THE IMPACT OF HISTORICALLY BLACK COLLEGES AND UNIVERSITIES ON THE ACADEMIC SUCCESS OF AFRICAN-AMERICAN STUDENTS☆

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Anchored in national longitudinal data analyzed through hierarchical linear and non-linear modeling, this study found that African-American students have a similar probability of obtaining a BA degree whether they attended a historically Black college or university (HBCU) or a historically White college or university (HWCU). Among African-Americans, females are more likely to obtain a baccalaureate degree than males. Especially given that HBCUs are significantly underfunded relative to HWCUs, the findings of this study lend support to the proposition that HBCUs contribute significantly to higher education in this country and merit strong support from both the public and private sectors.

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KEY WORDS: Historically Black Colleges; African-American students; degree completion; college impact; hierarchical non-linear modeling.

Until the midpoint of the 20th century, more than 90% of the African-American students enrolled in higher education in this country were educated in Historically Black Colleges and Universities (HBCUs). However, since the early 1960s, in part because of public pressures to desegregate higher education, the percentage of African-American college-going students at HBCUs has dramatically declined—with only 17% of Black students enrolling in the 103 HBCUs in this country (National Center

for Education Statistics [NCES], 1996). Yet, about 30% of the BA degrees awarded to African-Americans annually are produced by the 89 four-year (41 public and 48 private) HBCUs (NCES, 1996, 2003). Among African-American college graduates, a disproportionately high percentage of political leaders, lawyers, doctors, and Ph.D. recipients have graduated from HBCUs (Gray, 1998; Jackson, 2002; Willie and Edmonds, 1978; Wolf-Wendel, Baker, and Morphew, 2000).

Notwithstanding HBCUs' historic contribution to educational opportunities for African-Americans, questions continue to be raised about their educational quality and value. In the 1992 case of *United States* v. *Fordice*, the U.S. Supreme Court raised questions regarding the educational quality and value of HBCUs. The legitimacy of HBCUs has also been called into question by, among others, policymakers in states such as Mississippi, who have called for mergers between HBCUs and HWCUs (Historically White Colleges and Universities) and, in some instances, the closure of HBCUs. Moreover, some African-American students and their parents, along with other constituencies, have expressed concerns about the relative value of attending an HBCU as opposed to an HWCU.

Degree completion is often used by policymakers as well as students and their families in making public and private decisions about HBCUs. Completing a baccalaureate degree is not only considered an indicator of academic success, but also a vehicle to professional advancement and a symbol of membership in the American middle class (Beeghley, 1989). Among minority students in particular, college degree completion is a highly valued goal, especially because it is often viewed as the only hope and means for upward social mobility (Bowles and Gintis, 1976; Collins, 1979). Nested within this context, the purpose of this study was to examine the impact of HBCUs on the academic success—as reflected in degree completion—of African-American students.

LITERATURE ON HBCUs: COMPARISONS WITH HWCUs

There is a growing literature comparing HBCUs with HWCUs. As a foundation for this study, we look briefly at major student demographic characteristics as well as institutional characteristics of HBCUs. We then examine the literature on the major areas of impact examined in our study: academic success and degree completion.

Student Demographics and Institutional Characteristics of HBCUs

The literature on Black college students suggests that those matriculating at HBCU campuses tend to have backgrounds different from

those at HWCUs. Though African-Americans score far below their White counterparts on undergraduate admission tests even after controlling for family income and parental level of education (Nettles and Perna, 1997), Black students at HBCUs tend to have even lower high school GPAs and SAT scores compared with Black students attending HWCUs (Allen, 1992; Gurin and Epps, 1975; Kim, 2002a; Nettles, 1988) and with all students nationally (McDonough, Antonio, and Trent, 1997). Black students attending HBCUs also tend to come from families lower on the socioeconomic scale than those of their peers at White institutions (Allen, 1992; Allen and Farley, 1986; Kim, 2002a), and they are likely to be younger and unmarried (Wenglinsky, 1996).

A limited number of studies have also reported on major differences in institutional resources and characteristics between HBCUs and HWCUs. Just as HWCUs traditionally enroll more affluent students than HBCUs, their resources are greater as well. The quality of the faculty, facilities, available academic programs, and opportunities for advanced study is often poorer at HBCUs (Allen, Epps, and Haniff, 1991; Thomas, 1981). Still, while most African-American students adjust successfully at HWCUs and the schools' resources are likely superior to those of HBCUs, they are less likely to feel that their institution has responded to their needs (Allen, 1992; Hemmons, 1982).

HBCUs, on the other hand, seem to make up for what they lack in resources by providing a more collegial and supportive learning environment for students and faculty. Retention studies of students at all institutions (e.g., Nagda, Gregerman, Jonides, Hippel, and Lerner, 1998; Pascarella and Terenzini, 1979; Terenzini and Pascarella, 1980) have shown that the frequency of student--faculty contact is positively related to students' academic growth. Nagda et al. (1998) found that student--faculty research partnerships positively affect students' persistence at the University of Michigan. Their research reported that the effect was strongest for African-American students—especially sophomores. Studies by Ellis (1988) and LaVant, Anderson, and Tiggs (1997) also reported the benefits that Black students at both HBCUs and HWCUs receive from faculty mentoring. More research is needed, however, to determine if involvement in faculty research is more likely to make a student graduate from an HBCU. In studies specifically relating to Black students, Allen (1992) suggests that academic achievement is highest for students—at both types of institutions—who have, among other things, positive relationships with faculty. Allen (1992), Ross (1998), and Wells-Lawson (1994) reported that Black students have more frequent, and meaningful, interaction with both Black and White faculty at HBCUs than at HWCUs, whereas Wenglinsky (1996) found no

significant difference in student–faculty interaction between students at HBCUs and those at HWCUs. Kim (2004, p. 120) also stated that Black students at HBCUs are "more actively and deeply involved in the academic community" than Blacks at HWCUs.

Impact of HBCUs on Students' Academic Success and Degree Completion

Currently, research regarding the impact of attending HBCUs vs. HWCUs on students' academic success is limited, and the little research there is has produced mixed results. Studies by Bohr, Pascarella, Nora, and Terenzini (1995), Centra, Linn, and Parry (1970), and Kim (2002a) found no significant differences in cognitive and academic abilities associated with attendance at either type of college. Using a national data set, Kim (2002a) found that no significant difference existed between HBCUs and HWCUs in their ability to influence overall academic ability, writing ability, and mathematics ability. Fleming (1982, 1984) reported greater cognitive growth, especially among African-American female students in HBCUs. Pascarella, Edison, Nora, Hagedorn, and Terenzini (1996) reported that HBCU students do as well as or better than their counterparts at HWCUs on standardized measures of writing skills and science reasoning. Other studies have also shown that Blacks at HBCUs receive higher grades (Allen, 1987; Allen and Wallace, 1988; Anderson, 1984; Fleming, 1984; Wenglinsky, 1996) and have higher degree aspirations (Heath, 1992) than their counterparts at HWCUs.

In terms of retention and graduation from college, Cross and Astin (1981) and Pascarella, Smart, Ethington, and Nettles (1987) reported that attending an HBCU is positively associated with students' remaining in college and earning a bachelor's degree. Using data from the National Longitudinal Study of the High School Class of 1972, Ehrenberg and Rothstein (1993) also found that Black students who attended HBCUs were more likely than Black students at HWCUs to receive a bachelor's degree. Numerous other studies on HBCUs have merely cited the positive finding of these few studies.

While the extant research has contributed to our understanding of the impact of HBCUs on African-American students, the literature is limited in several major ways. For one, there has been very little research on the impact of HBCUs on what is arguably one of the most important domains—academic success as reflected in BA degree completion by African-Americans. For another, existing research has ignored potentially confounding factors that may influence student outcomes. In particular, while most studies estimating the effects of HBCUs have

controlled for academic preparation, many have ignored other background factors such as respondents' gender and socioeconomic status of parents, as well as institutional factors such as selectivity and enrollment size—factors that may also influence student development during college. Moreover, we used a non-linear multilevel modeling technique rather than a single-level OLS regression analysis because the data are hierarchically nested (students in a college) and explaining institutional effect on student graduation involves handling a dichotomous (non-linear) variable.

THEORIES OF DEGREE COMPLETION

As an anchor point for the study, we briefly examine theories related to student degree completion and how our study is informed by the strengths and limitations of these theories.

Tinto's departure theory (1975, 1987) is clearly the most frequently cited and debated framework guiding research on dropout and retention, even though many other researchers have studied the topic for the last three decades (e.g., Astin, 1975; Bean and Metzner, 1985; Braxton, 2000; Braxton and Lien, 2000; Pascarella, Smart, and Stoeker, 1989; Spady, 1970; St. John, Cabrera, Nora, and Asker, 2000; Tierney, 1992). We reflected on Tinto's departure theory because we believe that the predictors for departure, or dropout, may be closely related to those for graduation. Simply, if we succeed in retaining students, they will eventually obtain their degrees. The core of Tinto's theory is that academic and social integration, along with goal commitment (before and after exposure to the college academic and social environment), have a significant influence on students' decision to leave college. Tinto's theoretical model (1975) advances the notion that the dropout decision or consequence is based on the interaction among students' demographic and background characteristics, goal commitment, academic system (academic integration), and the social system (social integration).

Notwithstanding its contribution, Tinto's integration theory was based on traditional college students (Bean and Metzner, 1985) and serves for an ethnic and cultural majority population rather than for minority students (Tierney, 1992). African-American students may differ from traditional White students in some important ways. Moreover, Tinto's theoretical concept did not take into account students' financial considerations—which other researchers have subsequently identified as a major explanation for student dropout—and, in turn, failure to complete their degrees, especially among students from low-income families or non-traditional college-age populations (Bean and Metzner,

1985; Braxton, 2000; St. John et al., 2000). This study considered the important components of Tinto's model—such as an initial degree goal, socioeconomic indicators, and academic and social environment, but we did not model degree completion as suggested by theorists in this tradition (e.g., eliminating the role of integration in degree completion).

Tinto's notion of integration was superseded with the concept of "student" involvement that was developed by Astin (1984). According to Astin (1984, 1991), involvement theory was originated from retention and persistence efforts. Based on his long-term large data analysis (the same data source as this study), Astin found that student involvement in campus activities directly affects students' learning outcomes and attachment to school and peer. According to Astin (1991, p. 134), "Student involvement refers to the amount of physical and psychological energy that the students devote" to the general and specific school experience. Astin (1984) notes that the amount of student learning and development associated with any educational program is directly correlated with the quality and quantity of student involvement in the program. Kuh's "seamless learning environment" and "engagement" concepts (Kuh, 1993) are similar to Astin's involvement theory. Both Astin and Kuh emphasize building educational learning structures beyond classrooms, making students more involved in and attached to educational settings and bridging classroom and out-of-classroom experiences. It is important to note that this study did not explore individual students' involvement and integration patterns owing to data limitation, but the analysis of institutional internal college characteristics variables in the hierarchical non-linear model may support the notion of involvement or engagement theory. (See the discussion section.)

Finally, Kim's institutional effectiveness model (1995, 2001) also provides a conceptual and methodological framework for this study to examine whether there is a differential effect from attending an HBCU vs. an HWCU in terms of the outcome of degree completion. Through her dissertation research, Kim (1995) expanded Astin's input-environment-outcome model to study the institutional effectiveness of women-only colleges on various intellectual and ethical outcomes. Applying a multi-level modeling perspective, Kim not only attempted to systematically distinguish global college characteristics from internal college characteristics, but also emphasized the simultaneous influence of college-level culture, structure, and opportunities and individual-level activities and experiences. The combined design of the institutional effectiveness model and multi-level modeling was also used to examine the effectiveness of Catholic schools and HBCUs on student development (Kim, 2002a; Kim and Placier, 2004). We demonstrate Kim's institutional

effectiveness model further in the methods section, where we present our strategies for the hierarchical non-linear modeling.

RESEARCH OBJECTIVES AND HYPOTHESES

In light of the shortcomings of the existing literature, along with the significance of the issue to policymakers, prospective students, and their parents, the objective of this study was to examine the effects of HBCUs on the academic success of African-American students and, in turn, the institutional factors in HBCUs that may contribute to and militate against the effects being investigated. In exploring the impact of HBCUs on the touchstone, we compare HBCUs with HWCUs as the natural frame of reference. First, we examine comparative student and institutional characteristics of HBCUs and HWCUs. Second, we examine whether HBCUs have a differential impact on obtaining a baccalaureate degree for African-American students. We also examine the difference between male and female students in the probability of obtaining a baccalaureate degree. To discern the effects of attending HBCUs vs. HWCUs, we examined the following null hypothesis: There is no differential institutional effect between HBCUs and HWCUs in terms of African-American students' probability of obtaining a bachelor's degree. Finally, we explored whether any internal college characteristics can explain the differential effect of attending an HBCU vs. an HWCU and advance educational implications for policy and practice.

METHODS

Data Source and Subjects

To achieve the objectives of this study, we obtained a national longitudinal student data set from the Cooperative Institutional Research Program (CIRP). CIRP, which is sponsored by the American Council on Education and the Higher Education Research Institute (HERI) at the University of California, Los Angeles, has conducted the largest longitudinal surveys of college students nationwide since 1966. The subjects used in this study were 941 African-American freshmen who responded to both an initial survey in the fall of 1985 and a follow-up survey taken nine years later during the summer of 1994. HERI made a special effort to trace students by Social Security numbers for the nine-year follow-up. Notably, our data demonstrate degree completion rates of African-American students who first enrolled in HBCUs or HWCUs.

Because African-American students tend to take considerably longer to graduate than White students (Kim, Rhoades, and Woodard, 2003)

and only 35% of four-year college students complete their baccalaureate degrees within four years (American Council on Education, 2002, p. 28), it was decided to use nine-year follow-up data in this study. Along with the students who did not respond to the follow-up survey and were therefore eliminated from the sample, we removed those colleges with four or fewer responding students to avoid a situation whereby only a few students would contribute to the creation of institutional means for the multi-level analysis used in the study. After cleaning the data, we compared the descriptive statistics of all variables between the original and new data; little difference was observed except for the number of HWCUs. The missing cases across the variables were small, under 3% of the total initial data.

The final sample included 401 students in 10 HBCUs and 540 students in 34 HWCUs. Among the 10 HBCUs, two were under public control; among the 34 HWCUs, 19 institutions were under public control. According to the National Center for Education Statistics (NCES) (2003), a higher proportion of HBCUs were under private control. The data set consisted of only three single-sex colleges: one White women's college, one Black women's college, and one Black men's college. Thus, we decided not to include single-sex college status in HNLMs.

Data Comparability

The gender distribution of respondents in both the HBCUs and HWCUs is broadly similar (about 64% of students were female): 197 males and 343 females in HWCUs, and 144 males and 257 females in HBCUs. While the female response rate to the surveys was higher than for males in general, the subject ratio in the sample is close to the actual ratio of college graduates between African-American male and female populations (NCES, 2003). Of 227,000 black students at HBCUs, 61% were female and the ratio of gender distribution was about the same between public and private HBCUs (NCES, 2003).

The average SAT combined scores of the African-American respondent in the data suggest a great gap between the two types of institutions: 925 for Blacks in HWCUs vs. 736 for Blacks in HBCUs. The overall respondents' SAT combined scores (846) are not much different from the national means for African-Americans. Mean SAT scores for African-American students are generally much lower than those of white students: For example, in 1986/87, the average SAT score for Blacks was 839 compared with 1038 for Whites (in 1995/1996, 856 for Blacks vs. 1049 for Whites).

Variables

Dependent Variables

The outcome variable was respondents' BA degree completion (graduation status). Students' degree completion was measured in 1989 and 1994; the information measured in 1989 was later integrated into the 1994 data. Degree completion is a dichotomous variable coded as $0 =$ not completed and $1 =$ completed. The coding schemes for variables are listed in the Appendix, and the means and standard deviations, separated by the type of institution (HBCU and HWCU), are presented in Table 1.

Independent Variables

Two kinds of independent variables were included in two-level analyses: individual-level and institution-level predictors. Individual-level predictors include high school GPA, SAT scores, age, initial degree aspiration, gender, and family socioeconomic status (parental income and mother's education). We included these variables because these student background characteristics and indicators of academic preparation have shown to influence students' college choice, college experiences, and educational success. In the individual-level modeling procedure, all individual-level variables were centered around their grand means in order to control for differences in student composition among institutions.

Institution-level predictors consisted of Black college status (vs. White college status), selectivity (mean SAT scores), public vs. private college status, and student enrollment, as well as other internal college characteristics. We decided not to include single-sex college status not only because of the limited number of single-sex colleges in the data, but also because of its statistical insignificance (close to a zero effect). The internal college characteristics variables were included to explore the association between HBCUs and internal characteristics, as well as the causal relationship between the dependent variable and internal characteristics such as expenditure, faculty, curriculum, and peer factors used in the study. We included percentage of total instruction-related expenditure and instruction-related expenditure per full-time-equivalent (FTE) student. Moreover, we considered instruction-related expenditure variables because one of the major differences between HBCUs and HWCUs is their academic resource availability and because instruction-related expenditure measures can be related to students' academic success and degree completion (Allen et al., 1991; Kim, 2002a). Relatedly, Wolf-Wendel et al. (2000) reported that instructional expenditure per student

TABLE 1. Means, Standard Deviations, and Correlation Coefficients of the Variables

Variable list	HWCU Means	HWCU SD	HBCU Means	HBCU SD	r with Black college[a]
Individual-level variables					
Dependent variable					
Degree completion	0.63	0.48	0.55	0.50	−0.08
Independent variables					
Age	3.03	0.57	3.10	0.56	0.06
Female (gender)	0.64	0.48	0.64	0.48	0.01
Degree aspiration	0.33	0.47	0.33	0.47	0.00
Parental income	6.96	3.28	6.25	3.21	−0.11*
Mother's education	4.91	1.96	4.82	2.12	−0.02
SAT	925.25	190.24	735.64	159.50	−0.48*
High school GPA	5.55	1.67	4.56	1.69	−0.29*
College GPA[b]	3.67	0.95	3.79	1.04	0.06
Institutional-level variables					
Global characteristics					
Selectivity in admission	1105.00	120.63	724.80	77.32	−0.73*
Total enrollment	14486.94	10864.51	1823.40	1002.92	−0.67*
Private college status	0.44	0.50	0.80	0.42	0.30*
Single-sex college	0.03	0.17	0.20	0.42	0.28
Black college					

Internal characteristics					
Student–faculty ratio	20.88	5.76	15.80	2.78	−0.42*
Percentage: female faculty	26.48	7.76	40.06	12.69	0.55*
Percentage: research project with faculty	22.96	7.23	31.89	5.77	0.50*
Student–faculty interaction	7.92	0.18	8.06	0.16	0.27*
Curriculum: freshman core	1.15	0.50	1.67	0.94	0.36*
Curriculum: freshman seminar	1.24	0.61	1.00	0.00	−0.19*
Curriculum: senior seminar	1.15	0.50	1.00	0.00	−0.15*
Average faculty salary	42751.94	6579.04	26814.00	5470.87	−0.68*
Percentage: faculty with a Ph.D.	84.53	6.19	62.80	12.20	−0.68*
Percentage: total	73.13	11.61	72.35	8.80	−0.03
Instruction-related expenditure					
Instruction-related expenditure per FTE student	9246	5306	6506	1208	−0.25*
Percentage: students transferring	12.25	7.48	15.71	6.41	0.22*
Percentage: undergraduate receiving aid	53.53	13.18	84.00	11.10	0.67*

Note: [a]The correlation coefficients are Spearman's rho; *$p < 0.05$ (two-tailed).
[b]College GPA was not used in the HLM/HNLM analyses. The information of the variable was much reduced, and the available samples of college GPA for mean, SD, and correlation analyses were only 280.

had a positive effect on the doctoral productivity rate among white women.

We included a faculty variable—research project with faculty—because we reasoned that working with faculty in research may help not only in promoting students' intellectual development but also in their involvement in and attachment to the college (Nagda et al., 1998), which in turn will positively influence students' degree completion. We chose the course status of curriculum offerings in freshman core course, freshman seminar, and senior seminar because they may help with students' stress reduction, integration among courses, and academic success at the beginning or end of their college years.

Other internal college characteristics (such as student–faculty interaction) were also considered in building hierarchical non-linear models (HNLM) because the literature (Astin, 1993; Pascarella and Terenzini, 1991) and common sense suggest them as potentially important factors in student development. Several of the variables considered were eventually removed because of a strong correlation with other variables in the models, their insignificant contribution to the models, and our decision to limit the number of predictors for an optimal HLM/HNLM modeling strategy (suggested by Bryk and Raudenbush, 1992; Heck and Thomas, 2000; Raudenbush and Bryk, 2002).

Method of Analysis

In a preliminary analysis, means, percentages, standard deviations, correlation, t-tests, and cross-tabulations were examined to discover similarities and differences between the characteristics of HBCUs and HWCUs. In Table 1, we present means, percentages, standard deviations, and Spearman's correlation (rho) (the latter because many of the variables were ordinal or categorical variables). To address the principal questions of this study, we used a hierarchical linear and non-linear model program (a multi-level statistical technique): we used HNLM to test the major hypothesis and to examine the relationship of individual- and institution-level variables (the combination of dichotomous, ordinal, and continuous variables) to respondents' graduation (or baccalaureate degree completion). In the HNLM models, we used a Bernoulli model (which requires 0 or 1 coding for the outcome measure) among the non-linear multilevel model options because degree completion has only two values, completed vs. not completed. HLM or HNLM has well-established methodological advantages over standard regression techniques for evaluating the effectiveness of schools and colleges and handling multi-level nested data sets (Bryk and Raudenbush, 1992; Burstein,

1980; Ethington, 1997; Raudenbush and Bryk, 2002). Yet another important advantage of the HLM or HNLM program is that it gives more weight to colleges that have more students (subjects) and less weight to institutions with fewer students or less precise data (Bryk and Raudenbush, 1992; Kim, 2002b, p. 478). We also chose robust estimation because it gives somewhat less weight to the extreme cases, or outliers, when the sample size of colleges varies.

The conceptual and methodological basis of HNLM models was anchored in Kim's institutional effectiveness model (developed from Astin's input-environment-outcome model, see Kim, 1995, 2001, 2002b). Along with the related literature review and theories of degree completion (Tinto's and Astin's models), the combination of the research capacity of HNLM and the institutional effectiveness model guided the selection of variables, statistical modeling, and the analyses of this study. Table 2 present the results of three kinds of models: student model, global model, and full model.

The student-level model incorporates personal qualities that students bring initially to their undergraduate program. The student-level model consists only of individual students' characteristics or their family background; it does not include school-level predictors. Students' influential pre-collegiate characteristics were screened before building the global and full models because it was important to hold the effects of individual background characteristics constant in order to examine Black college effect. For the student models, HNLM was grand-mean centered, while institution-level variables were not centered. That is, the intercept term for each college provides an adjusted degree completion rate, assuming the college enrolled students with mean values on all the student-level variables for the entire sample (see Raudenbush and Bryk, 2002).

Grand-mean centering equalizes institution-level units on each predictor at the individual level; in other words, institutions are adjusted for the differences of students on each individual-level predictor (for the equalization effect, see Bryk and Raudensbush, 1992; Heck and Thomas, 2000, pp. 68–69). In the individual-level models, there tends to be little variation in college slopes; hence, they were treated as non-varying (or fixed). Because of the equalization effects, we did not have to build both individual and institution models symmetrically (as in the group-mean-centering case) nor did we have to crowd the HNLM models with many similar variables (Raudenbush and Bryk, 2002). In addition, we needed to restrict the number of institution-level variables in consideration of the ratio between the number of institution-level variables and the number of sampled institutions (Heck and Thomas, 2000; Raudenbush and Bryk, 2002).

TABLE 2. Degree Completion as Dependent Variable

Independent variables	Student model		Global college model		Full model	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Institution-level variables						
Intercept	0.557	3.149***	3.117	1.459	4.718	1.815
Global college characteristics						
Black college			−1.073	−1.478	−2.255	−2.433
Private college			−0.155	−0.292	−0.265	−0.692
Mean SAT[a]			0.003	0.021	−0.282	−1.309
Enrollment[a]			−0.007	−1.834*	−0.008	−2.528**
Internal college characteristics						
Instructional expenditure/FTE					0.006	1.236
Research project with faculty					0.045	1.977*
Curriculum: senior seminar					1.290	3.962***
Individual-level variables						
Female	0.440	2.052**	0.496	2.060**	0.493	2.008**
High school GPA	0.233	3.574***	0.244	3.424***	0.250	3.583***
SAT	0.167	2.515**	0.162	2.203**	0.143	2.046**
Mother's education	0.072	1.978**	0.073	1.763*	0.083	1.952*
Degree aspiration	0.200	1.293	0.183	1.113	0.183	1.071

Note: *$p \leq 0.10$; **$p \leq 0.05$; ***$p \leq 0.01$.

[a]Mean SAT, Enrollment, instructional expenditure, and SAT were divided by 100.

The coefficients represent the odds-ratios of degree completion.

The global models include all the variables of student models and college global characteristics. According to Kim (2001), the global characteristics are institutional structural characteristics that are difficult for college administrators or program developers to change or manipulate but may be alterable in the long run (e.g., Black college, selectivity, size).

The full model consists of all the global model variables plus internal institutional characteristics. Internal college characteristics are not easily distinguishable to outsiders yet are mutable and observable to students and faculty during their involvement within the college community (e.g., curriculum, faculty and student characteristics) (Kim, 2001). The purpose of the full models is to explore why there is an institutional effect (if there is) and to identify internal institutional characteristics that may explain students' degree completion.

The distinction between the global and full models not only provides conceptual clarity in organizing the environmental characteristics, but also has a methodological advantage in identifying the point at which a study's hypothesis should be tested. The effect of HBCUs is evaluated after controlling for all other significant global college characteristics but before including the colleges' internal characteristics. The major hypothesis was tested at the 0.05 alpha level.

In building the HNLM models, we chose to include the variables of individual and institution levels for theoretical and practical modeling reasons. We decided to retain some variables regardless of their significance level; for example, initial degree aspiration for the degree completion model and an indicator of family socioeconomic status were included at the individual level, and institution size, Black college, institutional control, and selectivity in admission were included at the institution level. Unless previous studies, along with our educated common sense, indicated that we should control for the particular variables, we retained the student and college (especially in the full model) characteristics variables that were significant at the 0.10 level and then re-estimated the model. The model building was like a step-up procedure; all the chosen variables in the previous models were retained for the more complex models. The similar modeling technique was used by several researchers studying Catholic vs. public schools, women's colleges vs. coeducational colleges, school dropout rates, and student development (e.g., Bryk and Thum, 1989; Kim, 2001, 2002b; Lee and Bryk, 1989; Rumberger, 1995). This technique also helps to address the ratio issue between sample cases and variables in HLM or HNLM (see Bryk and Raudenbush, 1992; Heck and Thomas, 2000; Raudenbush and Bryk, 2002). For more information about HNLM, see Raudenbush and Bryk (2002, ch.10).

RESULTS AND IMPLICATIONS

Comparative Student and Institutional Characteristics of Black and White Institutions

Before conducting HLM and HNLM analyses, we examined student and institutional characteristics of HBCUs and HWCUs using *t*-tests, correlation analysis, and other descriptive statistics. Table 1 presents means, standard deviations, and correlation coefficients of the important variables considered in HLM and HNLM analyses. Spearman's correlation coefficients with HBCUs were presented for reference to help readers understand the difference between HBCUs and HWCUs.

To begin with, African-American students' academic and parental background characteristics differ between the two types of institutions. Mirroring the literature, the HWCUs in our sample are more affluent than HBCUs in terms of institution-wide academic resources. In addition, white institutions tend to have more African-American students from families with higher parental income. Based on mean comparison, African-American students in White-majority institutions also were more academically prepared in terms of mean high school GPAs and SAT scores (Table 1). Interestingly, however, African-Americans at HBCUs had the exact same level of degree aspirations as their counterparts at HWCUs. College GPAs of African-American students did not differ significantly between the two types of institutions (Table 1). Women's degree completion rate was higher than men's (66% vs. 49%), while the degree completion rate of HBCUs is 55% and that of HWCUs is 63%.

To describe differences between institutional academic environments, we examined selected characteristics of faculty, students, expenditures, and curriculum that can be related to degree completion. Consistent with Kim (2002a), HWCUs tend to have a higher percentage of faculty with a Ph.D., higher average faculty salaries, and a higher proportion of instruction-related expenditure per FTE student than HBCUs (Table 1), all of which are positively related to the outcome. On the other hand, HBCUs tend to have a lower student–faculty ratio, lower enrollment, and somewhat higher student–faculty interaction (Table 1), all of which are positive predictors of student development in general (Astin, 1993; Pascarella and Terenzini, 1991, 2005). The two types of institutions seem to have differently compensating environmental factors.

Although some previous studies indicate that African-American students are more likely to graduate from HBCUs than from HWCUs, the institutionally reported data in this study suggests that the overall percentage of students transferring during their undergraduate years is higher in HBCUs. At the same time, HBCUs are making meaningful efforts to retain African-American students. For example, from the mean comparison of Table 1, African-American students are more likely to be involved in faculty's research projects at HBCUs, and this involvement is a positive predictor for degree completion, according to our HNLM analysis in this study, as discussed below.

We also examined the course status of curriculum offerings in freshman core course, freshman seminar, and senior seminar between the two types of institutions as well as the effect of these courses on the outcome. In our sample, the freshman core-curriculum seems to differ: HBCUs tend to offer more freshman core-courses as requirements than HWCUs. Table 1 shows that no HBCU has freshman or senior seminar courses (mean: 1, SD: 0). (In HNLM analysis, institutional emphasis on senior seminar courses is positively related to increasing the odds of degree completion).

Using HNLM Analysis to Examine the Effects of Attending HBCUs

Before building models with predictors, we analyzed unconditional ANOVA models. An ANOVA model has only an outcome variable; it is a no-predictor model. In HLM, this basic model provides some useful information, such as the estimated grand mean, a reliability estimate, and baseline variances for individual level and college level that enable us to calculate an intraclass correlation (a measure of within-college dependency). As for the HNLM models of degree completion, HNLM does not provide a baseline variance to calculate an intraclass correlation at the individual level because the variance decomposition is not meaningful when the nature of the outcome variable is binominal (degree completion vs. non-completion).

While we do not present the unconditional ANOVA model output, we extracted some useful information to enhance the understanding of multilevel models. To begin with, the estimated grand mean (intercept) of degree completion was 0.599. The average in college-level unit reliability of degree completion is 0.763; reliability estimates that seem to be moderate considering their sizes are related to the number of sampled students within each institution as well as the individual- and institution-level variances (Raudenbush and Bryk, 2002).

THE PROBABILITY OF OBTAINING A BACCALAUREATE DEGREE

Student-level Model

Table 2 presents the results of HNLM analysis used to determine the probability of obtaining a BA. The individual-level model includes students' gender (female), students' high school GPA, SAT scores, mother's education, and initial degree aspiration. All of these variables were positively associated with the probability of obtaining a baccalaureate degree. However, initial degree aspiration was not a significant predictor for the degree completion ($p > 0.10$), controlling for the four other independent variables.

The coefficients in the student-level model represent the estimated effects on differences in adjusted mean graduation rates across colleges—the odds ratio of graduation $[p/(1-p)]$ due to a one-unit change in the independent variable to the odds of graduation without the change. The intercept term for the student-level model is the estimated mean graduation rates for colleges.

Table 2 shows that both high school GPA and SAT are positive predictors of degree completion. Many educators and researchers believe that high school GPA and SAT scores capture and reflect students' academic preparation and scholastic aptitude. Our data suggests that good grades might be a more powerful predictor of graduating from college than high SAT test scores among African-American students. Parental income was removed because its effect was trivial when mother's education level was controlled and it was correlated with mother's education ($r = 0.38$). The positive effect of mother's education is somewhat consistent with the literature on African-American family structure (Hrabowski, Maton, and Greif, 1998; McCubbin, Thompson, Thompson, and Futrell, 1998)—that is, the female-headed family structure often visible among African-American families. Being female is positively related with the odds of degree completion. We conducted the analyses of gender interactions and found not to be of importance with the data set.

Twenty-one percent of the college-level variance was explained by the individual-level model; 59% of the variance was explained by the global college model; and 71% was explained by the full model. The addition of college structural and internal measures increased the explained variance by 50%. In short, differences in the college characteristics explain the majority of the college-level variance.

Institution-level Models

The global college model was created to test the null hypothesis of the effectiveness of HBCUs versus that of HWCUs. To test the effect of HBCUs on degree completion, the global college model included four institution-level variables (in addition to the five individual-level variables): Black college status, selectivity in admission (institutional mean SAT), private college status (institutional control), and enrollment size. The null hypothesis (there is no differential institutional effect between HBCUs and HWCUs in African-American students' probability of obtaining a bachelor's degree) was not rejected. After controlling for all the other variables in the model, attending an HBCU vs. an HWCU does not make a significant difference in African-American students' college degree completion. The 95% confidence interval is (−2.496, 0.35), whose interval includes zero, suggesting the probability of no difference between Black and White institutions in students' degree completion. In other words, students in Black colleges tend to have slightly lower chances of graduation, but the difference did not seem to be statistically significant—a finding that contradicts those of Cross and Astin (1981), Ehrenberg and Rothstein (1993), and Pascarella et al. (1987).

Taking individual students' academic preparation and/or ability into account, attending a selective institution does not particularly enhance the probability of obtaining a BA degree. It is important to note that we included the selectivity variable even though it was not a significant predictor in the model (especially including individual-level SAT scores). We initially decided to include selectivity regardless of its significance because college selectivity can be a very important factor influencing institutional missions and priorities, as well as student peer characteristics. Moreover, the results concerning HBCU effectiveness differed from those of the HNLM model that did not include selectivity. When we did not control for the selectivity variable, attending an HBCU turned out to be a significant negative predictor for degree completion. In other words, controlling for institutional selectivity, the differences between the two types of institutions are negligible.

The intention behind the full model was to explore why there is an institutional effect and to learn which internal institutional variables explain (promote or deter) a student's probability of graduation. Although the null hypothesis was not rejected, we further explored influential internal college characteristics that might promote students' degree completion. Thus, three additional institutional-level variables were added to the full model: instructional expenditure per FTE student, aggregated

student involvement in professors' research projects, and senior seminar curriculum status.

Table 1 shows that HBCUs' instructional expenditure per FTE student was much lower than that of HWCUs. The amount of expenditure was positively associated with students' degree completion, though it did not seem to make a significant difference in the outcome. Including the instructional expenditure variable did not improve the model. In other words, instructional expenditure does not matter so much in graduating students. Human factors might be more powerful than money factors.

Aggregated student involvement in professors' research projects and senior seminar curriculum status were positively associated with the outcome—degree completion. Holding global college characteristics and student background characteristics constant, we found that involvement in professors' research projects and having a senior seminar course appear to enhance the odds of degree completion. It is also important to note that the HBCU coefficient increased sharply (negative direction) in the full model. This increase was mainly due to the inclusion of the variable "involvement in professors' research project." The coefficient and *t*-ratio changes in HNLM models (Table 2) indicate that HBCUs provide or promote more positive college experiences, such as engagement in professors' research projects, for their African-American students than do HWCUs. Additional mean comparison and correlation analysis (Table 1) suggest that opportunities for African-American students' involvement in research projects are significantly more favorable on HBCU campuses. HWCUs are, however, more likely to offer students senior seminars; no sampled HBCU offered a senior seminar course.

Notably, the expenditure variables were not significant predictors for the outcome. In other words, different instructional expenditures between the two types of institutions may not be directly connected with or decisive in determining degree completion. Initially we also considered average faculty salary as a resource indicator, but we had to remove it from the models because it was very strongly correlated with selectivity in admission ($r = 0.80$) and strongly correlated with enrollment ($r = 0.56$). Also, average faculty salary and instructional expenditure had a moderate strength of correlation ($r = 0.32$).

We did not encounter any sign or warning of multicollinearity throughout the HNLM analysis. We checked the changes in the pattern of regression coefficients and the size of standard errors, and we employed other diagnostic tools to check for multicollinearity.

DISCUSSION OF FINDINGS, IMPLICATIONS FOR PRACTICE, AND FUTURE RESEARCH

This study aimed to provide findings to help policymakers, educators, and students become better informed regarding the effects of attending HBCUs on Black students' degree completion. Using nine-year longitudinal data and hierarchical non-linear modeling analyses, this study found that attending either an HBCU or an HWCU results in a similar probability of obtaining a BA degree. Our preliminary analysis (Table 1) showed that the mean degree completion rate did not differ significantly between HBCUs and HWCUs.

We also found that college GPAs of African-American students did not differ between the two types of institutions, which is inconsistent with previous studies that used students' mean GPAs as a comparative reference or a measure of institutional effectiveness on students' academic success (Allen, 1987; Allen and Wallace, 1988; Anderson, 1984; Fleming, 1984; Wenglinsky, 1996). Another new finding from our descriptive analysis is that a higher (almost 1.5 times) proportion of African-American students at HBCUs had worked with faculty on their research. This finding suggests that HBCUs might provide more academic opportunities to African-American students which is consistent to Kim (2004). At the same time, this study confirmed previous findings (Allen, 1992; Kim, 2002a) that institutional educational resources (e.g., instruction-related expenditure per FTE student, percentage of faculty with a Ph.D.) are markedly greater at HWCUs and that the level of students' academic preparation as well as that of their parental income is higher among African-American students at HWCUs.

The finding of no differential effect of HBCUs on obtaining a bachelor's degree is inconsistent with Cross and Astin (1981), Pascarella et al. (1987), and Ehrenberg and Rothstein (1993), who reported that matriculation at an HBCU is positively associated with students' securing a bachelor's degree. Significantly, these latter studies and this study used different data sets and methods (single-level vs. multi-level regression analysis). It could well be that Black students are adapting to White institutions better today than they were more than a decade ago, not least because HWCUs have had some success in addressing the chilly and discriminatory climate often associated with them.

Individual-level student characteristics were included in the study to control for the pre-collegiate characteristics that might affect African-American students' degree completion. It is interesting to note the long-term effect of pre-college academic preparation on degree completion. High school GPA and SAT were found to be the most influential

variables in college completion. It is also important to point out gender effects in degree completion. Consistent with Kim et al. (2003), females were found to be more likely to graduate than males among African-Americans. Nettles and Perna (1997) have also reported that among recent African-American baccalaureate degree recipients, fewer than one-fifth of men and fewer than one-third of women completed their degrees within four years.

In the study both percentage of participation in research projects with faculty and status of senior seminar were positively associated with degree completion among African-Americans. Helping more undergraduates participate in professors' research projects (Nagda et al., 1998) and providing senior seminar curricula seem to be good strategies for improving students' retention and graduation. The senior seminar requirement may promote students' engagement and reduce their anxiety and uncertainty during the senior year; once again, more research is needed that explores the association between senior seminar courses and degree completion. These are examples that Astin's involvement theory and Kuh's seamless learning environment concept can intertwine and, in so doing, contribute to African-American students' meaningful academic experiences.

We did not find instructional expenditure per FTE student making a significant difference in students' degree completion. Future research examining additional internal characteristics variables may help to provide an enhanced foundation for institutional decision-making.

Researchers who have studied retention, dropout, and college impact (e.g., Astin, 1975, 1993; Pacarella and Terenzini, 1991; Tinto, 1975) have noted that student–faculty interaction and student–student interaction are important. In our study, however, these two types of interactions were not found to be significant predictors. We believe that academically engaging interactions such as participation in research projects may be more meaningful and influential for African-American students' degree completion than other, less purposeful, interactions between student and faculty. For results of mean comparison and HLM analyses suggest that African-American students' opportunities for involvement in research projects are more favorable on HBCU campuses. This may well be because African-American students are still more likely to be "marginalized" than White students in HWCUs.

Limitations

While using a national-scale nine-year longitudinal data set is a major strength of this study, the absence of some important information

circumscribed our research scope and statistical modeling. Like most nationally collected existing data sets, which are often created for general or multiple purposes, the CIRP nine-year follow-up data set does not have all the desirable variables for this study. Although the nine-year survey purposefully oversampled HBCUs and African-American students based on HERI's grant support, the sample size is still small and the number of variables describing college experiences are very limited. Because the institutions and respondents were oversampled and participated in the survey by the combination of the institutional pay-based participation and HERI's stratified sampling methods, the data might be considered as non-representative. Nevertheless, the gender ratio of each type of institutions and the gap of academic test scores (e.g., SAT) between HBCUs and HWCUs are similar to the nationally reported data (NCES, 1996, 2003).

Moreover, we cannot ignore a possibility of response bias. Those who graduated from college would be more likely to respond to the follow-up than those who did not, although a relatively high percentage (about 40%) of students did not graduate by the time of the follow-up survey. However, it is not likely that student response patterns would systematically differ between the two types of institutions.

Conclusion

In broad strokes, our research has shown that there is no differential impact between HBCUs and HWCUs in terms of degree completion. On the one hand, our findings do not support the results of a small number of earlier studies that found that HBCUs have a more positive effect on African-American students' college graduation rates. On the other hand, our findings show that HBCUs are doing as well as HWCUs in producing African-American college graduates. That HBCUs are doing as well as HWCUs seems to us to be quite remarkable in light of two major considerations. First, HBCUs, on average, have relatively fewer resources—from physical facilities to financial support and faculty salaries—than HWCUs. Second, African-American students attending HBCUs have traditionally done less well academically in high school than their HWCU counterparts, yet they are performing as well in terms of college graduation. HBCUs may be providing higher levels of graduation for less academically prepared African-American students. In light of our conclusion regarding the salutary effects of HBCUs on African-American students, future research should—above all else —probe more deeply into HBCUs. How are they able to have

such an impact with relatively few resources and with students with backgrounds who have performed less well than their counterparts at HWCUs before entering college? Or, what can all of us in higher education learn from HBCUs?—a question raised by only a handful of contemporary scholars (Conrad, Brier, and Braxton, 1997). In order to address these questions, researchers might have to bring in additional data and analytical lens.

In short, HBCUs—even while significantly under-funded—are having no less of an impact on the academic success of African-Americans compared to HWCUs. Not least significant, HBCUs are taking initiatives—such as having students conduct research with faculty—to advance the academic success of African-American students. Not only can HWCUs learn from HBCUs about how to enhance their impact on African-American students, but also public policymakers and private citizens alike may justifiably have an enhanced appreciation for the positive role of HBCUs. As a result, they may well choose to increase their investments—pecuniary and otherwise—to ensure that these institutions continue to remain an integral part of the fabric of higher learning in the United States.

APPENDIX

Variables and Coding Scheme

Individual-level variables	
Student's gender	0 = male and 1 = female
Age of student on 12/31/89	Ten-point scale from 1 = 16 or less, 2 = 17 to 10 = 57 or more
Degree aspiration in 1985	Ph.D., M.D., D.D.S., D.V.M., LL.B., J.D., Doctor of Divinity = 1, Master's degree, B.A. = 0
SAT	Students' combined SAT scores, ranging from 400 to 1600
High school GPA	Average high school grades, eight-point scale from 1 = D to 8 = A or A+
Parental income	Fourteen-point scale from 1 = less than $6000 to 14 = $150,000 or more (measured in 1985)
Mother's education	Eight-point scale from 1 = grammar school or less to 8 = graduate school
College GPA	Average college grades, eight-point scale from 1 = D to 8 = A or A+

APPENDIX. (*Continued*)

Outcome variable	
Degree completion	0 = Not completed BA degree; 1 = completed BA degree (measured in 1989 and 1994)
Institutional-level variables	
Institutional global characteristics	
Black college (vs. White college)	0 = historically White institution; 1 = historically Black institution
Mean SAT (Selectivity)	Institutional selectivity based on SAT combined scores, ranges from 400 to 1600
Institutional total enrollment	
Single-sex college	0 = coeducational college, 1 = single-sex college
Private college	0 = public institution, 1 = private institution
Total enrollment	
Institutional internal characteristics	
Percentage: total instruction-related expenditure	
Total instruction-related expenditure per full-time-equivalent (FTE) student	
Percentage: undergraduates receiving aid	
Percentage: students transferring before graduation	
Average faculty salary	
Percentage: faculty with a Ph.D.	
Student–faculty ratio	
Percentage: female faculty	
Percentage: research project with faculty	
Student–faculty interaction	
Curriculum: freshman core	0 = Not required; required = 1
Curriculum: freshman seminar	
Curriculum: senior seminar	

REFERENCES

Allen, W. (1987). Black colleges vs. White colleges: The fork in the road for Black students. *Change* 19(3): 28–31, 34.

Allen, W. (1992). The color of success: African American college student outcomes at Predominantly White and Historically Black public colleges and universities. *Harvard Educational Review* 62(1): 26–44.

Allen, W., Epps, E., and Haniff, N. (1991). *College in Black and White: African American Students in Predominantly White and in Historically Black Public Universities*, SUNY Press, Albany, NY.

Allen, W. R., and Farley, R. (1986). The shifting social and economic tides of Black America, 1950–1980. *Annual Review of Sociology* 12: 277–306.

Allen, W., and Wallace, J. (1988). Black students in higher education: Correlates of access, adjustment, and achievement. ASHE Annual Meeting paper (October), ED303089.

American Council on Education (2002). *The Continuing Significance of Racism: U.S. Colleges and Universities*. Author, Washington DC.

Anderson, K. L. (1984). *Race Differences in the Effects of College Characteristics on Educational Attainment (Research Report)*, National Institute of Education, Washington DC, ED256249.

Astin, A. (1975). *Preventing Students from Dropping Out*, Jossey-Bass, San Francisco.

Astin, A. W. (1984). Student involvement: A developmental theory for higher education. *Journal of College Student Personnel* 25: 297–308.

Astin, A. W. (1991). *Assessing Educational Excellence*, Jossey-Bass, San Francisco, CA.

Astin, A. W. (1993). *What Matters in College: Four Critical Years Revisited*, Jossey-Bass, San Francisco.

Bean, J. P., and Metzner, B. S. (1985). A conceptual model of nontraditional undergraduate student attrition. *Review of Educational Research* 55(4): 485–530.

Beeghley, L. (1989). *The Structure of Social Stratification in the United States*, Allyn and Bacon, Boston, MA.

Bohr, L., Pascarella, E. T., Nora, A., and Terenzini, P. T. (1995). Do Black students learn more at Historically Black or Predominantly White Colleges? *Journal of College Student Development* 36(1): 75–85.

Bowles, S., and Gintis, H. (1976). *Schooling and Capitalist America*, Basic Books, New York.

Braxton, J. M. (2000). *Reworking the Student Departure Puzzle*, Vanderbilt University Press, Nashville.

Braxton, J. M., and Lien, L. A. (2000). The validity of academic integration as a central construct in Tinto's interactionist theory of college student departure. In: Braxton, J. M. (ed.), *Reworking the Student Departure Puzzle*, Vanderbilt University Press, Nashville.

Bryk, A. S., and Raudenbush, S. W. (1992). *Hierarchical Linear Models: Applications and Data Analysis Methods*, Sage, Newbury Park, CA.

Bryk, A. S., and Thum, Y. M. (1989). The effects of school organization on dropping out: An exploratory investigation. *American Educational Research Journal* 26: 353–383.

Burstein, L. (1980). The analysis of multi-level data in educational research and evaluation. *Review of Research in Education* 8: 158–233.

Centra, J., Linn, R., and Parry, M. (1970). Academic growth in predominantly Negro and predominantly White colleges. *American Educational Research Journal* 7(1): 83–98.

Collins, R. (1979). *The Credential Society: An Historical Sociology of Education and Stratification*, Academic Press, New York.

Conrad, C. F., Brier, E. M., and Braxton, J. (1997). Factors contributing to the matriculation of White Students in public HBCUs. *Journal for a Just and Caring Education* 3(1): 37–62.

Cross, P., and Astin, H. (1981). Factors influencing Black students' persistence in college. In: Thomas, G. (ed.), *Black Students in Higher Education*, Greenwood Press, Westport, CN, pp. 76–90.

Ehrenberg, R. G., and Rothstein, D. S. (1993). *Do Historically Black Institutions of Higher Education Confer Unique Advantages on Black Students: An Initial Analysis*. National Bureau of Economic Research, Cambridge, MA, Unpublished paper.

Ethington, C. A. (1997). A hierarchical linear modeling approach to studying college effects. In: Smart, J. S. (ed.), *Higher Education: Handbook of Theory and Research* (Vol. XII), Agathon Press, New York, pp. 165–194.

Ellis, E. W. (1988). *Students' Perceptions of Mentor Relationships at Florida A&M University: A Historically Black Institution*. Research Report. Florida A & M University, Tallahassee, FL. ED305423.

Fleming, J. (1982). Sex differences in the impact of college environments on Black students. In: Perun, P. (ed.), *The Undergraduate Women: Issues in Educational Equity*, Heath, Lexington, MA, pp. 229–250.

Fleming, J. (1984). *Blacks in College*, Jossey-Bass, San Francisco, CA.

Gray, W. H. (1998, April 18). Leader Lauds Role of Black Colleges. *Boston Globe*, Section B, p. 6, col. 6.

Gurin, P., and Epps, E. (1975). *Black Consciousness, Identity and Achievement: A Study of Students in Historically Black Colleges*, Wiley Press, New York.

Heath, T. (1992). Predicting the educational aspirations and graduate plans of Black and White college and university students: When do dreams become realities? *Paper presented at The Annual Meeting of the Association for the Study of Higher Education*, Minneapolis, MN.

Heck, R., and Thomas, S. (2000). *An Introduction to Multilevel Modeling Techniques*, Lawrence Erlbaum Associates Publishers, Mahwah, NJ.

Hemmons, W. M. (1982). From the halls of Hough and Halstead: A comparison of Black students on predominantly White and predominantly Black campuses. *Journal of Black Studies* 12(4): 383–402.

Hrabowski III, F. A., Maton, K. I., and Greif, G. L. (1998). *Beating the Odds: Raising Academically Successful African American Males*, Oxford University Press, New York & Oxford.

Jackson, D. H. (2002). Attracting and retaining African American faculty at HBCUs. *Education* 12(31): 181–185.

Kim, M. (1995). *Organizational Effectiveness of Women-Only Colleges: The Impact of College Environment on Students' Intellectual and Ethical Development*. Unpublished doctoral dissertation. The University of California, Los Angeles.

Kim, M. M. (2001). Institutional effectiveness of women-only colleges: Cultivating students' desire to influence social conditions. *The Journal of Higher Education* 72(3): 287–321.

Kim, M. M. (2002a). Historically Black vs. White institutions: Academic development among Black students. *The Review of Higher Education* 25(4): 385–407.

Kim, M. M. (2002b). Cultivating intellectual development; Comparing women-only colleges and coeducational colleges for educational effectiveness. *Research in Higher Education* 43(4): 447–481.

Kim, M. M. (2004). The experience of African-American students in historically black institutions. *The NEA Higher Education Journal: Thought and Action* XX(1): 107–124.

Kim, M. M., and Placier, M. (2004). Comparison of academic development in catholic versus non-catholic private secondary schools. *Education Policy Analysis Archives* 12(5): 1–29.

Kim, M. M., Rhoades, G., and Woodard, D. (2003). Sponsored research versus graduating students?: Intervening variables and unanticipated findings in public research universities. *Research in Higher Education* 44(1): 51–81.

Kuh, G. D. (1993). In their own words: What students learn outside the classroom. *American Educational Research Journal* 30(2): 277–304.

LaVant, B. D., Anderson, J. L., and Tiggs, J. W. (1997). Retaining African American men through mentoring initiatives. *New Directions for Student Services* 80: 43–53.

Lee, V. E., and Bryk, A. S. (1989). A multilevel model of the social distribution of high school achievement. *Sociology of Education* 62(3): 172–192.

McCubbin, H. I., Thompson, E. A., Thompson, A. I., and Futrell, J. A. (1998). *Resiliency in African-American families*. Resiliency in Families Series (Vol. 3). Sage Publications, Inc, Thousand Oaks, CA.

McDonough, P. M., Antonio, A. L., and Trent, J. W. (1997). Black students, Black colleges: An African American college choice model. *Journal for a Just and Caring Education* 3(1): 9–36.

Nagda, B. A., Gregerman, S. R., Jonides, J., Hippel, W., and Lerner, J. S. (1998). Undergraduate student-faculty research partnerships affect student retention. *The Review of Higher Education* 22(1): 55–72.

National Center for Education Statistics (1996). *Historically Black Colleges and Universities, 1976–1994*, U.S. Department of Education, Washington DC.

National Center for Education Statistics (2003). *Digest of Education Statistics, NCES 2003-060*, U.S. Department of Education, Washington DC.

Nettles, M. T. (1988). *Toward Black Undergraduate Student Equality in American Higher Education*, Greenwood, Westport, CT.

Nettles, M., and Perna, L. (1997). *The African American Education Data Book. Volume III: The Transition from School to College and School to Work*. Frederick D. Patterson Research Institute of the College Fund/UNCF, Washington, DC.

Pascarella, E., Edison, M., Nora, A., Hagedorn, L. S., and Terenzini, P. (1996). Additional evidence on the cognitive effects of college racial composition: A research note. *Journal of College Student Development* 37(5): 494–501.

Pascarella, E., and Terenzini, P. (1979). Student-faculty informal relationships and freshman year educational outcomes. *Journal of Educational Research* 71(4): 183–189.

Pascarella, E., and Terenzini, P. (1991). *How College Affects Students*, Jossey-Bass, San Francisco, CA.

Pascarella, E., and Terenzini, P. (2005). *How College Affects Students* (Vol. 2), Jossey-Bass, San Francisco, CA.

Pascarella, E., Smart, J., Ethington, C., and Nettles, M. (1987). The influence of college on self-concept: A consideration of race and gender differences. *American Educational Research Journal* 24(1): 49–77.

Pascarella, E., Smart, J., and Stoecker, J. (1989). College race and the early status attainment of Black students. *The Journal of Higher Education* 60(1): 82–107.

Raudenbush, S., and Bryk, A. (2002). *Hierarchical Linear Models: Applications and Data Analysis Methods* (2nd Ed.), Sage Publication, Thousand Oaks, CA.

Ross, M. J. (1998). *Success Factors of Young African American Males at a Historically Black College*, Bergin & Garvey, Westport, CT.

Rumberger, R. W. (1995). Dropping out of middle school: A multilevel analysis of students and schools. *American Educational Research Journal* 32(3): 583–625.

Spady, W. (1970). Dropouts from higher education: An interdisciplinary review and synthesis. *Interchange* 1: 64–85.

St. John, E. P., Cabrera, A. F., Nora, A., and Asker, E. H. (2000). Economic influences on persistence reconsidered: How can finance research inform the reconceptualization of persistence models? In: Braxton, J. M. (ed.), *Reworking the Student Departure Puzzle*, Vanderbilt University Press, Nashville.

Terenzini, P., and Pascarella, E. (1980). Student faculty relationships and freshman year educational outcomes: A further investigation. *Journal of College Student Personnel* 21(6): 521–528.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research* 45(1): 89–125.

Tinto, V. (1987). *Leaving College: Rethinking the Causes and Cures of Student Attrition*, University of Chicago Press, Chicago.

Thomas, G. E. (1981). College characteristics of Black students' four year college graduation. *Journal of Negro Education* 50(3): 328–345.

Tierney, W. G. (1992). An anthropological analysis of student participation in college. *Journal of Higher Education* 63(6): 603–618.

Wells-Lawson, M. I. (1994). The effects of race and type of institution on the college experiences of Black and White undergraduate students attending 30 Predominantly Black and Predominantly White Colleges and Universities. *Paper presented at the Annual Meeting of the American Educational Research Association*, New Orleans, LA.

Wenglinsky, H. H. (1996). The educational justification of Historically Black Colleges and Universities: A policy response to the U.S. Supreme Court. *Educational Evaluation and Policy Analysis* 18(1): 91–103.

Willie, C. V. and Edmonds, R. R. (1978). *Black Colleges in America: Challenge, Development, Survival*, Teachers College Press, New York.

Wolf-Wendel, L. E., Baker, B. D., and Morphew, C. C. (2000). Dollars and $ense: Institutional Resources and the Baccalaureate Origins of Women Doctorates. *The Journal of Higher Education* 71(2): 165–186.