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State High School Exit Examinations and Postsecondary Labor Market Outcomes

JOHN ROBERT WARREN, ERIC GRODSKY, AND JENNIFER C. LEE
Michigan State University.

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School Strategies and the “College-Linking” Process: Reconsidering the Effects of High Schools on College Enrollment

Lori Diane Hill
University of Michigan

This study reconsidered school effects on college enrollment by focusing on strategies that schools use to facilitate college transitions. It also examined whether school strategies influence different outcomes for students from different racial/ethnic and socioeconomic backgrounds. Using data from the High School Effectiveness Study, the analysis identified three distinctive “college-linking” strategies: traditional, clearinghouse, and brokering. The results revealed that the strategies that schools use to help students navigate the college-linking process are associated with variation in college enrollment. They suggest that schools that operate primarily as a resource clearinghouse, in which organizational norms limit their role as agents in the college-linking process, foster significant racial/ethnic variation in students’ outcomes.

In recent decades, as postsecondary education has become more important for attainment and mobility in adulthood, high schools are increasingly expected to operate as a link to adults’ opportunities by preparing a larger, more racial/ethnically and socioeconomically diverse, population of students to transition to college (National Center for Education Statistics, NCES, 2005). One of the important ways in which schools facilitate college enrollment is by preparing students and their families to navigate the college-linking process—the process of planning, application, and decision making that culminates in enrollment in college. Despite the rising demand for postsecondary education from students of color and low-income students, stratification in college enrollment continues to reflect disadvantages for these groups (NCES 2005).

Over the past four decades, many sociologists have analyzed school effects on educational outcomes (e.g., Alexander and Eckland 1975, 1977; Alwin and Otto 1977; Bryk, Lee, and Holland 1993; Coleman et al. 1966; Coleman and Hoffer 1987; Coleman, Hoffer, and Kilgore 1982; Falsey and Heyns 1984; Greeley 1982; Lee et al. 1998; McDill, Rigsby, and Meyers 1969; Meyer 1970; Morgan and Sorensen 1999; Sorensen and Hallinan 1977). Although much of that research has focused on academic achievement, scholars have also given considerable attention to understanding the relationship between high schools and college enrollment (Alexander and Eckland 1975, 1977; Alwin and Otto 1977; Coleman and Hoffer 1987; Falsey and Heyns 1984; McDill et al. 1969; Meyer 1970). In general, the findings of these studies have confirmed that although characteristics of students and families substantially affect college enrollment, a high school’s organization-
al characteristics also matter for college transitions.

Research on school effects on college enrollment has strongly suggested that the differences between high schools that matter for the transition to college operate through two dimensions of the school structure: (1) the formal structure, including resources that are relevant for the college-linking process, and (2) organizational norms that communicate values and establish practices that are related to going to college (see Alexander and Eckland 1977; McDill et al. 1969; McDonough 1997; Meyer 1970). This research has further suggested that in high schools, formal structures and norms that are related to college going work together in ways that characterize distinct organizational approaches to facilitating the college-linking process (Falsey and Heyns 1984; McDonough 1997) and that the effects of these approaches or strategies may vary for students from different backgrounds (McDonough 1997). However, few studies have analyzed school effects on college enrollment in terms of the mechanisms (i.e., strategies) that help particular groups of students and families navigate the college-linking process. Research that has compared schools in these terms has been limited in scope (McDonough 1997) and has raised questions about the nature of school strategies and their relationship to students’ outcomes that have yet to be analyzed.

The study presented here built on the analytic framework established in the literature that suggests that school resource structures and norms for facilitating college transitions are an important mechanism through which schools influence college enrollment. Moreover, this mechanism likely reflects distinctive school strategies that have implications for stratification. Using a large sample of high schools and multiple analytic methods, the analysis specifies a typology of college-linking strategies and models their effects on college enrollment, with particular attention to how these effects may differ for disadvantaged students. In this way, the analysis offers an empirical extension of the literature that seeks to shed new light on the nature of stratification among high schools and its implications for students from different racial/ethnic and socioeconomic status (SES) groups. The questions that I address are significant from a sociological perspective because they reveal a type of organizational stratification among schools that has not been thoroughly explored in the literature and can broaden our insights into the ways in which schools influence stratification in postsecondary education. The analysis is also significant from a policy perspective in that it reveals school structures and practices that are linked to group disparities in college enrollment and may be responsive to intervention.

**RESEARCH ON SCHOOL EFFECTS AND COLLEGE ENROLLMENT**

Studies of school effects on college enrollment emerged partly in response to the finding by Coleman et al. (1966) that family background has a greater effect on students’ outcomes than any measured aspect of the school. The broad implication of this finding was that differences between schools matter little for educational outcomes that are stratified by statuses, such as race, ethnicity, and SES. Early research linking school characteristics to college enrollment tested this conclusion by focusing on the effects of school context and composition. Later research considered school effects on college enrollment in studies that were concerned primarily with analyzing differences between public and private schools. Over time, this literature has evolved toward a clearer articulation of the organizational structures and norms that constitute the mechanism for school effects on postsecondary outcomes and toward a more direct focus on how schools help students navigate the college-linking process.

Research in the status attainment tradition that examined the extent to which different school contexts, measured in terms of students’ SES and academic ability (Alexander and Eckland 1977; Alwin and Otto 1977; Meyer 1970; Nelson 1971), affect both college aspirations and college enrollment, found modest positive effects for higher-status schools. Although these studies indicated that differences between schools were associ-
ated with college enrollment, they failed to offer empirically supported insights about how—that is, the mechanism through which schools influenced this outcome. These studies suggested, however, that the effects operated through a school’s formal structure (e.g., guidance resources and curriculum) and through organizational norms that communicate values and establish practices that are related to college going (see, Alexander and Eckland 1977; McDill et al. 1969; Meyer 1970).

In the 1980s, the analytical focus of research on school effects shifted to comparisons of sectors. Early research in this area was criticized for excluding analyses of college enrollment (Coleman et al. 1982). However, later analyses sought to account for sectoral differences in college enrollment in terms of organizational characteristics that differentiated public from private schools. Analyzing data from High School and Beyond, Coleman and Hoffer (1987) argued that private schools more effectively facilitate college enrollment because of “what goes on” (p. 175) in those schools. Their more process-oriented focus provided a clearer indication of how schools affect college enrollment. However, their analysis focused on “what goes on” in schools in terms of students’ academic programs and course taking—that is, the kind of preparation that schools offer students to meet the academic demands of postsecondary education. Thus, their research offered few insights into organizational practices that differentiate schools by how they prepare students to navigate the college-linking process. Nonetheless, by arguing that differences between public and private schools are characterized by variation in key organizational structures (i.e., curriculum) and their norms and expectations about the school’s role as an agent for facilitating educational outcomes, Coleman and Hoffer’s study also advanced the idea that differences between schools that matter for college enrollment operate through the cooperative influence of school structures and norms that are related to college going. Moreover, the study suggested that more analytical attention should be paid to these structures and norms.

In contrast to Coleman and Hoffer (1987), who focused on schools’ structures for academic preparation, Falsey and Heyns (1984:112) argued that disparities in college enrollment between public and private schools are attributable, in part, to “the mechanisms at the disposal of a school, such as counseling programs, that can encourage application to and entry into postsecondary institutions.” They made an important conceptual contribution to the literature on school effects and college enrollment by focusing specifically on organizational characteristics that differentiate schools in terms of how they prepare students to navigate the transition to college. Consistent with other studies in this body of literature that underscored the centrality of resource structures and norms as cooperative influences on college enrollment, Falsey and Heyns’s descriptive analysis highlighted the importance of the formal school structure that provides college counseling resources and a normative orientation (i.e., an organizational commitment) to help students find their way to college. Thus, it revealed school resources and organizational norms that are relevant for helping students navigate the transition to college as the mechanism through which schools influence the college-linking process. Despite their substantial conceptual contribution to this literature, Falsey and Heyns stopped short of modeling the relationship between these school characteristics and students’ enrollment outcomes.

McDonough’s (1997) more recent school-based research, which considered organizational differences among high schools and their relationship to college enrollment, extended this literature in several ways. First, it presented a more thorough elaboration of the framework (i.e., guidance resources and normative orientation toward helping students through the college-linking process) that Falsey and Heyns (1984) proposed for understanding how schools facilitate college transitions. Second, it proposed an analytic approach that reintegrated the concerns of research on school effects and college enrollment with a parallel literature that focused on individual-level effects (e.g., race/ethnicity and SES) on college enrollment (Alexander, Holupka, and Pallas 1987; Beattie 2002;
Hearn 1984, 1991; Karen 1991, 2002; Sewell and Shah 1967; Thomas, Alexander, and Eckland 1979; see also Baker and Velez 1996). This literature documented that race, ethnicity, and SES are associated with postsecondary outcomes in ways that continue to reflect less favorable outcomes for historically disadvantaged groups. Third, McDonough’s study actually analyzed variation between high schools in terms of structures (i.e., college guidance resources) and norms that characterize a school’s approach to preparing students and families to navigate the college-linking process. It suggested that organizational structure, in the form of resources that high schools offer students to facilitate transitions to college, and normative practices, which can influence who gains access to resources, reflect distinct organizational approaches or strategies.

Overall, sociological inquiries into school effects on college enrollment have evolved toward a conceptual framework that identifies schools’ resource structures and organizational norms that are related to college going as the mechanism through which schools influence college enrollment. Moreover, these inquiries have suggested that (1) the organizational mechanisms that are reflected in these dimensions of the school structure indicate different strategies for facilitating college enrollment and that (2) this kind of variation among schools interacts with students’ background in ways that likely inform patterns of stratification in postsecondary education. Thus, previous research proposed a set of relationships among high schools and between high schools and college enrollment that has yet to be systematically analyzed. McDonough’s (1997) study moved the literature furthest in that direction. However, the limited scope of that analysis, in terms of both the size of the school sample and its focus on social-class differences in postsecondary outcomes, leaves unanswered several questions about how much schools vary according to their college-linking strategies, the nature of the strategies they use, and the relationship between school strategies and students’ outcomes:

1. What are the strategies that schools use to facilitate the college-linking process? How do organizational characteristics differ among schools that use different college-linking strategies? How do the background characteristics of students vary among schools that use different strategies?
2. Do different school strategies affect students’ odds of enrolling in college? If so, which strategies more effectively influence college enrollment?
3. Do the relationships between high school strategies and college enrollment differ for students from different racial/ethnic and SES backgrounds? If so, what are the patterns of these differential relationships, and what are the implications?

This article addresses these questions by drawing on the conceptual framework outlined in the literature that suggests that differences between schools that matter for college transitions operate through two dimensions of a high school’s organizational structure: resources that are relevant for college going and aspects of the normative structure that have implications for college transitions. Thus, I measured college-linking strategies in terms of the cooperative influence of school characteristics that indicate organizational-level capacity (resources) and commitment (norms) to helping students navigate the college-linking process (see Stanton-Salazar and Dornbusch 1995). In doing so, I sought to render an empirical extension of the literature that provides new insights into the extent to which schools use different strategies to facilitate college transitions, how these strategies affect college enrollment, the extent to which the strategies shape distinctive outcomes for different racial/ethnic and SES groups, and how the strategies may be related to persistent patterns of stratification in postsecondary education. Research on educational inequality has found that disadvantaged students and their families tend to be more dependent on their schools for access to resources that are related to postsecondary educational attainment. However, these groups are less likely to seek such resources on their own. Thus, given that college-linking strategies reflect organizational variation not only in the level of resources that schools pro-
vide, but in the school practices that facilitate access to available resources, I expected to find that college-linking strategies would differ in their affects on students from different social backgrounds.

DATA AND SAMPLE

To examine the relationship between the strategies that high schools use to facilitate college enrollment and students’ postsecondary outcomes, I used data from the High School Effectiveness Study (HSES), which was conducted in conjunction with the first and second follow-ups of the National Education Longitudinal Study (NELS:88–94). Along with a cross-sectional sample of 10th-grade students and high schools in 1990, the HSES data set contains longitudinal school and student samples for the 30 largest Metropolitan Statistical Areas. The sample includes urban and suburban high schools in which at least five students from the original NELS:88 sample were enrolled. The sample of NELS:88 students in each high school was augmented to create a representative sample of students for each school in HSES.

The two-level structure shared by NELS and HSES allows both data sets to be used in multilevel analyses. However, unlike NELS, HSES was designed specifically to support longitudinal analyses of the effects of school organizational characteristics on students’ outcomes. More specifically, HSES was intended to address emerging questions related to the organization of urban schools and interactions between high schools and students’ characteristics (Scott et al. 1996). The multilevel structure of the HSES data set, along with design features that capture a sample of high schools serving a disproportionate number of disadvantaged students, makes HSES especially appropriate for addressing the kinds of questions about school effects on patterns of stratification in postsecondary education that I considered in the analysis.

The sample for this study included 188 schools for which 1990 and 1992 survey data were available. The student-level sample included 1,354 students and was restricted to members of the NELS:88–94 panel who attended the same school in the 10th and 12th grades and for whom postsecondary outcome data were available. Missing values for school- and student-level independent variables were imputed using IVEware Imputation and Variance Estimation software (for a complete discussion of this multiple imputation technique, see Raghunathan et al. 2001).

MEASURES

The study addressed research questions about the types of strategies that schools use to facilitate the college-linking process and about how the strategies are associated with college enrollment. Thus, the analysis proceeded in two stages. In the first stage, I used a latent class model to identify and compare college-linking strategies. In the second stage, I used two-level multinomial hierarchical models to examine the relationship between school strategies and college enrollment. The student- and school-level measures that are described next were constructed using data from the first and second follow-ups of HSES and the second and third follow-ups of NELS:88–94.

Student Measures

The dependent variable for the hierarchical model predicting college enrollment was a three-category measure indicating whether a student was not enrolled in college, enrolled in a two-year institution, or enrolled in a four-year institution in the fall following high school graduation. As I mentioned earlier, the student sample for this analysis consisted of students in HSES schools who were members of the NELS:88–94 panel and for whom data on postsecondary enrollment were available. Thus, the outcome measure was constructed using a variable from the NELS third follow-up.

One objective of this study was to understand whether college-linking strategies are associated with different outcomes for students from different racial/ethnic and socioeconomic backgrounds. Therefore, student-
level independent variables included *race/ethnicity* (indicators for Asian, black, and Latino, with white as the reference category), *parent’s highest educational level* (1 = high school or less, 2 = some college, 3 = bachelor’s degree, 4 = BA+), and *parent’s income*. In keeping with the convention of research that has found that students’ ascriptive characteristics, including family resources that are relevant for college going, academic performance, and educational expectations have significant effects on students’ postsecondary educational outcomes (see, e.g., Hearn 1991; Karen 2002), the model included controls for *gender* (1 = female, 0 = male), *academic achievement*, and *grade point average*.

Student measures also included a control for the influence of *family-based college planning resources*. Although this study was concerned primarily with understanding how schools help students navigate the college-linking process, students’ families may also provide resources (e.g., information about specific colleges or assistance with the college application process in general) that have practical implications for the college-linking process. These resources are distinct from measures of family background, such as parental education, because they reflect a family’s active engagement in facilitating a student’s transition to college (see Coleman and Hoffer 1987; McDonough 1997). To capture the normative component of the college-linking strategy, as reflected in the school’s commitment to the equitable distribution of college-related resources, I used a measure of school-initiated outreach to families regarding the college planning process. Each variable was coded dichotomously to indicate whether the school engaged in a practice “often” or “less than often.”

**School Measures**

**College-Linking Strategies** The college-linking strategies were measured using a latent class measurement model (discussed later). As I have pointed out, a school’s strategy for facilitating the college-linking process is conceptualized in terms of the cooperative influence of two dimensions of its organizational structure: school resources that help students navigate the transition to college and organizational norms that establish practices that are related to college going. For this study, I focused specifically on school practices that reflect organizational commitment to the equitable distribution of these resources to students and their families (see Stanton-Salazar and Dornbusch 1995). These normative practices are informed, in part, by assumptions that high schools make about the kind of assistance that students need from their schools to transition to college (McDonough 1997). This focus is important, given the study’s concern with understanding whether these strategies influence different outcomes for advantaged and disadvantaged students. Thus, to operationalize the resource dimension of the college-linking strategies, I used four measures of school practices that facilitate college going: (1) encourage college visits, (2) assist with college applications, (3) assist with financial aid applications, and (4) contact college representatives on behalf of students. To capture the normative component of the college-linking strategy, as reflected in the school’s commitment to the equitable distribution of college-related resources, I used a measure of school-initiated outreach to families regarding the college planning process. Each variable was coded dichotomously to indicate whether the school engaged in a practice “often” or “less than often.”

**Other School Characteristics** In addition to measures of college-linking strategies, the model predicting college enrollment included controls for school context and composition: average academic achievement and average SES (aggregated measures constructed using data from the full sample of students in each HSES school), student-teacher ratio, and concentration of students of color (1 = black and Latino enrollment > 40 percent); *sector*; and *urbanicity*. The association between these school-level factors and students’ outcomes, including college enrollment, has been well documented in the literature on school effects (see, e.g., Coleman and Hoffer 1987; Lee et al. 1998). The model controlled for school structures that offer students academic preparation for college using a measure of foreign language requirements (see Adelman 1999; Coleman and Hoffer 1987).
ANALYTIC METHODS

This analysis was guided by several research questions. Addressing these questions involved measuring the college-linking strategy as a multidimensional construct and estimating its effects on college enrollment in a multilevel model.

To capture the multidimensionality of the strategies, I used a latent class analysis. Latent class analysis is the categorical equivalent of cluster analysis and provides a means of empirically characterizing a multidimensional typology (Hagenaars and McCutcheon 2002; McCutcheon 1987; see also Yamaguchi 2000). As I have indicated, college-linking strategies are conceptualized in terms of two dimensions of school structure: organizational resources and practices that facilitate students’ transitions to college and (2) organizational norms regarding the equitable distribution of these resources to students and their families. The latent-class measurement model provides a way of operationalizing college-linking strategies that simultaneously takes into account the resource and normative dimensions of a high school’s strategy. I used LEM Categorical Data Analysis Software to specify the latent class model. The model is indicated by

\[
\eta_{mij} = \beta_{0j(m)} + \sum_{q=1}^{Qm} \beta_{qj(m)}x_{qij}
\]

and the school-level model:

\[
\beta_{0j(m)} = \gamma_{00(m)} + \sum_{s=1}^{S} \beta_{qs}w_{sj} + u_{0j(m)}
\]

where \(\eta_{mij}\) is the log-odds of outcome \(m\) (e.g., enrollment in a four-year college) for student \(i\) in school \(j\); \(\beta_{0j}\) is the intercept, \(x_{qij}\) is the value of the predictor \(q\) for student \(i\) in school \(j\); \(\beta_{qj(m)}\) is the coefficient for predictor \(q\) in school \(j\); \(\gamma_{00(m)}\) is the average school intercept; \(\gamma_{qs}\) is the coefficient for predictor \(q\) in school \(s\); \(w_{sj}\) is the value of the predictor \(s\) for school \(j\), including the linking strategies measures; and \(u_{0j(m)}\) is the random effect for school \(j\).

RESULTS

A Typology of College-Linking Strategies

The first question I addressed in the analysis was, “What are the strategies that schools use to facilitate the college-linking process?” The results for the latent class analysis that addressed this question are displayed in Table 1. The analysis revealed three distinctive college-linking strategies that I labeled traditional, clearinghouse, and brokering. Each strategy is represented by a latent class probability that appears in bold and a set of conditional probabilities representing each of the five indicator variables. The school sample included 188 urban and suburban high schools, and the latent class probabilities shown in Table 1 indicate that 9 percent of the schools in the sample used a traditional strategy, 25 percent used a clearinghouse strategy, and 66 percent used a brokering strategy for preparing their students to navigate the college-linking process.

As I noted previously, latent class analysis groups schools into categories on the basis of the conditional probabilities that are associated with the five indicators that are used to measure the strategies. The conditional probabilities in Column 1 reveal a traditional strategy that is characterized by limited resource.
capacity and a limited organizational commitment to facilitating access to available resources among students and their families. This profile is evidenced by the low conditional probabilities across the indicators that represent both the resource and normative dimensions of the model. Thus, this strategy is traditional in that it represents an approach to preparing students to navigate the college-linking process that is more consistent with the role that high schools traditionally played through much of the 20th century—as a link to the labor market for the majority of students and as a channel to college for a much smaller segment of the student population.

The results in Column 2 represent the clearinghouse strategy, which is characterized by a solid resource structure for college planning, as revealed in moderate to high conditional probabilities (0.64, 0.93, 0.68 and 0.71). However, the conditional probability for the normative dimension of this strategy (0.07) indicates a limited commitment to the equitable distribution of resources that help students and their parents navigate the college-linking process. I labeled this strategy a clearinghouse strategy because high schools that offer substantial resources for college planning, but assume a limited role in channeling these resources to students and families, operate primarily as a clearinghouse for resources. In these environments, access to resources is likely to depend more on students’ and parents’ initiatives, which may vary considerably according to a student’s background.

Column 3 displays the results associated with the brokering strategy. Conditional probabilities for the brokering strategy, which range from 0.86 to 1.00, indicate that it is characterized by substantial resources and a strong organizational commitment to affording students and families access to these resources. This school profile constitutes a brokering strategy because it not only reflects a substantial supply of resources that are related to college going, but its norms for facilitating access to these resources situate the school as a broker for its own resources and heighten its potential as an influential agent in the college-linking process.
The results presented in Table 1 suggest a hierarchy of school strategies that reflects different degrees of departure from the traditional approach to facilitating college transitions. Given its strong resource structure and norms for equitable access, I expected the brokering strategy to be most effective in positively influencing college enrollment irrespective of students’ racial/ethnic and SES backgrounds. I also expected to find that the clearinghouse strategy, given its substantial resource infrastructure, would be more effective in promoting college enrollment than the traditional strategy. However, the effects of clearinghouse schools would likely vary according to students’ backgrounds. I anticipated this group variation in the clearinghouse environments in light of research that has found that although disadvantaged students and families are more likely to rely on the school for resources related to educational attainment, they may be less likely to seek these resources on their own (Lareau 1987; Stanton-Salazar 2000). These relationships were considered in the models predicting college enrollment. Before I discuss these models, I present descriptive results comparing the organizational characteristics and student populations associated with each strategy.

School Characteristics and Student Populations

The descriptive results presented in Table 2 indicate that schools that use different college-linking strategies also differ in other organizational characteristics and the characteristics of students they serve. Panel A in Table 2 shows descriptive information at the school level. The results in Panel A indicate that in terms of the measures of school context and composition that have been an important focus in the school-effects literature, differences among traditional, clearinghouse, and brokering schools do not follow a consistent pattern. Brokering schools have the highest average math achievement, followed by traditional schools. In addition to having the lowest average math achievement, clearinghouse schools also have the lowest average SES. The schools that use traditional strategies have the highest proportion of high minority schools. Given that traditional strategies indicate schools that are limited both in their resources and in the normative infrastructure for promoting college enrollment, the representation of high minority schools is not surprising.

The results in Panel A also show significant differences in the distribution of strategies between sectors. Brokering and traditional strategies are more evenly distributed among public and private schools. However, the traditional category has a higher concentration of Catholic schools, whereas other private schools represent a larger proportion of the brokering schools. Clearinghouse schools, on the other hand, are overwhelmingly public. The low concentration of private schools in the clearinghouse group may account for the lower average SES and achievement of the clearinghouse group. Taken together, the results in Panel A indicate that school practices that characterize college-linking strategies are associated with other indicators of organizational inequality (e.g., the student–teacher ratio and average student achievement) that have been considered in the literature on stratification among schools.

Comparisons in Panel B of Table 2 indicate significant differences among students across all three categories. In addition to analyzing the relationship between college-linking strategies and college enrollment, I considered whether that relationship differs for students from different racial/ethnic groups. Table 2 shows that black and Latino students in the sample were more highly concentrated in the traditional schools. In fact, the proportion of Latino students in traditional schools was more than double their representation in the brokering and clearinghouse schools. These results reflect a more linear pattern of variation on measures of family SES (i.e., parental education and parental income). That is, brokering schools serve students with the highest levels of parental income and parental education, followed by clearinghouse and traditional schools. As I have indicated, although the full HSES student sample was used to construct the school-level measures reported in Panel A, the student sample for the analysis is limited to those who were in the NELS:88-94 panel sample and for
Table 2. Means and Standard Deviations for Variables in the HGLM Model

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Brokering</th>
<th>Clearinghouse</th>
<th>Traditional</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Variables Describing Schools</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unweighted sample size</td>
<td>(124)</td>
<td>(47)</td>
<td>(17)</td>
</tr>
<tr>
<td>School Background</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student-teacher ratio</td>
<td>14.94&lt;sup&gt;b,c&lt;/sup&gt; 4.26</td>
<td>15.52&lt;sup&gt;a,c&lt;/sup&gt; 3.41</td>
<td>22.08&lt;sup&gt;a,b&lt;/sup&gt; 6.98</td>
</tr>
<tr>
<td>Minority concentration</td>
<td>0.24&lt;sup&gt;c&lt;/sup&gt; 0.43</td>
<td>0.23&lt;sup&gt;c&lt;/sup&gt; 0.42</td>
<td>0.61&lt;sup&gt;a,b&lt;/sup&gt; 0.49</td>
</tr>
<tr>
<td>School SES</td>
<td>0.43&lt;sup&gt;b&lt;/sup&gt; 0.48</td>
<td>0.10&lt;sup&gt;a,c&lt;/sup&gt; 0.34</td>
<td>0.43&lt;sup&gt;b&lt;/sup&gt; 0.56</td>
</tr>
<tr>
<td>School math achievement</td>
<td>46.24&lt;sup&gt;b,c&lt;/sup&gt; 9.05</td>
<td>40.18&lt;sup&gt;a,c&lt;/sup&gt; 4.75</td>
<td>44.17&lt;sup&gt;a,b&lt;/sup&gt; 7.06</td>
</tr>
<tr>
<td>Sector and Urbanicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>0.26&lt;sup&gt;b,c&lt;/sup&gt; 0.44</td>
<td>0.18&lt;sup&gt;a&lt;/sup&gt; 0.39</td>
<td>0.15&lt;sup&gt;a&lt;/sup&gt; 0.36</td>
</tr>
<tr>
<td>Catholic</td>
<td>0.16&lt;sup&gt;b,c&lt;/sup&gt; 0.37</td>
<td>0.06&lt;sup&gt;a,c&lt;/sup&gt; 0.24</td>
<td>0.45&lt;sup&gt;a,b&lt;/sup&gt; 0.50</td>
</tr>
<tr>
<td>Other private</td>
<td>0.32&lt;sup&gt;b,c&lt;/sup&gt; 0.47</td>
<td>0.01&lt;sup&gt;a,c&lt;/sup&gt; 0.11</td>
<td>0.13&lt;sup&gt;a,b&lt;/sup&gt; 0.33</td>
</tr>
<tr>
<td>Academic Program Resource</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign language requirements</td>
<td>1.91&lt;sup&gt;b,c&lt;/sup&gt; 1.13</td>
<td>1.34&lt;sup&gt;a,c&lt;/sup&gt; 0.76</td>
<td>2.16&lt;sup&gt;a,b&lt;/sup&gt; 1.11</td>
</tr>
<tr>
<td><strong>B. Variables Describing Students</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unweighted Sample Size</td>
<td>(980)</td>
<td>(252)</td>
<td>(122)</td>
</tr>
<tr>
<td>Math achievement</td>
<td>46.61&lt;sup&gt;b,c&lt;/sup&gt; 13.95</td>
<td>42.97&lt;sup&gt;a,c&lt;/sup&gt; 13.87</td>
<td>44.87&lt;sup&gt;a,b&lt;/sup&gt; 15.38</td>
</tr>
<tr>
<td>Grade point average</td>
<td>2.94&lt;sup&gt;b,c&lt;/sup&gt; 0.65</td>
<td>2.77&lt;sup&gt;a,c&lt;/sup&gt; 0.71</td>
<td>2.95 0.72</td>
</tr>
<tr>
<td>Female</td>
<td>0.46&lt;sup&gt;b,c&lt;/sup&gt; 0.50</td>
<td>0.61&lt;sup&gt;a,c&lt;/sup&gt; 0.49</td>
<td>0.40&lt;sup&gt;a,b&lt;/sup&gt; 0.49</td>
</tr>
<tr>
<td>Asian</td>
<td>0.07&lt;sup&gt;b,c&lt;/sup&gt; 0.26</td>
<td>0.03&lt;sup&gt;a,c&lt;/sup&gt; 0.17</td>
<td>0.02&lt;sup&gt;a,b&lt;/sup&gt; 0.15</td>
</tr>
<tr>
<td>Black</td>
<td>0.18&lt;sup&gt;b,c&lt;/sup&gt; 0.38</td>
<td>0.12&lt;sup&gt;a,c&lt;/sup&gt; 0.33</td>
<td>0.20&lt;sup&gt;a,b&lt;/sup&gt; 0.40</td>
</tr>
<tr>
<td>Latino</td>
<td>0.15&lt;sup&gt;b,c&lt;/sup&gt; 0.36</td>
<td>0.13&lt;sup&gt;a,c&lt;/sup&gt; 0.33</td>
<td>0.33&lt;sup&gt;a,b&lt;/sup&gt; 0.47</td>
</tr>
<tr>
<td>Educational expectations</td>
<td>3.18&lt;sup&gt;b,c&lt;/sup&gt; 0.86</td>
<td>2.73&lt;sup&gt;a,c&lt;/sup&gt; 0.85</td>
<td>3.02&lt;sup&gt;a,b&lt;/sup&gt; 0.86</td>
</tr>
<tr>
<td>Parental education</td>
<td>2.43&lt;sup&gt;b,c&lt;/sup&gt; 1.09</td>
<td>2.02&lt;sup&gt;a,c&lt;/sup&gt; 0.83</td>
<td>1.89&lt;sup&gt;a,b&lt;/sup&gt; 0.97</td>
</tr>
<tr>
<td>Parental income</td>
<td>10.55&lt;sup&gt;b,c&lt;/sup&gt; 1.00</td>
<td>10.42&lt;sup&gt;a,c&lt;/sup&gt; 0.92</td>
<td>10.30&lt;sup&gt;a,b&lt;/sup&gt; 0.78</td>
</tr>
<tr>
<td>Family-based college planning resource (gave teen information about schools)</td>
<td>0.76&lt;sup&gt;b,c&lt;/sup&gt; 0.43</td>
<td>0.77&lt;sup&gt;a,c&lt;/sup&gt; 0.42</td>
<td>0.75&lt;sup&gt;a,b&lt;/sup&gt; 0.43</td>
</tr>
<tr>
<td>College Enrollment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not enrolled in college</td>
<td>0.32 0.47</td>
<td>0.36 0.48</td>
<td>0.40 0.49</td>
</tr>
<tr>
<td>Enrolled in a two-year college</td>
<td>0.19 0.39</td>
<td>0.23 0.41</td>
<td>0.49 0.50</td>
</tr>
<tr>
<td>Enrolled in a four-year college</td>
<td>0.49 0.50</td>
<td>0.41 0.49</td>
<td>0.11 0.31</td>
</tr>
</tbody>
</table>

<sup>a</sup> Significantly different from Brokering at .05.
<sup>b</sup> Significantly different from Clearinghouse at .05.
<sup>c</sup> Significantly different from Traditional at .05.
whom postsecondary enrollment data were available. This approach maximized the data available for addressing my questions about school strategies and college enrollment. However, it also limited the analysis to a student sample that is not fully representative of HSES schools, which may be an important limitation of this study.

The descriptive results also indicate that although the majority of students in each type of school go on to college, these strategies are associated with different patterns of college enrollment. Enrollment in a four-year college ranges from a high of 49 percent for students in brokering schools to a low of 11 percent for students in traditional schools.

Overall, these results indicate that variation among schools in their college-linking strategies extends to other organizational characteristics and to the background characteristics of students. However, the results also suggest that the strategies that were identified in the study represent a type of stratification among high schools that is distinct from school context and variation between sectors, which have been an important focus of past research that has linked school characteristics to college enrollment. Moreover, the results indicate that each strategy is associated with different patterns of college enrollment. These results highlight the need to analyze the effects of school strategies on college transitions in a multivariate model that takes into account other characteristics of high schools and their students.

**High School Strategies and College Enrollment**

The second stage of the analysis used two-level, multinomial modeling to consider how college-linking strategies are associated with college enrollment and whether the relationship between school strategies and college enrollment differs for students from different racial/ethnic and SES backgrounds. I expected to find that compared to traditional strategies, brokering and clearinghouse strategies that are both characterized by greater college planning resources would have a positive effect on college enrollment. However, I expected that brokering schools, whose normative structure reflects a greater commitment to the equitable distribution of college planning resources, would have a more universal positive effect on enrollment in two-year and four-year colleges and that these environments might offer greater benefits for black, Latino, and lower-SES students.

The results from the multinomial model predicting the effects of college-linking strategies on college enrollment are displayed in Table 3. The contrast categories for Models 1 and 2 reflect two outcomes that have been the primary concern in the literature on school effects and college transitions: college enrollment (two-year versus no enrollment) and college choice (two-year versus four-year enrollment); the results for the third contrast category (four-year college versus no enrollment) are presented in Appendix Table A2. Table 3 shows odds ratios for the school and student variables. Odd ratios greater than 1 indicate a positive association with the outcome measure, whereas values less than 1 indicate a negative association.

The results in Table 3 reveal that the college-linking strategies that were identified in the first stage of the analysis are associated with college enrollment (i.e., whether or not students enroll at all and the type of institution they attend). Model 1 shows negative effects on two-year college enrollment for both the brokering and clearinghouse strategies, indicating that students in clearinghouse and brokering schools are more likely to forgo college enrollment than they are to enroll in a two-year college. The results indicate that attending a brokering school is associated with a 71 percent decrease (odds ratio = 0.289) in the odds of enrolling in a two-year college (versus not enrolling). This finding is inconsistent with my expectation that a brokering strategy would have a more universal positive effect on college enrollment. The results in Model 1 also indicate that the clearinghouse strategy reduces the odds of two-year college enrollment (versus not enrolling) by nearly 60 percent (odds ratio = 0.413).

Model 2 shows significant positive effects on enrollment in a four-year college (versus a two-year college) for both the clearinghouse and brokering strategies. However, the results indicate a larger and more robust effect for
Table 3. Multinomial HGLM Results: Effects of College-Linking Strategies on College Enrollment

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Two-Year College (versus Not Enrolled)</th>
<th>Four-Year College (versus Two-Year College)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
</tr>
<tr>
<td></td>
<td>(Odds Ratio)</td>
<td>(Odds Ratio)</td>
</tr>
<tr>
<td><strong>Level 2: School Predictors</strong>&lt;br&gt;(n = 188)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Intercept</td>
<td>2.997*</td>
<td>0.115**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>School Background</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student-teacher ratio</td>
<td>1.070~</td>
<td>0.909**</td>
</tr>
<tr>
<td>Minority concentration</td>
<td>0.715</td>
<td>0.865</td>
</tr>
<tr>
<td>School SES</td>
<td>5.115***</td>
<td>0.235*</td>
</tr>
<tr>
<td>School math achievement</td>
<td>0.979</td>
<td>1.074*</td>
</tr>
<tr>
<td><strong>Sector and Urbanicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>1.274</td>
<td>1.660</td>
</tr>
<tr>
<td>Catholic</td>
<td>0.562</td>
<td>1.222</td>
</tr>
<tr>
<td>Other private</td>
<td>0.171***</td>
<td>5.278**</td>
</tr>
<tr>
<td><strong>Academic Program Resource</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign language requirements</td>
<td>0.949</td>
<td>0.912</td>
</tr>
<tr>
<td><strong>College-Linking Strategies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brokering</td>
<td>0.289**</td>
<td>9.434**</td>
</tr>
<tr>
<td>Clearinghouse</td>
<td>0.413*</td>
<td>7.023*</td>
</tr>
<tr>
<td></td>
<td>(reference category: Traditional)</td>
<td></td>
</tr>
<tr>
<td><strong>Level 1: Student Predictors</strong>&lt;br&gt;(n = 1,354)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math achievement</td>
<td>0.997</td>
<td>1.014</td>
</tr>
<tr>
<td>Grade point average</td>
<td>1.455*</td>
<td>2.099***</td>
</tr>
<tr>
<td>Female</td>
<td>0.835</td>
<td>1.779*</td>
</tr>
<tr>
<td>Asian</td>
<td>1.104</td>
<td>1.268</td>
</tr>
<tr>
<td>Black</td>
<td>0.655</td>
<td>2.201*</td>
</tr>
<tr>
<td>Latino</td>
<td>0.656</td>
<td>0.978</td>
</tr>
<tr>
<td>Educational expectations</td>
<td>1.278</td>
<td>1.567***</td>
</tr>
<tr>
<td>Parental education</td>
<td>0.817</td>
<td>1.264~</td>
</tr>
<tr>
<td>Parental income</td>
<td>0.882</td>
<td>1.014</td>
</tr>
<tr>
<td>Family-based college planning resources</td>
<td>0.841</td>
<td>1.355</td>
</tr>
<tr>
<td><strong>Model Statistics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>Chi-square</td>
</tr>
<tr>
<td>Two-year college (versus not enrolled)</td>
<td>0.69562</td>
<td>257.07032</td>
</tr>
<tr>
<td>Four-year college (versus two-year)</td>
<td>0.88212</td>
<td>304.18035</td>
</tr>
</tbody>
</table>

~ \(p < .10\), *\(p < .05\), **\(p < .01\), ***\(p < .001\).
the brokering strategy. Attending a clearinghouse school is associated with a 600 percent increase (odds ratio = 7.02, \( p < .05 \)) in the odds of enrolling in a four-year college (versus a two-year college), whereas the brokering strategy is associated with a more than 800 percent increase (odds ratio = 9.43, \( p < .01 \)) in the odds of enrolling in a four-year college (versus a two-year college). These results suggest that although both the clearinghouse and brokering strategies are positively associated with enrollment in a four-year college among college-bound students, brokering schools are more effective at facilitating four-year college enrollment.

At the student level, Model 1 shows no significant effects for race/ethnicity and SES. However, Model 2 indicates that black students in the sample were more likely to enroll in a four-year college. Model 2 also confirms a positive relationship between parental education and enrollment in a four-year college (compared to a two-year college). Both results are consistent with the findings of past research.

As I have pointed out, understanding how the effects of college-linking strategies may differ among students from different racial/ethnic and SES backgrounds is important, given the ways in which student populations are diversifying. However, these relationships have not been fully explored in previous research. The next section reports the results of analyses that considered group differences in the effects of college-linking strategies on college enrollment.

**Differential Effects of College-Linking Strategies**

The final question of interest in this analysis was, “To what extent does the relationship between college-linking strategies and college enrollment differ for students from different racial/ethnic and SES backgrounds?” I analyzed these relationships in models that included cross-level interactions between college-linking strategies and students’ background (i.e., parental education, parental income, black, and Latino).\(^{12}\) The results from these models revealed no significant effects for the interactions between the SES indicators and the strategies. However, the analysis did reveal significant racial/ethnic variation in the effects of the college-linking strategies.

Table 4 presents odds ratios for the interactions between racial/ethnic background and school strategy (for the results for the full models including these interactions, see Appendix Table A3). The results indicate no significant difference in the effects of the clearinghouse strategy on the likelihood that black students would enroll in a two-year college (versus not enroll at all). By contrast, the results show that for Latino students in clearinghouse schools, the odds of enrolling in two-year colleges (rather than not enrolling at all) decrease by more than 90 percent (odds ratio = 0.086439). The model comparing two-year versus four-year college enrollment shows a significant positive effect of the clearinghouse strategy for both black and Latino students, boosting the odds of four-year college enrollment 22 and 17 times, respectively. The absence of any significant effects for the interactions between the brokering strategy and students’ background suggests that schools that use that strategy are more equitable in their overall influence on the college-linking process, but contrary to my expectations, are not distinct in their effects for advantaged and disadvantaged students.

In general, the results show some racial/ethnic differences in the effects of school strategies on college enrollment. However, significant group differences emerge only for the clearinghouse strategy. In other words, whereas a brokering strategy for facilitating college transitions seems to be consistent in its effects on college enrollment irrespective of students’ racial/ethnic backgrounds, schools that pursue a clearinghouse strategy appear to have strong positive effects on black and Latino students who are choosing between types of institutions, but significant negative implications for the enrollment of Latino students who may be considering two-year college as an entry point into postsecondary education.

**DISCUSSION**

The primary goal of this study was to reconsider the relationship between high schools
and college enrollment by focusing on the strategies that schools use to facilitate transitions to college. Specifically, the study modeled the extent to which school resources and norms for helping students transition to college revealed distinctive college-linking strategies. The study also analyzed the relationship between school strategies and college enrollment and explored the extent to which that relationship varied for students from different racial/ethnic and SES groups. Overall, the findings suggest that it is meaningful and important to think about organizational variation among schools in terms of multiple strategies for facilitating the transition to college. My findings also suggest that “what schools do” to help students navigate the college-linking process (i.e., organizational practices) makes a difference for postsecondary educational outcomes. Moreover, by analyzing organizational differences among high schools, in terms of their resource capacity and organizational commitment to equity in the college-linking process, this analysis has shed new light on the relationship between high school structures and practices and postsecondary outcomes for some students of color.

The study identified three college-linking strategies: traditional, clearinghouse, and brokering. A traditional strategy provides students with limited resources that are relevant for college going and reflects little organizational commitment to facilitating students’ access to available resources. A clearinghouse strategy is reflected in schools that offer a fairly substantial structure of resources for going to college but that, like traditional schools, are weak in the area that reflects an organizational commitment to preparing students and families to navigate the college-linking process. The brokering strategy is indicated by an exceptional structure of college planning resources and norms that promote the equitable distribution of these resources to students and their families.

The results also indicate that these strategies differ in their influence on the college-linking process and that the effects of a clearinghouse strategy differ significantly among different racial/ethnic groups. Thus, although the literature has highlighted the importance of analyzing the kind of variation among schools that is captured in the three strategies and has outlined the conceptual framework for understanding how schools influence the college-linking process that guided this study, the typology of school strategies that is specified in this analysis provides evidence of the character and scope of such variation among a broad sample of schools. Moreover, the findings suggest that additional insights about links between school effects on enrollment in college and the stratification of racial/ethnic groups in postsecondary education will emerge from future research that

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Two-Year College (versus Not Enrolled)</th>
<th>Four-Year College (versus Two-Year College)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Odds Ratio)</td>
<td>(Odds Ratio)</td>
</tr>
<tr>
<td>Brokering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>1.250</td>
<td>6.301</td>
</tr>
<tr>
<td>Latino</td>
<td>0.610</td>
<td>2.013</td>
</tr>
<tr>
<td>Clearinghouse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>0.989</td>
<td>22.548*</td>
</tr>
<tr>
<td>Latino</td>
<td>0.086*</td>
<td>17.371**</td>
</tr>
</tbody>
</table>

Reference Category: Traditional

*p < .05, **p < .01.
investigates how these statuses interact with the organizational characteristics of schools.

A noteworthy finding from the descriptive comparisons of the three strategies is that although schools that use these strategies can be found in both the public and private sectors, the clearinghouse strategy is overwhelmingly a public school phenomenon. It is conceivable that the high school structure that characterizes the clearinghouse strategy and distinguishes it from the traditional and brokering strategies may have evolved as a result of efforts by public schools to respond to the growing demand for postsecondary education. In other words, at a time when fewer students expected to go to college, organizational differences among high schools may have reflected only two types of schools: those that prepared students to transition to college and those that did not. Thus, the clearinghouse strategy, which clearly provides more resources related to going to college than does the traditional strategy but lacks evidence of an institutional commitment to acting as an agent in the college-linking process for all students and families, may represent a more recent organizational configuration. Moreover, it may represent an assumption that additional resources are sufficient for helping a growing and diversifying population of college aspirants to navigate the college-linking process successfully. Some of the findings from this study challenge this assumption.

With regard to the effects of college-linking strategies on college enrollment, the findings are mixed. Although, the results provide some support for the conventional wisdom that “more is better,” at least in terms of strategies for facilitating four-year college enrollment, they also suggest that this conclusion does not characterize the association between school strategies and two-year college enrollment. The positive effect of the clearinghouse strategy in the four-year versus the two-year comparison confirms that resources are important. However, the larger, more robust, effect for the brokering strategy in the same comparison supports the conclusion that schools that make strong commitments to practices that promote equitable access to resources reflect a more effective strategy for facilitating four-year college enrollment. This general conclusion is born out in the model comparing four-year college enrollment to no enrollment (see Appendix Table A2), which shows a significant positive effect on the odds of enrolling in a four-year school for the brokering strategy and a positive effect for the clearinghouse strategy, which would likely reach significance with a larger sample. These results suggest that while resources are clearly important, there is more that schools can do to facilitate four-year college enrollment, an outcome that has long-standing positive implications for attainment and mobility in adulthood.

By contrast, the results for the two-year versus no enrollment comparison indicate that both the clearinghouse and brokering strategies are associated with a significant decrease in the odds of two-year college enrollment. This finding failed to confirm my expectation that the brokering strategy would exert a more universal positive effect on the likelihood that students would enroll in some level of postsecondary education immediately after high school—that is, controlling for other factors, that a brokering strategy would facilitate four-year college enrollment for those who were college bound and would facilitate two-year enrollment for those who were considering the choice between a two-year institution and not enrolling. These findings offer some support for the argument that the approach that schools take to prepare students to transition to college may shape “tastes” for particular types of postsecondary education (McDonough 1997). In other words, aspects of the school environments that characterize the clearinghouse and brokering strategies—in addition to providing more college-related resources than the traditional strategy—may steer students away from two-year institutions. Given the negative implications of delaying postsecondary enrollment (Bozick and DeLuca 2005; see also Dougherty 1991), these effects may not be benign for a student who is considering whether to enroll in a two-year college, rather than to delay enrolling in college.

The analysis of group differences in the association between school strategies and
college enrollment also yielded mixed results. However, it suggests that the way high schools organize themselves to facilitate students’ college transitions has implications that vary among racial/ethnic groups. The results of the analysis that explored the interaction between school strategies and students’ characteristics indicated no significant variation among SES groups in the effects of school strategies on college enrollment. These results were unexpected and may be related to the specific outcome that was examined in the analysis. It is possible that the effects of school strategies may vary among SES groups for college-bound students who are choosing among colleges with various levels of selectivity (Hearn 1984; Karen 2002; McDonough 1997). For brokering schools, the results indicate no significant variation in effects among racial/ethnic groups, which suggests that the norms for equitable access to resources that distinguish the brokering strategy allow these schools to influence the college-linking process similarly for students of all racial/ethnic backgrounds. However, the findings confirm that the effects of the clearinghouse strategy do vary to some extent by racial/ethnic group. For students who are college bound, that is, those who are choosing between two-year and four-year colleges, attending a clearinghouse school appears to increase significantly the odds of attending a four-year institution for black and Latino students.

The findings also indicate that for the two-year versus no enrollment comparison, the negative association between the clearinghouse strategy and two-year college enrollment is stronger for Latino students. In other words, the results suggest that Latino students in schools with good resource structures and limited commitment to facilitating equitable access to these resources are more likely to forgo college enrollment than to enroll in a two-year school. As I suggested, this result may reflect the negative implications of an environment with a weaker mechanism for outreach to students and families who are less inclined to seek such resources on their own (Stanton-Salazar 1997, 2000) and who may have less access to such guidance from sources outside the school. On the other hand, for college-bound students who are choosing between two-year and four-year colleges, the strong positive influence of the clearinghouse strategy on four-year college enrollment for black and Latino students suggests that this strategy for facilitating college transitions may work especially well for students who are already poised to attend college. This result, coupled with the absence of any significant racial/ethnic group differences in the interactions with the brokering strategy, supports the conclusion that high schools that lack an institutional-level commitment to facilitating college transitions equitably and actively may have the most significant implications for Latino students. These implications are associated with the fact that Latino students represent the fastest-growing segment of the school-age population, yet their rates of postsecondary enrollment continue to lag behind those of other racial/ethnic groups (NCES 2005).

The majority of high school students now go on to some form of postsecondary education (NCES 2005). Nonetheless, persistent disparities between advantaged and disadvantaged students in postsecondary educational access and outcomes indicate the importance of understanding the factors that account for this variation, particularly the factors that may be responsive to intervention. The typology revealed in this study provides evidence of a type of organizational variation among schools that did not fully emerge from studies of school effects on college enrollment and thus is noteworthy from a sociological perspective. The study also suggests the kinds of policies and practices that may help schools respond to the growing demand for college in ways that effectively address persistent inequalities between advantaged and disadvantaged students. The analysis suggests that schools that do more to ensure that they are not only well equipped to prepare students to navigate the transition to college, but that ensure that these resources find their way to students are most influential in promoting the outcomes (e.g., four-year college enrollment) that are beneficial for the attainment process. Like other studies that have followed in the wake of Coleman et al.’s (1966) research on school effects, this study did not ignore the
fact that whether or not students enroll in college and the types of institutions they attend depend a great deal on students’ decision making and a number of other factors that have been considered in research on individual-level effects. Nonetheless, this study further demonstrates that organizational differences between schools that inform what schools do to help students navigate the college-linking process have significant implications for postsecondary outcomes.

NOTES

1. The size of the student clusters within these schools ranged from 2 to 23.

2. Because I was interested in examining school effects on college enrollment, the analysis was limited to members of the HSES sample who were part of the NELS eighth-grade panel sample. Data on college matriculation from the third follow-up of NELS:88–94 were matched with HSES school data to complete the analysis. Members of the 1988–94 panel are the only members of the HSES sample for whom postsecondary data are available. For a more complete discussion of the HSES student sample, see Scott et al. (1996).

3. The proportion of missing responses on individual variables that were included in the analysis ranged from 0 to 10.9 percent prior to imputation. In all but one case, the percentage of missing values fell below 5 percent. No systematic patterns of missing responses were apparent among the items for which variables were imputed.

4. Throughout this article, I use SES to refer to parents’ education and family income that are included in the model as separate measures. For a discussion of parents’ education and its distinct effects on college enrollment, see Horn and Nuñez (2000).

5. In the analysis predicting college enrollment, measures of math achievement, parental education, student’s educational expectations, and family income were grand mean centered. The remaining student-level indicators were centered around their natural metric. Therefore, the intercept for the grand-mean-centered items is interpreted as the expected outcome for an X value equal to the grand mean. The intercept for variables centered around their natural metric are interpreted as the expected outcome when a given X value is equal to 0. For a further discussion, see Raudenbush and Bryk (2002).

6. The measure of family-based college planning resources (F2P6SD) was taken from the NELS Second Follow-up Parent Questionnaire and was matched to the HSES data.

7. The latent class indicators are derived from five items that asked school administrators the following question: “How often do staff at your school engage in the following activities, if at all. The five items were as follows: (1) “Encouraging College Visits”—the school reports encouraging seniors to visit colleges (S2C12A), (2) “Assisting with College Applications”—the school reports assisting seniors with college applications (S2C12C), (3) “Assisting with Financial Aid Applications” (S2C12D), (4) “Contacting College Representatives” (S2C12E), and (5) “Contacting Parents re: Students’ College Selection” (S2C12B).

The school administrators chose 1 of 4 responses ("never," “seldom,” “sometimes,” and “often”). The dichotomous coding of these measures for the latent class analysis collapses two and, in one case, three response categories, which results in some loss of information. However, this coding scheme is not inconsistent with the generally bimodal distribution of responses on each measure and therefore should preserve the important elements of variation in the data.

8. I used the measure of foreign language requirement as an indicator of a curricular structure with a focus on preparing students to meet academic requirements for college. High schools that offer courses that are important for college admission as part of the standard curriculum increase the range of college contexts that students are prepared to enter. Strong academic structures are also associated with greater levels of persistence to completion of a degree.

9. These analyses used school- and student-level weights. I used S1SWT3, which is one of three school-level weights in HSES. At the student level, I used the weight for the students in the HSES sample who were members of the NELS panel sample, S288PNWT.
For additional documentation on the HSES design weights, see Scott et al (1996).

10. To measure college-linking strategies among high schools and to confirm the number of categories (classes) represented in the data, I tested two-, three- and four-class models using LEM categorical data analysis software. My comparison of the BIC and classification error statistics for each model confirmed that schools were best characterized by a typology that consists of three distinct classes (for a thorough discussion of the procedure for comparing latent class models, see Vermunt and Magidson 2002). I used two techniques to confirm the stability of the three-class model. First, I examined the conditional probabilities for each of the five indicator variables which are listed as part of the latent class model output. A latent class model that consists of a substantial number of marginal probability pairs (e.g., .51 and .49) is more likely to be unstable and thus reflect an unreliable representation of categories in the data. The second approach I used to confirm the stability of the model was to introduce a set of school-level covariates into the latent class estimation. The stability of the three-class model was further confirmed by the fact that introducing the covariates did not alter defining characteristics of the high school strategies identified in the original three-class model.

11. In this analysis, conditional probabilities for each category indicate the proportion of schools in the category that regularly engaged in each of these practices. These probabilities are used to group schools into categories, as discussed in the Analytic Methods section. The conditional probabilities shown in Table 1 can be interpreted as indicators of organizational tendencies that characterize schools in each of the three categories.

12. I ran models that included each of the interactions separately, as well as a model that incorporated all the interactions. The overall results for parental income, parental education, black, and Latino were consistent in each case.
### Table A1. Description of Variables

<table>
<thead>
<tr>
<th>Name of Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>School-Level Variables</strong></td>
<td></td>
</tr>
<tr>
<td>Student-teacher ratio</td>
<td>S1SCENRL (Midpoint S1C35)</td>
</tr>
<tr>
<td>Minority concentration</td>
<td>Black and Hispanic enrollment &gt; 40 percent = 1 (S1C27d + S1C27e)</td>
</tr>
<tr>
<td>School SES</td>
<td>Mean school SES: aggregate measure of weighted student-level variable</td>
</tr>
<tr>
<td>School math achievement</td>
<td>Mean math achievement: aggregate measure of weighted student-level variable</td>
</tr>
<tr>
<td>Urban</td>
<td>G10URBAN = 1; G10CTRL1 = 2, 3, 4</td>
</tr>
<tr>
<td>Catholic, private</td>
<td>G10URBAN = 2; G10CTRL1 = 1</td>
</tr>
<tr>
<td>Foreign language requirement</td>
<td>Graduation requirements for foreign language (S1C70G)</td>
</tr>
<tr>
<td><strong>Student-Level Variables</strong></td>
<td></td>
</tr>
<tr>
<td>Mathematics achievement</td>
<td>Math IRT score (S22XMIRR)</td>
</tr>
<tr>
<td>Grade point average</td>
<td>Average of student reported grades in English, history, math, and science</td>
</tr>
<tr>
<td>Female</td>
<td>S2SEX = 2; reference group is male</td>
</tr>
<tr>
<td>Asian</td>
<td>S2RACE1 = 1; reference group is white</td>
</tr>
<tr>
<td>Black</td>
<td>S2RACE1 = 3; reference group is white</td>
</tr>
<tr>
<td>Latino</td>
<td>S2RACE1 = 2; reference group is white</td>
</tr>
<tr>
<td>Educational expectations</td>
<td>Highest level of education the student expects to attain</td>
</tr>
<tr>
<td>Parental education</td>
<td>S2PARED 1, 2 = high school or less; 3 = some college; 4 = BA; 6 = BA+</td>
</tr>
<tr>
<td>Parental income</td>
<td>S2P74: Natural log of range midpoint</td>
</tr>
<tr>
<td>Family-based college planning resource</td>
<td>F2P65D</td>
</tr>
<tr>
<td>College matriculation</td>
<td>PSE1092a</td>
</tr>
<tr>
<td></td>
<td>Not enrolled</td>
</tr>
<tr>
<td></td>
<td>Enrolled in a two-year institution</td>
</tr>
<tr>
<td></td>
<td>Enrolled in a four-year institution</td>
</tr>
</tbody>
</table>

Source: High School Effectiveness Study, National Center for Education Statistics.

Table A2. Multinomial HGLM Results: Effects of College-Linking Strategies on College Matriculation

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Coefficient</th>
<th>SE</th>
<th>Odds Ratio</th>
<th>Coefficient</th>
<th>SE</th>
<th>Odds Ratio</th>
<th>Coefficient</th>
<th>SE</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 2: School Predictors (n = 188)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Intercept</td>
<td>1.098*</td>
<td>0.474</td>
<td>2.997</td>
<td>-1.065*</td>
<td>0.605</td>
<td>0.345</td>
<td>-2.163**</td>
<td>0.712</td>
<td>0.115</td>
</tr>
<tr>
<td>School Background</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student-teacher ratio</td>
<td>0.068 ~</td>
<td>0.037</td>
<td>1.070</td>
<td>-0.028</td>
<td>0.041</td>
<td>0.973</td>
<td>-0.095**</td>
<td>0.037</td>
<td>0.909</td>
</tr>
<tr>
<td>Minority concentration</td>
<td>-0.336</td>
<td>0.423</td>
<td>0.715</td>
<td>-0.480</td>
<td>0.479</td>
<td>0.619</td>
<td>-0.145</td>
<td>0.520</td>
<td>0.865</td>
</tr>
<tr>
<td>School SES</td>
<td>1.632***</td>
<td>0.486</td>
<td>5.115</td>
<td>0.186</td>
<td>0.588</td>
<td>1.204</td>
<td>-1.446*</td>
<td>0.635</td>
<td>0.235</td>
</tr>
<tr>
<td>School math achievement</td>
<td>-0.021</td>
<td>0.032</td>
<td>0.979</td>
<td>0.050</td>
<td>0.038</td>
<td>1.052</td>
<td>0.071*</td>
<td>0.036</td>
<td>1.074</td>
</tr>
<tr>
<td>Sector and Urbanicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>0.243</td>
<td>0.408</td>
<td>1.274</td>
<td>0.749</td>
<td>0.570</td>
<td>2.116</td>
<td>0.507</td>
<td>0.508</td>
<td>1.660</td>
</tr>
<tr>
<td>Catholic</td>
<td>-0.576</td>
<td>0.744</td>
<td>0.562</td>
<td>-0.376</td>
<td>1.130</td>
<td>0.686</td>
<td>0.200</td>
<td>0.685</td>
<td>1.222</td>
</tr>
<tr>
<td>Other Private</td>
<td>-1.764**</td>
<td>0.560</td>
<td>0.171</td>
<td>-0.101</td>
<td>0.445</td>
<td>0.904</td>
<td>1.664**</td>
<td>0.573</td>
<td>5.278</td>
</tr>
<tr>
<td>Academic Program Resource</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign language</td>
<td>-0.052</td>
<td>0.134</td>
<td>0.949</td>
<td>-0.144</td>
<td>0.163</td>
<td>0.866</td>
<td>-0.092</td>
<td>0.130</td>
<td>0.912</td>
</tr>
<tr>
<td>College-Linking Strategies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brokering</td>
<td>-1.242**</td>
<td>0.408</td>
<td>0.289</td>
<td>1.002~</td>
<td>0.584</td>
<td>2.724</td>
<td>2.244**</td>
<td>0.621</td>
<td>9.434</td>
</tr>
<tr>
<td>Clearinghouse</td>
<td>-0.883*</td>
<td>0.402</td>
<td>0.413</td>
<td>1.066</td>
<td>0.683</td>
<td>2.904</td>
<td>1.949*</td>
<td>0.720</td>
<td>7.023</td>
</tr>
</tbody>
</table>

(reference category: Traditional)
<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Two-Year College (versus Not Enrolled)</th>
<th>Four-Year College (versus Not Enrolled)</th>
<th>Four-Year College (versus Two-Year College)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math achievement</td>
<td>-0.003 (0.017)</td>
<td>0.011* (0.011)</td>
<td>0.014 (0.019)</td>
</tr>
<tr>
<td>Grade point average</td>
<td>0.375* (0.173)</td>
<td>1.116*** (0.271)</td>
<td>0.741*** (0.201)</td>
</tr>
<tr>
<td>Female</td>
<td>-0.180 (0.223)</td>
<td>0.396 (0.193)</td>
<td>0.576* (0.263)</td>
</tr>
<tr>
<td>Asian</td>
<td>0.099 (0.353)</td>
<td>0.337 (0.362)</td>
<td>0.238 (0.303)</td>
</tr>
<tr>
<td>Black</td>
<td>-0.423 (0.455)</td>
<td>0.366 (0.434)</td>
<td>0.789* (0.389)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>-0.421 (0.345)</td>
<td>-0.444 (0.334)</td>
<td>-0.022 (0.364)</td>
</tr>
<tr>
<td>Educational expectations</td>
<td>0.245~ (0.137)</td>
<td>0.694*** (0.204)</td>
<td>0.449** (0.181)</td>
</tr>
<tr>
<td>Parent education</td>
<td>-0.202 (0.145)</td>
<td>0.033 (0.152)</td>
<td>0.235~ (0.136)</td>
</tr>
<tr>
<td>Parent income</td>
<td>-0.126 (0.108)</td>
<td>-0.112 (0.136)</td>
<td>0.014 (0.137)</td>
</tr>
<tr>
<td>Family-based college planning resource (gave teen</td>
<td>-0.173 (0.275)</td>
<td>0.131 (0.239)</td>
<td>0.304 (0.261)</td>
</tr>
<tr>
<td>information about schools)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model Statistics

<table>
<thead>
<tr>
<th>Model Statistics</th>
<th>SD</th>
<th>Variance Component</th>
<th>df</th>
<th>Chi-square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-year college (versus not enrolled)</td>
<td>0.69562</td>
<td>0.48389</td>
<td>177</td>
<td>257.07032</td>
<td>0.000</td>
</tr>
<tr>
<td>Four-year college (versus not enrolled)</td>
<td>0.77819</td>
<td>0.60558</td>
<td>177</td>
<td>254.12612</td>
<td>0.000</td>
</tr>
<tr>
<td>Four-year college (versus two-year college)</td>
<td>0.88212</td>
<td>0.77814</td>
<td>177</td>
<td>304.18035</td>
<td>0.000</td>
</tr>
</tbody>
</table>

~ p < .10, *p < .05, **p < .01, ***p < .001.
Table A3. Multinomial HGLM Results with Cross-Level Interactions: Effects of College-Linking Strategies on College Enrollment

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Two-Year College (versus Not Enrolled)</th>
<th>Four-Year College (versus Two-Year College)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1 (Odds Ratio)</td>
<td>Model 2 (Odds Ratio)</td>
</tr>
</tbody>
</table>
| **Level 2: School Predictors**  
(n = 188) | | |
| Average intercept | 2.491* | 0.153* |
| School Background | | |
| Student-teacher ratio | 1.066~ | 0.913* |
| Minority concentration | 0.617 | 0.992 |
| School SES | 4.799** | 0.243* |
| School math achievement | 0.982 | 1.068~ |
| Sector and urbanicity | | |
| Urban | 1.290 | 1.731 |
| Catholic | 0.512 | 1.189 |
| Other private | 0.188** | 4.757** |
| Academic Program Resource | | |
| Foreign language requirements | 0.932 | 0.929 |
| College-Linking Strategies | | |
| Brokering | 0.325** | 7.707** |
| Clearinghouse | 0.565 | 4.010~ |
| (reference category: Traditional) | | |
| **Level 1: Student Predictors**  
(n = 1,354) | | |
| Math achievement | 0.998 | 1.015 |
| Grade point average | 1.392* | 2.189*** |
| Female | 0.847 | 1.824 |
| Asian | 1.109 | 1.240 |
| Black | 0.645 | 0.243 |
| Latino | 1.642 | 0.298 |
| Educational expectations | 1.296* | 1.547** |
| Parental education | 0.811 | 1.279~ |
| Parental income | 0.870 | 1.013 |
| Family-based college planning resource | 0.852 | 1.358 |
| Cross-Level Interactions | | |
| Brokering * Black | 1.250 | 6.301 |
| Brokering * Latino | 0.610 | 2.013 |
| Clearinghouse * Black | 0.989 | 22.548* |
| Clearinghouse * Latino | 0.086* | 17.371** |

**Model Statistics**

<table>
<thead>
<tr>
<th></th>
<th>SD</th>
<th>Chi-square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-year college (versus not enrolled)</td>
<td>0.71832</td>
<td>258.64402</td>
<td>0.000</td>
</tr>
<tr>
<td>Four-year college (versus two-year college)</td>
<td>0.91308</td>
<td>317.09256</td>
<td>0.000</td>
</tr>
</tbody>
</table>

~ p < .10, *p < .05, **p < .01, ***p < .001.
REFERENCES


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