll in college. These children may instill a stronger desire in the other students to enroll in college. Students enrolled in these courses may also encourage one another to undertake challenging coursework that prepares them for the demands of the college application process. Furthermore, greater intergenerational closure of parents with high levels of education may facilitate the sharing of information about application procedures and opportunities for special programs that can increase a child's chances of winning a scholarship or being accepted to a college of his or her choice.

Whatever the mechanism, these findings imply that schools that segregate less by socioeconomic status will reduce the intergenerational transmission of educational disadvantage. Some segregation almost certainly arises because students with higher socioeconomic status are ready to perform at a higher level earlier in their educational careers. However, additional segregation may arise for reasons having nothing to do with academic preparation. Some highly educated parents lobby for advanced placement even when their children are not performing at higher levels. Students may also self-segregate because they would prefer to take courses with other students similar to themselves regardless of academic ability. This study suggests that both tendencies work to disadvantage students of lower socioeconomic status.

An extension to this study is to examine how in-course exposure affects four-year college graduation since it is the milestone that demarcates the middle class from the working class. Moreover, to better understand the effect that coursemates have on college enrollment, future studies should incorporate measures on information-exchange processes among students and conduct in-depth analyses on the effect that reference cultures have on college enrollment. The contribution of this study is to pinpoint an important factor contributing to the perpetuation of social class inequities—shared course-taking patterns of students. These course-taking patterns are a function of school practices and policies and appear to reinforce social inequality according to social class. That this transmission of disadvantage can be disrupted by coursemates suggests the value of attention to access to educational opportunities *within* schools.

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