

2010 Research Grant Report

Access to Postsecondary Education: The Interrelationships among High School Contexts and Socioeconomic Status

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ABSTRACT

The purpose of the study is to examine the interrelationships between socioeconomic status, and high school contexts, and postsecondary enrollment. Drawing on a nationally representative sample of high school seniors from the Educational Longitudinal Survey (ELS), we seek to broaden our empirical understanding of student- and school-level influences on attending two- and four-year postsecondary institutions. In doing so, we examine the critical roles that human, cultural, and social capital exert on college enrollment, emphasizing how the acquisition and availability of these resources at both the student and school levels are influenced by the high school socioeconomic context. Employing advanced hierarchical modeling techniques, we account for the nested nature of our data and identify the extent to which aspects of the high school context and student predictors of college enrollment may compensate or accentuate disadvantages when analyzed across schools of relatively low, middle, and high SES. Key findings include significant effects of academic preparation, college-linking resources, and enrollment patterns among peers, where the size of these and other effects appear conditional on the high school socioeconomic context.

INTRODUCTION

RESEARCH PROBLEM

Despite significant increases in postsecondary attainment over the past thirty years, wide disparities remain for students in the lowest socioeconomic echelons (Bozick & Lauff, 2007). Researchers examining postsecondary attainment rates for low-income students have generally highlighted individual factors (e.g., status attainment, access to human, social, and cultural capital) as the primary determinants of educational attainment, with comparably less attention paid to the situated contexts in which such behavior occurs. Recent advances in statistical modeling and the availability of large-scale national databases examining educational transitions have led to new evidence that places the high school context at the center of our understanding of postsecondary access. The empirical evidence, however, remains at a relatively incipient stage, inviting researchers to further investigate how the high school context directly influences postsecondary attainment as well as how it moderates the relationship between an individual's socioeconomic status (SES) and their likelihood of attending a postsecondary institution. Additionally, few researchers have examined how individual-level determinants of postsecondary attainment operate within different high school socioeconomic contexts, leaving a substantial gap in our understanding of the predictive power of individually-based strategies within different situated contexts. Thus, the primary purpose of the research project is to investigate the interrelationships between individuals and high schools, with a specific emphasis on improving access for lower socioeconomic students.

IMPORTANCE OF RESEARCH

Our research project is of particular importance given the continued disparities in postsecondary participation among lower socioeconomic students, the long-term consequences of forgoing postsecondary attendance, and the need to incorporate a more holistic approach in studying college access. Today, roughly two out of every three high school graduates enroll in one of approximately 4,000 higher education institutions (Bozick & Lauff, 2007, Gerald & Hussar, 2002). Educational disparities, however, continue to persist across racial and socioeconomic lines, with considerably higher percentages of Black, Hispanic, and low income students forgoing the opportunity to attend a postsecondary institution (Bozick & Lauff, 2007). A recent summary of the second follow-up of the Educational Longitudinal Study (ELS), for instance, found that among first generation students, roughly 47% did not enroll in a postsecondary institution, whereas among families with two advanced degrees, only 13% forgo the opportunity to attend a college or university (Bozick & Lauff, 2007). As a result, high school graduates from lower socioeconomic backgrounds who do not attend college earn approximately three times less than those who go on to earn professional or advanced degrees (Fitzgerald & Delaney, 2002). Thus, research addressing the disparities in educational attainment

among lower socioeconomic students is critical in combating the cycle of economic and social stratification in American society.

Despite a considerable amount of research examining postsecondary enrollment and attainment, most studies are based on status attainment models that focus primarily on individual characteristics of students and their families (Engberg & Wolniak, 2010; Hossler, Schmit, & Vesper, 1999). An emerging body of research, however, suggests that the social, informational, educational, and network resources available at a particular high school may structurally determine students' range of college choices and provide opportunities to compensate for deficiencies in family resources (Hill, 2008; Perna & Titus, 2005). Perna and Titus's study, in particular, uncovered a number of school-level effects that influenced postsecondary enrollment above and beyond the equivalent individual-level measure. There remains a significant gap, however, in our understanding of how the high school context influences both college-going behavior and the efficacy of various policies and interventions geared at enhancing postsecondary attainment for lower socioeconomic students. Our study offers a more holistic approach to studying college access by providing a comprehensive examination of the effects of the high school context and the efficacy of individual-level characteristics and resources within different socioeconomic high school contexts.

TIMELINESS OF RESEARCH

In response to the disproportionate rates of postsecondary attendance and the individual and societal benefits derived from participation, the current administration has called on every American to "commit" to attending at least one year of postsecondary education (Obama, 2009). At the center of this call is the need to better understand the secondary-postsecondary nexus and the structures and organizational norms that are most conducive in enabling students to make the journey from high school to college. The present study contributes new information for understanding postsecondary enrollment by taking into consideration the interdependent relationships among individual socioeconomic backgrounds and their educational contexts for a national cohort of students who are attending a broad array of two- and four-year public and private institutions. In particular, the study contributes empirical evidence on how the SES of a high school moderates the relationship between measures of student- and school-level resources, and two- and four-year college enrollment. Drawing on a nationally representative sample of high school seniors from the Educational Longitudinal Survey (ELS), we examine the ways in which individual and organizational resources facilitate college enrollment across low, middle, and high SES schools. The resulting evidence builds on past research by providing a more contextualized understanding of the interrelationships between individuals and high schools, offering researchers and policymakers a more nuanced perspective to improve college access for students from lower socioeconomic schools.

REVIEW OF THEORY AND EVIDENCE

To assess the impacts of socioeconomic backgrounds and high school contexts on postsecondary enrollment we draw from theories and perspectives centered on the notion that an individual's behavior is determined and best understood within the situational context in which the behavior occurred (Bourdieu, 1986; Lin, 2001). Our conceptualization is largely shaped by perspectives that address college access from an individual and organizational perspective (Hossler, Braxton, & Coopersmith, 1989; Paulsen, 1990; Perna, 2006), incorporating conceptual elements from research situating educational decision-making within social and institutional environments. To examine the influence of high school socioeconomic environments on students' college enrollment, we incorporate theoretical and empirical work on the impacts of social and cultural resources, as well as economic, financial and informational resources. In the section that follows, we summarize the relevant theory and evidence that formed the basis for the study.

SOCIAL AND CULTURAL RESOURCES

From a sociological perspective, the work of Bourdieu (1986) and Lin (2001) situate students within contexts defined by social and cultural resources. Resources accessed through social networks, or, social capital, provide students with peer groups as well as family and community ties that contribute to their ongoing socialization in developing values, aspirations, and forming educational choices (Coleman, 1988; Lin, 1999; Vreeland & Bidwell, 1966; Weidman, 1989). The related concept of habitus has been used in college choice research to explain how an internalized system of thoughts, beliefs, and perceptions acquired through one's parents or immediate community shapes the college choice process for students (Engberg & Wolniak, 2010; McDonough, 1997; Paulsen & St. John, 2002; Perna & Titus, 2005).

McDonough's (1997) examination of the organizational habitus of high schools provided important information on the ways in which students' college choice processes are shaped by the interaction among organizational structures and the social class of high schools. Focusing on the high school socioeconomic context in combination with school-level guidance and admissions norms, McDonough's qualitative analyses revealed that the college application and admissions processes of students within low-SES schools are constrained by the resources of the school, particularly those related to the guidance counseling process. Independent of academic merit, it appears that the socioeconomic qualities of high schools delimit the range of choices available to students and thereby influence students' ability to negotiate the college choice process. Ultimately, these differences act to accentuate existing disadvantages among students from lower social classes.

In addition to McDonough's (1997) research, a number of recent studies provide empirical support for studying the organizational habitus of high schools when investigating the college choice process. Perna and Titus (2005), for instance, showed that organizational norms that support parent-to-school involvement exert an influence on four-year college enrollment over and above individual influences. Likewise, Engberg and Wolniak (2010) demonstrated that several aspects of the high school habitus influenced four-year enrollment over and above individual attributes, including the larger socioeconomic environment and organizational norms characterized by college-going aspirations, parent-to-parent contact, and peer networks. Additionally, Engberg and Wolniak (2010) and Hill (2008) established that organizational resources designed to facilitate the college-linking process improved the likelihood of college attendance, particularly resources that inform students about the financial aid and college choice process.

In addition to these works, studies also suggest that the resources informing educational decisions are not equally distributed to all high school students, but are determined in part by differences in socioeconomic and institutional resources and policy-driven changes in college admissions criteria (Alon & Tienda, 2007; Engberg & Wolniak, 2010; Massey, Charles, Lundy, & Fisher, 2003; Perna & Titus, 2005; Wolniak & Engberg, 2007). For example, Alon and Tienda (2007) demonstrated that admission criteria incorporating measures of academic performance that include aspects of the high school context, such as class rank, are more socially equitable and compatible with achieving institutional diversity goals, and act to compensate for historical disadvantages among minority students. Furthermore, Wolniak and Engberg (2007) have shown that feeder networks established between high schools and colleges promote college enrollment generally across all students, while exerting a relatively stronger affect for academically less accomplished students and students who did not apply for financial aid. This evidence suggests that access to feeder networks may in some instances compensate, and in other instances accentuate, existing disadvantages among students.

ECONOMIC, FINANCIAL, AND INFORMATIONAL RESOURCES

From an economic perspective rooted in human capital theory, educational decisions are based on rational assessments of expected monetary and non-monetary returns associated with acquiring more advanced education (Becker, 1993; Cohn & Geske, 1990; Paulsen, 2001). Like all consumers, students respond to incentives, with expectations and behaviors embedded in different choice settings that determine levels of risk tolerance and sensitivities towards time valuation and discount rates (Nee & Ingram, 1998). Thus, we can understand postsecondary education decisions according to academic accomplishments (Adelman, 1999; Perna, 2000, 2004), availability of financial resources (e.g., student financial aid, current loan limits; Ellwood & Kane, 2000; Paulsen, 2001), and access to information (Perna, 2006).

One of the strongest human capital predictors of college enrollment is academic preparation (Perna, 2004), which researchers have operationalized using numerous constructs ranging from enrollment in college

preparatory tracks (e.g., Perna, 2000) to the highest level of mathematics coursework completed (e.g., Adelman, 1999; Perna & Titus, 2005). More direct measures of academic preparation or achievement, such as standardized test scores (e.g., Perna & Titus, 2005, Perna, 2000) and high school grade point averages (e.g., Ellwood & Kane, 2000), demonstrate a strong relationship with enrollment in postsecondary education (Perna, 2000).

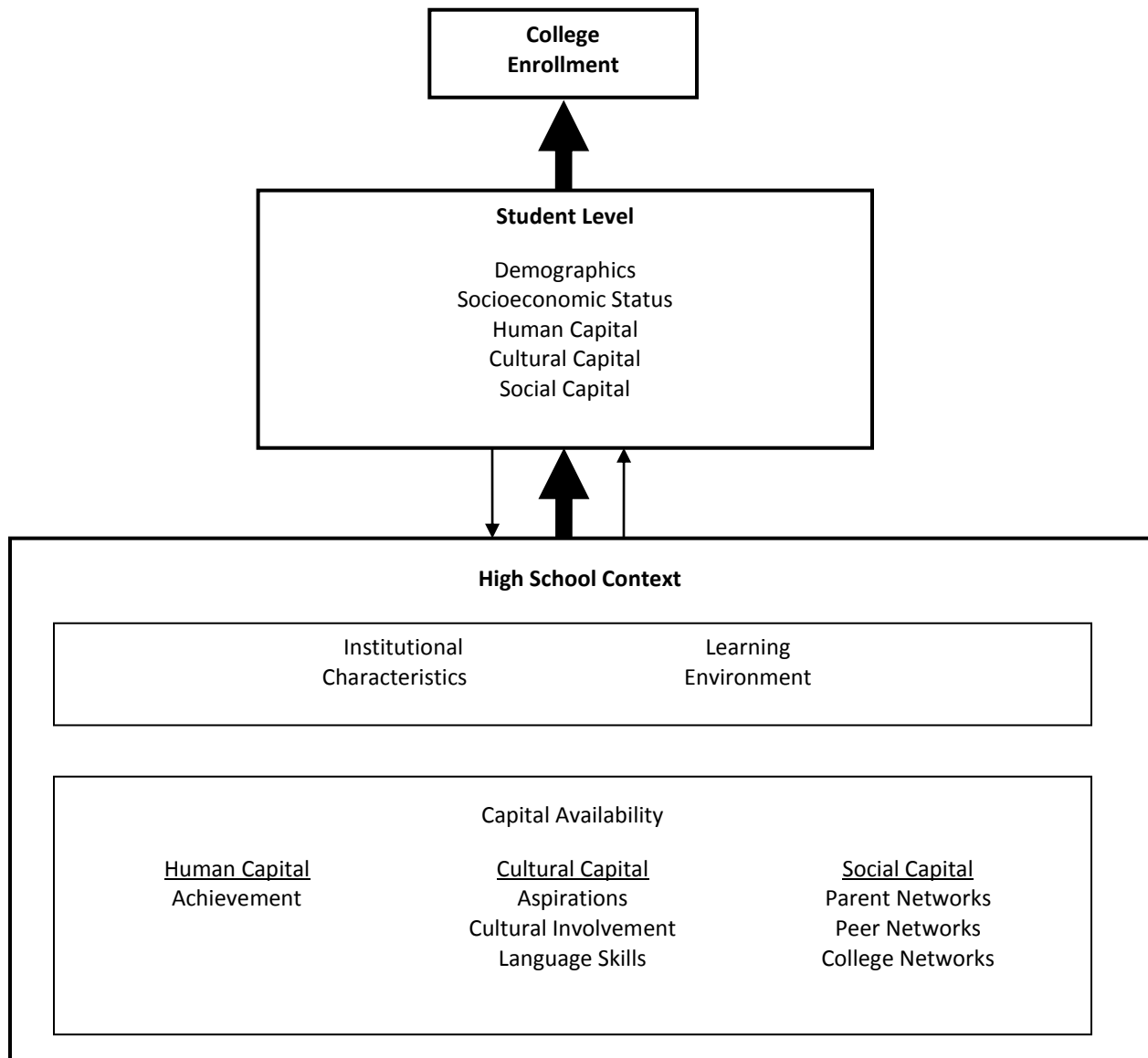
Enrollment in postsecondary institutions is also a function of family income and other economic resources (Ellwood & Kane, 2000). Researchers have shown that the enrollment decisions of students from lower-income families are more sensitive to changes in college costs and financial aid (Avery & Hoxby, 2004; Haveman & Smeeding, 2006). Similar to financial resources, students' decisions about college are predicated on access to information and an understanding of the college choice process. Limited access to information and a lack of understanding of college choice may particularly disadvantage first-generation students (Bozick & Lauff, 2007), and these differences in informational resources may partially explain disparities in college enrollment among low-income, Black, and Hispanic students (Hill, 2008; Perna, 2006).

SUMMARY OF THEORY AND EVIDENCE

The above perspectives provide a theoretical and empirical basis for examining the relationship between students' access to resources, educational contexts, and college enrollment outcomes. Within this framework, economic, financial, and informational resources exists alongside other forms of capital (i.e., human, social, and cultural), such that families with greater resources are more likely to access and benefit from better schooling.

With the present study we focus on differences across high school socioeconomic contexts to address the interdependent relationships among students, their high schools, and college enrollment. We recognize that differential access to socioeconomic and educational resources within a given high school may have a lasting effect on students' postsecondary enrollment (Grotsky, 2007; Karen, 1990; Rosenbaum, 1978; Turner, 1960), and we seek to empirically establish the ways in which high school structures and environments may compensate or accentuate disadvantages based on the SES of high schools.

Based on previous studies (e.g., Alexander & Eckland, 1977; Bain & Anderson, 1974; Coleman, et al., 1966; Davis, 1966; Hill, 2008; Khattab, 2005), we operationalized postsecondary enrollment according to whether students attend four-year institutions, two-year institutions, or do not attend a postsecondary institution following high school graduation, and define the high school context according to institutional characteristics (e.g., sector, region, diversity, and socioeconomics) and the availability of resources (i.e., human, cultural, and social capital). Exhibit 1 presents a conceptual framework of college enrollment incorporating the student- and school-level variables discussed in this section.

Exhibit 1. Conceptual Framework of College Enrollment

PURPOSE AND RESEARCH QUESTIONS

The purpose of the study is to examine the interrelationships between socioeconomic status, and high school contexts, and postsecondary enrollment. Drawing on a nationally representative sample of high school seniors from the Educational Longitudinal Survey (ELS), we seek to broaden our empirical understanding of student- and school-level influences on attending two- and four-year postsecondary institutions. In doing so, we examine the critical roles that human, cultural, and social capital exert on college enrollment, emphasizing how the acquisition and availability of these resources at both the student and

school levels are influenced by the high school socioeconomic context. Employing advanced hierarchical modeling techniques, we account for the nested nature of our data and identify the extent to which aspects of the high school context and student predictors of college enrollment may compensate or accentuate disadvantages when analyzed across schools of relatively low, middle, and high SES.

By answering the following research questions we document how students' access to resources differ according to the socioeconomic context of high schools, and provide a comprehensive examination of the interrelationships between SES and the likelihood of two-year, four-year versus no postsecondary enrollment:

Access to resources by school socioeconomic contexts

Q1: Do students' enrollment decisions and access to resources differ by the socioeconomic status of their high school?

Student- and school-level determinants of postsecondary enrollment

Q2: In what ways do student-level characteristics influence the likelihood of postsecondary enrollment, controlling for differences across school-level measures of the high school context?

Q3: In what ways do school-level characteristics influence the likelihood of postsecondary enrollment, controlling for differences in student-level characteristics?

Moderating effects of the high school socioeconomic context

Q4: Does the high school socioeconomic context moderate student-level determinants of postsecondary enrollment?

Conditional effects of the high school socioeconomic context

Q5: Do student-level determinants of postsecondary enrollment differ across high school socioeconomic contexts, controlling for the availability of resources at the high school level?

Q6: Do school-level determinants of postsecondary enrollment differ across high school socioeconomic contexts, controlling for differences in student-level characteristics?

METHODS

DATA DESCRIPTION

Data for this study were drawn from the Education Longitudinal Study of 2002 (ELS), a survey research project funded through the Institute of Education Sciences on behalf of the U.S. Department of Education. The ELS study is designed to measure students' transitions from secondary to postsecondary education and/or the workforce. The ELS study is both longitudinal, surveying the same group of students over time, and multi-level, collecting information from multiple respondent pools that include students, parents, teachers, librarians, and schools. These data are particularly well-suited for research on how student demographics, high school contexts, and other aspects of the college choice process affect postsecondary attendance.

ELS questionnaires were completed by approximately 15,400 students during the spring of their sophomore year at 750 high schools. Given the nested design of the study, high schools were first selected based on 24 strata, with approximately 26 students selected in each high school with some oversampling of Asian Americans/Pacific Islanders. Students were surveyed again in 2004 during their senior year (with some freshening), and again in 2006. This study focuses on members of the 2004 high school senior sample (G12COHRT=1) who participated in the second follow-up interview (F2F1WT=1). The final analytic sample, therefore, included 11,940 students attending 740 diverse high schools, with weighted samples representing approximately 2.9 million students from 22,662 high schools.

VARIABLES IN THE STUDY

Socioeconomic Classification. In order to develop a meaningful segmentation of the high school SES context, we relied on two primary data sources. First, we used data from the Common Core of Data (CCD) to calculate the percentage of students on free/reduced school lunch plans. Second, we used the SES indicator provided in the ELS dataset, which includes information on household income, parent educational attainment, and parent occupation, to construct an aggregate school-level measure of SES. For both data elements, we used the Blom proportional ranking technique to rank all schools in the sample from 0 to 1. We then constructed an index that used the free/reduced lunch measure for all public schools (91% of sample) and the school-level SES measure for all private schools. Despite relying primarily on the free/reduced lunch measure, both measures were highly correlated with the final index ($r=.94$ for both measures). We then divided the sample into three equal groups, representing low, middle, and high SES school groups.

Dependent Variable. The dependent variable for the study was a multinomial outcome that captured three enrollment classifications: two-year enrollment, four-year enrollment, and no-enrollment.

Approximately 25% of the analytic sample attended a two-year institution, 44% attended a four-year institution, and the remaining 31% were not enrolled in a postsecondary institution in 2006.

Demographic and Socioeconomic Variables. In order to capture the importance of individual background characteristics, we created dummy variables for gender and race. The racial classification included White, Asian, Black, Hispanic, White, and Biracial groups, with White students serving as the referent group. As explained above, the SES index is a continuous measure constructed by NCES researchers to capture multiple dimensions of SES and includes no missing information (see Ingels, Pratt, Rogers, Siegel, & Stutts, 2004 for more information on the imputation procedures used to construct the SES index). The high degree of colinearity among income, educational attainment, and occupational status necessitates a more parsimonious treatment of these variables in multivariate modeling.

Human, Cultural, and Social Capital Constructs. In operationalizing key elements of our college choice framework, we utilized several different analytic procedures. To capture the academic preparation dimension of human capital formation, we relied on three different academic measures: First, we used a metric pertaining to the number of AP courses taken by a student. Second, we used a measure of students' grade point average taken directly from the high school transcript. Third, we used a measure that captures the highest level of mathematics achievement in high school, which ranged from no math to advanced calculus (see Adelman, 1999). In order to create an index of these three measures, given their high degree of colinearity, we standardized each of these metrics and took the mean score based on the available data for each student.

We created two scales to capture different dimensions of cultural capital formation. First, we developed a scale designed to capture the extent to which a student's parents, relatives, and close friends had aspirations for the student to attend college. The scale specifically measures the aspirational intensity of four proximal influences. Second, we incorporated a scale that captures the frequency in which a student was involved in cultural activities with a parent, including concerts, plays, hobbies, and sporting events ($\alpha=.737$; see Perna & Titus, 2005, for research related to cultural involvement).

A number of social capital constructs were incorporated into the study to capture elements of parent, peer, and college-linking networks. Based on research highlighting the importance of parent involvement (Coleman, 1988; Engberg & Wolniak, 2010; Perna & Titus, 2005), we included two constructs that measured parents' involvement in school-based organizations and the extent to which they knew the parents of their child's friends. The school involvement construct ascertained the percentage of activities a parent was involved in across five different opportunities, including parent-teacher organizations and other school-based organizations. Similarly, the parent-to-parent measure examined the percentage of the student's three closest friends' parents that were known by the student's parents.

Given recent research documenting the importance of peer influences in the college choice process (Perez & McDonough, 2007; Person & Rosenbaum, 2006), we included two continuous, single-item measures designed to capture the number of the student's friends planning on attending either a two- or four-year college. Each measure was based on a five-point Likert scale, ranging from "none" to "all." Finally, we included two scales to capture students' involvement with different influences in relation to the college choice process (see Hill, 2008 for recent research related to college-linking processes). The first scale examined the number of individuals from whom the student sought out college information, which included thirteen possible influences (e.g., counselors, teachers, college representatives). The second scale examined the frequency in which the student discussed school plans with their parents, including grades, preparation for the ACT/SAT, and college choice issues. The six items were measured on a three-point Likert scale that ranged from "never" to "often" ($\alpha=.799$).

School-Level Variables. In order to assess how individual measures of human, social, and cultural capital shape the larger organizational norms of a particular high school, we aggregated each of the above constructs at the school-level. Additionally, we included a number of school-level controls, including sector (i.e., Catholic, private, and public), region (i.e., urban, suburban, and rural), and a measure of structural diversity to capture the percentage of racial/ethnic minorities attending a particular high school. We also incorporated three additional school-level measures based on the ELS school administrator survey. These measures captured the percentage of students in a given high school that attended either a two- or four-year college in 2003 as well as the overall percentage of 12th grade students involved in college-related programs. The latter measure included college application programs, programs on financial aid, SAT/ACT courses, college fairs, and meetings with college representatives ($\alpha =.815$).

ANALYTIC METHODS

We utilized a variety of analytic techniques to prepare the data and answer the study's research questions. First, in order to minimize data loss due to missing data, we used two different approaches. The first approach involved creating a missing data indicator that captured the number of items a respondent was missing based on the analytic model (see Cohen & Cohen, 1983). The second approach utilized a multiple imputation technique for missing data based on a fully conditional specification procedure that utilizes the Markov chain Monte Carlo (MCMC) iterative method (see Li, Raghunathan, & Rubin, 1991; Schafer, 1997).

In order to create the scales used in the analyses, we employed principal axis factoring with a Varimax rotation. All loadings were above .35 and Cronbach's Alpha reliabilities were generally at or above .70, with the exception of two scales that were slightly below this cutoff. Additionally, scales were created either using the mean of the corresponding items or as a composite (Note: factor loadings and item wording are available upon request).

Prior to the multivariate stage of analysis, we conducted a descriptive analysis of the student-level variables and constructs across each of the SES school segments. In doing so, we address our first research question (Q1) and provide an interpretative lens to understand individual differences in access to capital resources across each of the SES school cultures.

The final analytic procedure involved hierarchical general linear modeling (HGLM). HGLM is an appropriate analytic technique to test hypotheses about the relationship between variables at two different levels (Raudenbush & Bryk, 2002), and is particularly useful in understanding how individual- and school-level effects influence college enrollment at two- and four-year institutions. Finally, HGLM corrects for common failures that occur when researchers treat multi-level effects in a non-nested manner; such a process can lead to aggregation bias, miscalculation of standard errors, and heterogeneity of regression (Raudenbush & Bryk, 2002). The ELS dataset is designed to facilitate multi-level modeling, having employed a sampling frame of schools, followed by students within schools.

In using HGLM, we employed a multinomial logit link function to examine the log-odds of a particular type of enrollment (either two- or four-year) against a specified referent group (no enrollment). All student-level and school-level variables were centered on their respective group means as group-mean centering assumes that student-level variables are determined by both individual and school characteristics (Kreft, de Leeuw, & Aiken, 1995). The general multinomial model can be expressed by the following equations:

Level 1

$$\eta_{ij(m)} = \beta_{0j(m)} + \beta_{1j(m)} * (\text{Demographics and Socioeconomics})_{ij} + \beta_{2j(m)} * (\text{Human Capital})_{ij} + \beta_{3j(m)} * (\text{Cultural Capital})_{ij} + \beta_{4j(m)} * (\text{Social Capital})_{ij}$$

where: i denotes the student, j denotes the school, and m denotes the type of enrollment.

Level 2

$$\beta_{0j(m)} = \gamma_{00} + \gamma_{01(m)} * (\text{Institutional Characteristics})_j + \gamma_{02(m)} * (\text{Human Capital Availability})_j + \gamma_{03(m)} * (\text{Cultural Capital Availability})_j + \gamma_{04(m)} * (\text{Social Capital Availability})_j + \mu_{0j(m)}$$

where: j denotes the school and m denotes the type of enrollment.

The descriptive methods employed in the study are designed to specifically answer the study's first research question (Q1) pertaining to differences in student-level resources at low, middle, and high SES high schools. Q2 and Q3 relate to general student- and school-level effects and are addressed through the Level 1 and Level 2 HGLM equations specified above. Q4 asks if the high school SES moderates, or interacts with, student-level predictors in determining postsecondary enrollment and will be addressed by running a slopes as outcomes model (or Level-2 slope equation) for each student-level predictor specified above (Tate, 2004). Finally, Q5 and Q6 ask whether or not student- and school-level determinants are conditional on the SES

status of high schools, such that the equations specified above will be re-run on sub-samples based on classifications of low, middle, and high SES of high schools.

LIMITATIONS

There are several notable limitations to the current study. First, despite the multi-stage design utilized in the ELS, the final sample varied in terms of the number of students who were randomly selected within a particular school. In order to minimize incorrect inferences made at the high school level, we decided to only include those schools with at least five students in the random school sample. Although this led to the elimination of thirteen schools, and therefore limits the generalizability of the results, the sample still represents over 2.9 million students at over 22,000 high schools.

Second, although we utilized the most advanced missing data techniques available, missing data remains a limitation of the ELS. In using multiple imputation methods, we tried to minimize the missing data bias in the study, but our multivariate results do indicate that missing data was not a random occurrence and was indeed linked to students' enrollment decisions. By including a missing data indicator as a covariate in our model, we attempted to further reduce the bias in estimating the net effects of the predictor variables (Cohen & Cohen, 1983).

Finally, it is important to note that the conceptual framework for this study examines a finite number of data elements. While some may argue that these choices are tantamount to an omitted variable bias, such decisions were predicated on a number of factors, including the extant literature on college choice, the relevancy of policy implications, and the previous work by the authors in using the ELS data to examine college choice decisions. While additional measures may add to the overall explanatory power or the analytic models, such decisions are accompanied by concomitant tradeoffs in relation to endogeneity effects and multicollinearity issues.

RESULTS

ACCESS TO RESOURCES BY HIGH SCHOOL SOCIOECONOMIC CONTEXT

To address Q1, we conducted a descriptive analysis of postsecondary enrollment and student-level measures of demographics, socioeconomics, and capital resources across three distinct high school contexts defined according to school socioeconomic status. This approach provided information on differences in students' access to resources and enrollment decisions by the socioeconomic status of their high school.

In examining the mean differences of our dependent and independent variables, we noted several important trends across SES school classifications (see Exhibit 2). First, when examining college enrollment,

we found significant differences across the SES school groups. For instance, the incidence of four-year enrollment was significantly higher in high-SES schools compared to low- and middle-SES schools. Conversely, students attending low- and middle-SES schools were associated with significantly higher levels of two-year college attendance and no postsecondary attendance compared to high-SES schools.

Exhibit 2. Weighted Means for Student-Level Variables by SES School Classification: 2004 high school seniors

Student-Level Variables	Min	Max	Low SES School		Middle SES School		High SES School	
			Mean	S.E.	Mean	S.E.	Mean	S.E.
Enrollment								
No Enrollment	0.000	1.000	0.345**	0.010	0.235**	0.009	0.136	0.009
Two-year Enrollees	0.000	1.000	0.300**	0.011	0.279**	0.011	0.187	0.011
Four-year Enrollees	0.000	1.000	0.354**	0.012	0.486**	0.014	0.678	0.015
Demographics and Socioeconomics								
Female	0.000	1.000	0.520	0.010	0.501	0.009	0.505	0.012
Male	0.000	1.000	0.480	0.010	0.499	0.009	0.495	0.012
Asian	0.000	1.000	0.046	0.007	0.042	0.005	0.049	0.006
Black	0.000	1.000	0.222**	0.016	0.115**	0.012	0.044	0.005
Hispanic	0.000	1.000	0.259**	0.020	0.110*	0.011	0.072	0.008
White	0.000	1.000	0.416**	0.021	0.684**	0.018	0.790	0.013
Biracial	0.000	1.000	0.058	0.006	0.049	0.005	0.046	0.005
SES	-2.120	1.870	-0.271**	0.018	0.068**	0.020	0.425	0.024
Human Capital								
Academic profile	-2.070	3.870	-0.101**	0.017	0.059**	0.021	0.344	0.025
Cultural Capital								
Number of family/friends who desire student to attend college	0.000	4.000	2.464**	0.030	2.622**	0.034	2.817	0.037
Frequency of parent-student involvement in cultural activities	1.000	4.000	2.795**	0.016	2.865*	0.015	2.922	0.016
Social Capital: Parent Networks								
Percentage of school-based organizations parents are involved in	0.000	1.000	0.258**	0.008	0.288**	0.008	0.383	0.011
Percentage of student's friends parents known by student's parents	0.000	1.000	0.686**	0.007	0.711**	0.007	0.760	0.007
Social Capital: Peer Networks								
Number of friends planning to attend 2yr college	1.000	5.000	2.727**	0.022	2.603**	0.025	2.289	0.036
Number of friends planning to attend 4yr college	1.000	5.000	3.119**	0.026	3.361**	0.024	3.726	0.031
Social Capital: College-linking Networks								
Number of individuals from whom student seeks out college entrance information	0.000	13.000	4.843**	0.067	4.957**	0.059	5.445	0.059
Frequency student discusses school and college plans with parents	1.000	3.000	2.192**	0.011	2.228**	0.010	2.272	0.010
Sample size								
Unweighted individual sample ¹			3,730		3,870		4,340	
Weighted individual sample			996,329		1,136,844		775,243	
Unweighted school sample ¹			250		240		250	
Weighted school sample			8,573		7,094		6,995	

Source: ELS: 2002 Restricted Data.

Notes: Sample sizes have been rounded to the nearest tenth based on ELS restricted data policy. Asterisks show significant mean differences against High SES group:

* $p < 0.01$; ** $p < 0.001$.

Second, when examining racial group differences, both low- and middle-SES schools had significantly higher proportions of Black and Hispanic students compared to high-SES schools. Conversely, White students made up the largest percentage of students in the high-SES groups (almost 80%), with Black and Hispanic students only representing 4% and 7% of the student population in the high-SES schools, respectively. Asian students, however, were more evenly represented across the different school groups. Further, when examining socioeconomic differences within the SES-school groupings, students in the lowest group were almost three-tenths of a standard deviation below the mean, whereas students in the high-SES group were four-tenths of a standard deviation above the mean. Third, in examining students' access to human, social, and cultural resources, the trends were generally consistent, with low-SES and high-SES schools associated with the lowest and highest amount of resources, respectively. On average, students attending low- and middle-SES schools were less prepared academically, possessed fewer cultural resources, and had lower levels of parent involvement compared to their high-SES counterparts. In terms of peer networks, students attending low- and middle-SES schools were associated with significantly higher numbers of friends attending two-year colleges compared to the high-SES group; the reverse trend was found when examining the number of friends attending a four-year college. Finally, students attending high-SES schools were significantly more likely to seek out college information from a larger number of sources when compared to the middle- and low-SES groups.

DETERMINANTS OF POSTSECONDARY ENROLLMENT

Building upon the descriptive results, we applied a multivariate approach to address Q2 and Q3, which asked about the net impacts of student- and school-level characteristics on students' likelihood of postsecondary enrollment. The associated results are presented in Exhibit 3.

In examining the fully unconditional multinomial logit model, we noted that for students attending the "typical school", the log odds of attending a four-year college were substantially greater than not attending college (odds-ratio = 1.96, $p < 0.001$). However, the effects for two-year enrollment were not significant, suggesting that without any additional controls added to the model, there is little difference among students in the odds of either attending a two-year college or not attending college at all.

Unlike hierarchical linear models (HLM), multinomial HGLM models do not provide an interclass correlation to parse the variance at the student- and school-level. Rather, they provide an estimate indicating if the variation between schools is significant. Relative to no attendance, there was statistically significant variation between schools in the log-odds of attending either a two-year (variance component = 0.336, $p < 0.001$) or four-year college (variance component = 0.852, $p < 0.001$).

Exhibit 3. Multinomial HGLM representing the odds of enrolling in a two- or four-year college relative to not enrolling: 2004 high school seniors

Estimated Fixed Effects (intercepts only)	Two-Year Exp(B)	Four-Year Exp(B)
Student-Level		
<i>Demographics and Socioeconomics</i>		
Female	1.078	0.912
Asian	1.484*	1.185
Black	0.915	1.530***
Hispanic	0.944	0.745*
Biracial	0.637**	0.978
SES	1.282***	1.549***
<i>Human Capital</i>		
Academic profile	1.745***	6.846***
<i>Cultural Capital</i>		
Number of family/friends who desire student to attend college	1.396***	1.634***
Frequency of parent-student involvement in cultural activities	1.089**	1.094**
<i>Social Capital: Parent Networks</i>		
Percentage of school-based organizations parents are involved in	0.934	1.025
Percentage of student's friends parents known by student's parents	1.085**	1.137***
<i>Social Capital: Peer Networks</i>		
Number of friends planning to attend 2yr college	1.035	0.747***
Number of friends planning to attend 4yr college	1.071*	1.380***
<i>Social Capital: College-linking Networks</i>		
Number of individuals from whom student seeks out college entrance information	1.174***	1.306***
Frequency in which student discusses school and college plans with parents	1.155***	1.271***
<i>Total missing</i>	0.886***	0.832***
School-Level		
<i>Institutional Characteristics</i>		
Catholic	1.926***	1.423*
Other private	1.419	1.292
Suburban	1.100	0.911
Rural	1.047	0.930
Structural diversity	0.998	1.000
School SES	1.006***	1.010***
<i>Human Capital Availability</i>		
Average academic profile	2.329***	5.493***
<i>Cultural Capital Availability</i>		
Average number of family/friends who desire student to attend college	2.189***	2.189***
Average frequency of parent-student involvement in cultural activities	1.092	1.092
<i>Social Capital: Parent Network Availability</i>		
Average percentage of school-based organizations parents are involved in	1.185	1.148
Average percentage of student's friends parents known by student's parents	0.980	1.147
<i>Social Capital: Peer Network Availability</i>		
Average number of friends planning to attend 2yr college	1.664***	0.592***
Average number of friends planning to attend 4yr college	1.139	2.326***
Percentage of 2003 students who attend 2yr colleges	1.186***	0.895*
Percentage of 2003 students who attend 4yr colleges	1.019	1.187***
<i>Social Capital: College-linking Network Availability</i>		
Average number of individuals from whom student seeks out college entrance information	1.192	1.324
Average frequency in which student discusses school and college plans with parents	0.908	1.017
Percentage of students in college-related programs	1.048	1.138***
<i>Random effect (variance component of intercept)</i>	0.133***	0.191***

Source: ELS: 2002 Restricted Data.

Notes: Due to space limitations, only odds ratios are presented. Beta coefficients and standard errors are available upon request.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

STUDENT-LEVEL EFFECTS

In examining the student-level model, we uncovered a number of significant findings (see Exhibit 3). In terms of demographic characteristics, we found Black students to be significantly more likely than White students to attend a four-year college. We also found that students who identified as biracial were less likely to attend a two-year college than their White counterparts. Socioeconomic status was the only consistent finding across the two- and four-year enrollment groups in our first set of variables, suggesting that as socioeconomic status increases, students are significantly more likely to attend a two- or four-year college versus not enrolling at any college.

In terms of the human capital measure of academic performance -- an indexed measure of grade point average, AP courses taken, and the highest level of mathematics -- the results highlight the salience of students' academic performance during high school in fostering an increased likelihood of attending a postsecondary institution. The stronger a student's academic profile, the more likely that student is to enroll in any postsecondary institution, while the magnitude of the effect is nearly four-times greater in terms of enrolling in a four-year college. Similar to the human capital measure, we found that cultural capital variables also proved predictive, though the magnitude of the effects did widely differ when predicting enrollment in two- versus four-year colleges.

In examining the various measures of social capital, we found significant positive effects on two- and four-year enrollment in relationship to the percentage of students' friends known by his or her parents, as well as the number of friends planning to attend a four year college. The number of friends planning to attend a two-year college did not affect the likelihood of two-year enrollment, and negatively affected the likelihood of attending a four-year college. Furthermore, college-linking networks proved beneficial in increasing the likelihood of attending both two- and four-year colleges, although the effects related to seeking out college information and discussing plans for school and college with one's parents were both higher in terms of four-year college attendance.

Thus, at the student-level, parent and peer networks proved important factors in increasing the chances of attending a four-year college, while college-linking networks universally increased the odds of college attendance. Finally, it should be noted that the missing value indicator had a significant influence on college enrollment, suggesting that students with higher levels of missing data were less likely to attend either two- or four-year institutions.

SCHOOL-LEVEL EFFECTS

Our school-level model revealed a number of interesting effects related to the high school context, many of which differentially affected two- and four-year enrollment (see Exhibit 3). For example, institutional characteristics similarly influenced two- and four-year enrollment, with students who attended Catholic

(versus public) high schools were more likely to attend two-year and four-year colleges compared to public high schools. Additionally, the average socioeconomic status of a high school proved to be an important and positive indicator of two- and, in particular, four-year college enrollment.

In examining the school-level availability of human capital, we found similar effects as we did at the student level, suggesting an important advantage for students attending academically rigorous high schools, primarily in terms of four-year college attendance. In terms of cultural capital availability, the likelihood of enrolling in a two- or four-year college increases as the average level of college aspirations increases for friends and family.

In terms of school-level measures of social capital, peer networks proved especially important at the school-level for increasing the odds of college attendance. As more peers attended or planned on attending a two- or four-year college, the odds of attending a two- or four-year college increased, respectively. For four-year colleges, in particular, high averages of students attending two-year colleges significantly decreased the odds of attending a four-year college. In terms of college-linking networks, as the percentage of students enrolled in college-related programs increased, so too did the likelihood of attending a four-year college, although the same was not true for two-year college enrollment.

MODERATING EFFECTS OF THE HIGH SCHOOL SOCIOECONOMIC CONTEXT

Extending the HGLM approach discussed in the previous section, we answered Q4 by estimating a slopes as outcomes model using a Level-2 slopes equation to identify if the SES of students' high schools moderate (or interact with) student-level predictors when determining two-year and four-year enrollments. Exhibit 4 displays the resulting interactive effects, where each parameter estimate shows whether or not the relationships between the student-level variables and two-year and four-year enrollment vary according to the high school SES.

Overall, we uncovered little evidence that the slopes of the student-level predictors on college enrollment are moderated by the SES of the high school. In other words, it appears that the impact of students' demographic, socioeconomic and capital resources are, for the most part, stable across different levels of high school SES. Specifically, the socioeconomic level of the high school did not significantly moderate the relationships between student-level measures, including demographic and socioeconomic characteristics, human capital, as well as peer and college-linking network resources, and two- and four-year college enrollment in relation to no enrollment. The exceptions to this finding are with respect to the impact of parent-student involvement in cultural activities on four-year enrollment, and the impact of parental involvement in school-based organization on both two- and four-year enrollment. The effects that these two measures have on postsecondary enrollment increase in strength as the high school SES increases.

Exhibit 4. Effect of high school SES on student-level predictors of two- or four-year college relative to not enrolling: 2004 high school seniors

Estimated Fixed Effects (slopes only)	Two-Year (B)	Four-Year (B)
<i>Demographics and Socioeconomics</i>		
High School SES x Female	0.002	0.006
High School SES x Asian	0.006	0.001
High School SES x Black	0.005	-0.004
High School SES x Hispanic	0.002	0.001
High School SES x Biracial	0.008	0.004
High School SES x SES	0.003	0.004
<i>Human Capital</i>		
High School SES x Academic profile	-0.002	0.001
<i>Cultural Capital</i>		
High School SES x Number of family/friends who desire student to attend college	-0.001	-0.002
High School SES x Frequency of parent-student involvement in cultural activities	0.001	0.004*
<i>Social Capital: Parent Networks</i>		
High School SES x Percentage of school-based organizations parents are involved in	0.004*	0.004*
High School SES x Percentage of student's friends parents known by student's parents	0.001	0.002
<i>Social Capital: Peer Networks</i>		
High School SES x Number of friends planning to attend 2yr college	-0.001	-0.001
High School SES x Number of friends planning to attend 4yr college	-0.001	0.001
<i>Social Capital: College-linking Networks</i>		
High School SES x Number of individuals from whom student seeks out college entrance information	-0.003	-0.001
High School SES x Frequency in which student discusses school and college plans with parents	0.000	0.002

Source: ELS: 2002 Restricted Data.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

CONDITIONAL EFFECTS OF THE HIGH SCHOOL SOCIOECONOMIC CONTEXT

To address Q5 and Q6 we examined if student- and school-level determinants of postsecondary enrollment may be conditional on (or differ according to) the SES of high schools. By re-running our analytic model on sub-samples defined according low, middle, and high socioeconomic classifications of high schools, we provide evidence on whether or not structures, environments, and resources may compensate or accentuate disadvantages based on the SES of high schools.

TWO-YEAR ENROLLMENT EFFECTS

As a precursor to examining the full model effects, we first examined the fully unconditional two-year model for each of the SES groups. While the models were significant for all groups, we noted important differences in the likelihood of attending a two-year college compared to no attendance across the school groupings. Students in the low-SES group, for instance, were less likely to attend a two-year college, whereas students in the middle- and high-SES schools were more likely to attend a two-year college compared to not enrolling in a postsecondary institution. Additionally, in examining the variance components, which indicate whether or not the variation between schools are significant, we noted highly significant variation ($p < 0.001$) in each of the school groups (low-SES = 0.275; middle-SES = 0.298; high-SES = 0.455).

Student-Level Effects

In examining the two-year student level model, we noted several consistent and inconsistent findings across the three school groups (see Exhibit 5). In terms of consistent findings, we found significant effects for the individual-level SES variable in all of the school groupings. Although the odds incrementally increased from low- to high-SES schools, the effects were all positive, demonstrating that even within SES school groupings, an individual's SES remains an important factor in the likelihood of attending a two-year college versus not attending college.

We also uncovered consistent findings across several of the human, cultural, and social capital constructs. Academic profile, for instance, was a highly significant factor in improving one's odds of attending a two-year college, although the effect was most pronounced for students attending middle-SES schools and least pronounced for those attending high-SES schools. Additionally, there were highly significant and consistent effects found in relation to the aspirations for the student to attend college; the likelihood of attending a two-year college versus no attendance increased as the proximal level of influences increased.

There were also several differences in the student-level model across the three school groupings. First, biracial students were less likely to attend a two-year college compared to their White counterparts in low- and middle-SES schools. Second, for students attending middle-SES schools, their odds of attending a two-year college increased based on the number of friends planning to attend a four-year college. Third, the more students from low-SES schools sought out college entrance information from different individuals, the greater their likelihood of attending a two-year college versus no attendance. Finally, for students in both low- and middle-SES schools, their odds of attending a two-year college significantly increased as they engaged in more frequent discussions about college with their parents.

School-Level Effects.

The findings from the school-level model were less consistent across the different school groupings (see Exhibit 5). In fact, the only consistent finding was related to the average academic profile of a school, which corresponded to higher odds of attending a two-year college.

Several differences were uncovered across the various school groupings. Catholic schools, compared to public institutions, were associated with greater odds of attending a two-year college in middle- and high-SES schools; no effect was found in the low-SES group. Further, whereas the individual-level aspirations exerted a significant effect across all three groups, school-level effects were only noted in low- and middle-SES schools. Thus, the stronger the organizational norms are in terms of college-going aspirations for students, the more likely students in low- and middle-SES schools are to attend a two-year college versus foregoing the decision to attend college.

Exhibit 5. Multinomial HGLM representing the odds of enrolling in a two-year college relative to not enrolling: 2004 high school seniors

Estimated Fixed Effects (intercepts only)	Low SES School <i>Exp(B)</i>	Mid SES School <i>Exp(B)</i>	High SES School <i>Exp(B)</i>
Student-Level			
<i>Demographics and Socioeconomics</i>			
Female	1.012	1.175	1.081
Asian	0.868	1.179	1.622
Black	0.727	0.775	1.210
Hispanic	0.807	1.075	0.843
Biracial	0.486*	0.539*	0.684
SES	1.182*	1.327***	1.390**
<i>Human Capital</i>			
Academic profile	1.852***	1.971***	1.682***
<i>Cultural Capital</i>			
Number of family/friends who desire student to attend college	1.411***	1.299***	1.483***
Frequency of parent-student involvement in cultural activities	1.064	1.079	1.073
<i>Social Capital: Parent Networks</i>			
Percentage of school-based organizations parents are involved in	0.865*	1.038	1.029
Percentage of student's friends parents known by student's parents	1.085	1.012	1.138
<i>Social Capital: Peer Networks</i>			
Number of friends planning to attend 2yr college	1.070	1.024	0.987
Number of friends planning to attend 4yr college	1.056	1.151*	0.886
<i>Social Capital: College-linking Networks</i>			
Number of individuals from whom student seeks out college entrance information	1.251***	1.143	1.055
Frequency in which student discusses school and college plans with parents	1.254***	1.252**	1.180
<i>Total missing</i>	0.884**	0.854***	0.882*
School-Level			
<i>Institutional Characteristics</i>			
Catholic	1.156	3.246**	2.649**
Other private	2.057	1.511	1.674
Suburban	1.176	1.116	1.586*
Rural	1.370	1.016	1.126
Structural diversity	0.999	0.995	0.997
<i>Human Capital Availability</i>			
Average academic profile	2.255***	2.194***	2.845***
<i>Cultural Capital Availability</i>			
Average number of family/friends who desire student to attend college	2.504***	2.910***	1.734
Average frequency of parent-student involvement in cultural activities	1.227	0.688	0.862
<i>Social Capital: Parent Network Availability</i>			
Average percentage of school-based organizations parents are involved in	1.020	2.059**	1.026
Average percentage of student's friends parents known by student's parents	0.893	1.094	1.413
<i>Social Capital: Peer Network Availability</i>			
Average number of friends planning to attend 2yr college	1.274	1.513*	1.398*
Average number of friends planning to attend 4yr college	0.909	1.193	0.644
Percentage of 2003 students who attend 2yr colleges	1.111	1.258**	1.262
Percentage of 2003 students who attend 4yr colleges	1.019	1.066	1.108
<i>Social Capital: College-linking Network Availability</i>			
Average number of individuals from whom student seeks out college entrance information	1.231	1.088	1.303
Average frequency in which student discusses school and college plans with parents	0.722	0.810	1.365
Percentage of students in college-related programs	1.023	1.140	0.975
<i>Random effect (variance component of intercept)</i>	0.301***	0.397**	0.534***

Source: ELS: 2002 Restricted Data

Notes: Due to space limitations, only odds ratios are presented. Beta coefficients and standard errors are available upon request.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A school culture characterized by higher levels of parental involvement in school-based organizations is associated with higher odds of two-year college attendance for middle-SES schools only. Additionally, as the percentage of students attending two-year colleges increases, so too does the likelihood of two-year attendance for middle-SES students; similar findings were also noted in relation to the average number of friends attending a two-year college, but this finding was significant for both middle- and high-SES schools.

FOUR-YEAR ENROLLMENT EFFECTS

In examining the fully unconditional four-year model, we noted interesting differences in the likelihood of attending a four-year college compared to no attendance across the school groupings. Students in the low-SES group, for instance, were associated with non-significant effects, which suggests that without any additional controls added to the model, there is little difference among low-SES school students in the odds of attending a four-year college versus no attendance. Conversely, highly significant effects were found in the middle- and high-SES school groupings, with students more likely to attend a four-year college compared to no enrollment. Further, in examining the variance components, we noted highly significant variation ($p < 0.001$) in each of the school groups (low-SES = 0.380; middle-SES = 0.461; high-SES = 0.855).

Student-Level Effects

The student-level effects uncovered in the four-year enrollment models were relatively consistent across school groups, although several differences were found in the strength and magnitude of the effects (see Exhibit 5). Similar to the two-year model, both SES and academic profile were highly significant predictors of four-year college attendance; however, the log odds associated with academic profile were appreciably higher in the four-year model compared to the two-year model. Additionally, we found similar effects related to college aspirations across school groups, although the odds for low- and middle-SES schools were higher compared to the two-year model.

Unlike the two-year model, consistent and highly significant effects were found across the constructs associated with peer networks. In general, as the number of the students' friends planning on attending a four-year college increased, so too did the likelihood of attending a four-year college versus no attendance; the opposite association was uncovered in relation to friends attending two-year colleges. It should also be noted that the effect for friends attending four-year colleges was strongest for middle-SES schools and weakest for high-SES schools. Finally, there were consistent effects found in relation to the frequency in which students discuss college with their parents, with more frequent discussions associated with higher likelihoods of attending a four-year college.

In terms of inconsistencies, we noted interesting differences in enrollment propensities for Black and Hispanic students attending low-SES schools. Relative to their White counterparts, Black students were more likely to attend a four-year college whereas Hispanic students were less likely to attend a four-year school. We

also found that stronger parent-to-parent relationships were associated with increased likelihoods of attending a four-year college for students in the high-SES group only. Finally, as students sought out more information about college from different representatives, they were more likely to attend a four-year school, but the effect was only significant for low- and high-SES schools.

School-Level Effects

In exploring the school-level predictors of four-year college enrollment, we noted several consistencies across school socioeconomic categories (see Exhibit 6). Similar to the two-year school model, the average academic profile of students in a school was a strong predictor of four-year college-going, although the four-year school effects were much more pronounced than the two-year school effects. The only other consistent effect across school groupings was related to the average number of friends attending a two-year college: this effect decreased the odds of four-year college attendance for all school groups.

In examining difference among the school groups, we uncovered significant and positive effects for students attending Catholic schools, but only for students attending low- and high-SES schools. Similar to the two-year school model, we found significant school-level effects related to college aspirations only for students attending low- and middle-SES schools. We also uncovered a significant effect at the school-level for parent-to-parent contact, but this only increased the odds of four-attendance for students in high-SES schools.

Finally, we found similar school effects for students attending low- and middle SES schools in relation to both the number of friends and overall percentage of students attending four-year colleges. In both cases, as the number/percentage increased, so too did the likelihood of attending a four-year college versus no enrollment. There was also a positive school effect uncovered for students in middle-SES schools in relation to the percentage of students in college-related programs.

DISCUSSION

This study provides a comprehensive investigation of student- and school-level determinants of college enrollment, the extent to which students' enrollment decisions and access to resources differ by the socioeconomic status of their high schools, as well as the moderating and conditional influences exerted by school socioeconomic status. Methodologically applying descriptive and HGLM techniques to a nationally representative sample of high school seniors, results provide evidence of resource imbalances based on socioeconomic differences among high schools, and that the ways in which resources influence college enrollment propensities at both the student and school level are conditional on the SES of the high school.

Exhibit 6. Multinomial HGLM representing the odds of enrolling in a four-year college relative to not enrolling: 2004 high school seniors

Estimated Fixed Effects (intercepts only)	Low SES School <i>Exp(B)</i>	Mid SES School <i>Exp(B)</i>	High SES School <i>Exp(B)</i>
Student-Level			
<i>Demographics and Socioeconomics</i>			
Female	0.778	1.014	1.009
Asian	0.717	1.500	0.884
Black	1.514*	1.438	1.430
Hispanic	0.590*	1.320	0.618
Biracial	0.846	1.463	0.973
SES	1.423***	1.838***	1.787***
<i>Human Capital</i>			
Academic profile	6.426***	7.646***	6.728***
<i>Cultural Capital</i>			
Number of family/friends who desire student to attend college	1.671***	1.719***	1.497***
Frequency of parent-student involvement in cultural activities	1.005	1.156	1.144
<i>Social Capital: Parent Networks</i>			
Percentage of school-based organizations parents are involved in	0.898	1.138	1.154
Percentage of student's friends parents known by student's parents	1.105	1.052	1.222*
<i>Social Capital: Peer Networks</i>			
Number of friends planning to attend 2yr college	0.780***	0.760***	0.667***
Number of friends planning to attend 4yr college	1.395***	1.525***	1.226*
<i>Social Capital: College-linking Networks</i>			
Number of individuals from whom student seeks out college entrance information	1.321***	1.107	1.443***
Frequency in which student discusses school and college plans with parents	1.245**	1.423***	1.437***
<i>Total missing</i>	0.836***	0.783***	0.871**
School-Level			
<i>Institutional Characteristics</i>			
Catholic	1.742**	1.274	1.981*
Other private	1.253	0.673	1.394
Suburban	0.986	0.685	1.225
Rural	1.478	0.625	0.738
Structural diversity	1.001	0.996	1.000
<i>Human Capital Availability</i>			
Average academic profile	6.544***	6.059***	8.410***
<i>Cultural Capital Availability</i>			
Average number of family/friends who desire student to attend college	1.684*	2.838***	1.382
Average frequency of parent-student involvement in cultural activities	1.041	1.220	0.707
<i>Social Capital: Parent Network Availability</i>			
Average percentage of school-based organizations parents are involved in	1.387	1.998*	0.938
Average percentage of student's friends parents known by student's parents	0.886	1.371	2.494**
<i>Social Capital: Peer Network Availability</i>			
Average number of friends planning to attend 2yr college	0.450***	0.552**	0.387**
Average number of friends planning to attend 4yr college	1.744*	2.149*	1.169
Percentage of 2003 students who attend 2yr colleges	0.836	0.924	0.896
Percentage of 2003 students who attend 4yr colleges	1.289***	1.206*	1.162
<i>Social Capital: College-linking Network Availability</i>			
Average number of individuals from whom student seeks out college entrance information	0.893	1.568	1.645
Average frequency in which student discusses school and college plans with parents	1.262	0.686	1.209
Percentage of students in college-related programs	1.125	1.217**	1.073
<i>Random effect (variance component of intercept)</i>	0.316***	0.509***	0.526***

Source: ELS: 2002 Restricted Data

Notes: Due to space limitations, only odds ratios are presented. Beta coefficients and standard errors are available upon request.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Having first examined resource allocation patterns across low-, middle-, and high-SES schools, we noted that lower-SES schools were associated with the least amount of human, cultural, and social capital as well as the lowest percentages of students enrolling in four-year institutions. While the differences in enrollment patterns for low- versus high-income students have been demonstrated in recent reports (Bozick & Lauff, 2007), few studies have examined resource allocation patterns across a nationally representative sample of schools segmented by socioeconomic classifications. Further, in using data on the percentage of students on free/reduced lunch plans (based on the Common Core of Data) in combination with aggregated data on family income, parental educational attainment, and occupational status (based on the ELS data), we developed a means to classify both public and private schools into meaningful socioeconomic groupings.

Examining a general model based on a pooled sample of high schools, it became apparent that academic performance and aspirations for a four-year college degree stood out as the two largest, most significant predictors of two-year and, most notably, four-year enrollment. Importantly, this was apparent when measured both as student- and as school-level constructs. Thus, academic and cultural resources promote college enrollment for individual students, as well as collectively through the structural or environmental qualities of the high school context. College-linking resources also proved to be significant predictors of two-year and four-year college enrollment, which were most pronounced when measured at the student-level. Finally, a particularly important finding from the general model is that the socioeconomic context of a high school influences enrollment propensities over and above the equivalent individual student measure, providing an empirical basis on which to further examine the moderating and conditional influences of the high school socioeconomic status.

After segmenting the sample by high school SES, results confirm the saliency of student-level SES, academic preparation, and aspirational influences in promoting two- and four-year enrollment across each of the low, middle, and high SES school categories. These findings resonate with existing college choice research (Engberg & Wolniak, 2010; Perna, 2006), particularly theories related to status attainment (Hossler, Schmit, & Vesper, 1999) and human capital theory (Becker, 1993; Catsiapis, 1987). The potency of academic preparation in increasing the likelihood of postsecondary enrollment parallels the current administration's emphasis on developing "world-class academic standards and a curriculum that fosters critical thinking, problem solving, and the innovative use of knowledge to prepare students for college and career" (White House, 2010, n.p.). Such a focus on preparation significantly improves the odds of college attendance for all students across socioeconomic contexts and enrollment categories. High-SES schools, in particular, are associated with the strongest organizational effects in relation to academics, whereas low- and middle-SES schools are associated with stronger organizational effects in relation to aspirational influences. These findings highlight the accentuating and compensatory influences of the high school habitus for high- and low-SES schools, respectively.

For students attending low-SES schools, college-linking networks are particularly important in improving the odds of both two- and four-year college attendance, although the effects are relegated solely to the individual level. Linking students in low-SES schools to different individuals who are knowledgeable about the college choice process plays a particularly important role in students' decisions to attend a two-year college versus not enrolling in college. However, when examining four-year college propensities, college-linking strategies exert a more universal influence across school types, highlighting the importance of connecting students to knowledgeable individuals and imparting the value of college planning to all parents. Given the tendency for low-SES schools to have high counselor-student ratios (McDonough, 1997) and to focus on more “traditional” linking strategies that favor workforce placement (Hill, 2008), an investment in college-linking resources may be an important strategy to improve postsecondary participation rates for students attending low-SES schools.

The findings from the study also illuminate the importance of peer networks at both the individual and school level. These findings substantiate results from earlier studies (Engberg & Wolniak, 2010; Perna & Titus, 2005) and are particularly important in increasing access to four-year institutions. Individuals are inherently embedded in a variety of social networks, and as an individual's propensity to attend college increases, so does the likelihood that other peers in that network will consider the opportunity to attend college. While studies have documented that these “chain” effects can shape college decision-making (Perez & McDonough, 2007; Person & Rosenbaum, 2006), the results from the present study highlight the cumulative effects of college-going networks on the larger organizational norms of a high school. These effects can help counter the access barriers that accompany many poorly resourced schools, as the strength of peer networks in relation to four-year attendance is strongest among students attending low- and middle-SES schools.

Together, the findings from the descriptive and multivariate analyses suggest that high schools both compensate and accentuate existing group differences. Students attending low- and middle-SES schools were associated with the strongest aspirational effects on two- and four-enrollment despite having the lowest average aspirational levels. Similarly, when examining peer influences on four-year enrollment, the effect is more pronounced for low- and middle-SES schools despite being associated with the weakest college-going peer networks. These findings suggest the compensatory role that schools can play by channeling more resources and efforts into cultivating supportive environments that nurture college-going dispositions. However, while low- and middle-SES schools can help to offset individual resource deficiencies, high-SES schools have a tendency to accentuate college-going dispositions through organizational structures and norms that build upon the generally high level of individual resources. Given that middle-SES schools were associated with the highest odds ratios across many of the student- and school-level measures, these schools

may be uniquely positioned to benefit from the reciprocity of compensatory and accentuating effects based on their more heterogeneous composition of individuals and resources.

IMPLICATIONS

There are several important implications that emanate from the study's findings. First, the continued emphasis on human capital investments in our nation's economic recovery is in good keeping with the saliency of academic preparation in promoting college-going behavior. Promoting academic skills and achievement far exceeds any other resource consideration in improving a student's likelihood of attending a four-year college, and to a lesser, albeit still important, degree in attending a two-year college.

Second, investments in students' educational success, whether they originate from parents or other important influences, make a difference not only in the lives of an individual child, but also within the larger organizational culture of a school. Individuals are situated within a number of important organizational contexts, and those contexts can both shape and delimit individual opportunity. For some, their organizational context can help compensate for the lack of individual resources, whereas for others, their situated contexts serve to bolster and reinforce existing advantages. In all cases, understanding the reciprocity between individuals and organizational systems, which has been empirically validated in this study, encourages more deliberate action to combat the reproduction of social inequality that has characterized the American education system for centuries.

Finally, given the weight of peer effects uncovered in this study, at both the student and school levels, the larger challenge relates to removing barriers to access for students in low-SES schools who are associated with the lowest college-going rates. Building a college-going culture is a complex task for schools facing resource shortages, deteriorating infrastructures, out-dated teaching practices, and overcrowded classrooms. As Laura Perna (2006) has suggested, college access involves the interrelatedness of individuals, high schools, communities, postsecondary institutions, and federal and state policies designed to improve postsecondary participation. Too often, however, solutions at one level are inconsistent with policies at the next level, and stronger, more effective partnerships are needed across the K-16 divide. Given the resource imbalances found across schools of differing SES, questions remain as to how to effectively offset these shortages and reengage the social contract of equal opportunity and access to postsecondary education.

While this study has identified factors that compensate for limited access to resources, further research is needed to uncover how and when educational aspirations are formed, how to involve parents in the educational process early on, and how to academically prepare all children using the most promising and advanced teaching practices. Furthermore, while the present study has shown the postsecondary impacts of several student- and school-level factors, more work is needed designing interventions that improve

postsecondary outcomes for students in the most disadvantaged educational environments. To that end, the research presented in this report represents a step towards an improved understanding of the secondary-postsecondary nexus and the conditions that shape students' educational trajectories.

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