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ABSTRACT

This study examined differences in educational experiences and performance of white, black, and Hispanic graduate students. The 1,352 students in the sample were selected from four large public research universities and were polled using a 142-item questionnaire, organized in the following categories: (1) demographic characteristics (sex, gender, race, and age); (2) undergraduate education; (3) transition from undergraduate school to doctoral program (time off, financial indebtedness, attendance status, change of major field); (4) experiences while enrolled in graduate school (faculty mentors, student interactions, time spent studying); (5) sources of financial support; (6) doctoral program outcome (grade point average and satisfaction with program) While the study found some similarities among the students surveyed, racial group differences were more significant; it was found, for example, that black students came from the poorest socioeconomic backgrounds, had attended less selective undergraduate institutions, and were less likely to major in science at the undergraduate level; that Hispanic students were more often full-time students, were more likely than black or white students to receive fellowships, and were more likely to be science majors in graduate school; that Hispanic students had the greatest amount of social involvement; and that black students felt more strongly than whites that mentors were supportive. (Contains 27 references.) (CH)

Black, Hispanic, and White Doctoral Students: Before, During, and After Enrolling in Graduate School

Michael T. Nettles

A research report of the Minority Graduate Education (MGE) Project, jointly sponsored by the Graduate Record Examinations Board and Educational Testing Service.

BLACK, HISPANIC, AND WHITE DOCTORAL STUDENTS: BEFORE, DURING, AND AFTER ENROLLING IN GRADUATE SCHOOL

by
Michael T. Nettles

INTRODUCTION

In comparison to White students, relatively few Black and Hispanic students enter graduate school, and even fewer succeed in obtaining a doctoral degree. In 1985, for example, Black students represented more than 12 percent of the U.S. population and Hispanic students more than 7 percent, but they represented only 4.7 percent and 2.8 percent, respectively, of students who earned doctorates (National Center for Education Statistics, 1986). These striking disparities give rise to questions concerning the factors that contribute to the small numbers of minority students who receive doctoral degrees and the changes that are needed in order to improve their retention and doctoral completion rates.

Few studies have compared or described Black, Hispanic, and White graduate students. The few studies that have been conducted have focused primarily on comparing graduate grade-point averages and validating admissions criteria. As a result, not much is known about the Black and Hispanic students who enroll in graduate programs and how they compare with their White peers. Very little information exists about how the background characteristics and undergraduate educational preparation of these students relate to their transition from undergraduate to graduate school, their graduate school experiences, and their grades and satisfaction while enrolled in doctoral programs.

Michael Nettles' technical research report, *Comparing the Backgrounds, Educational Experiences, and Outcomes of Black, Hispanic, and White Doctoral Students*, sponsored by the Center for Postsecondary Governance and Finance and the GRE Board, addresses these issues. Data were gathered through an extensive survey that included a 142-item questionnaire developed with the assistance of associate deans at the four participating institutions — Florida State University, Ohio State University, Rutgers University, and the University of Maryland at College Park. Although the results of the survey, which was administered to approximately 1,300 doctoral students at these institutions, may not be representative of all doctoral students in the United States, the participating institutions are among the leading producers of Black and Hispanic doctoral recipients in the past decade (National Research Council, 1976-1985) and offered a large and diverse sample.

The report compares and contrasts the background characteristics — age, gender, race, socioeconomic status — of these students before they enter undergraduate and graduate school; their performance and academic preparation in undergraduate school; the types of transitions they make into graduate school; and their experiences, attitudes, and performance after they enroll in doctoral programs. The main objectives of the study were to provide the basis for a better understanding of the differences in the educational experiences and performance of Black, Hispanic, and White doctoral students; to identify the factors that contribute to the differences among these three groups; and to develop recommendations for improving the doctoral experiences and performance of minority students.

The Hispanic sample in this study is predominantly Puerto Rican. The results may have been different if Mexican American, Cuban American, and other Hispanic groups were better represented.

The study reveals a few similarities and a number of differences among Black, Hispanic, and White doctoral students:

- Black students attended less selective undergraduate institutions than White and Hispanic students did. The Hispanic students attended the most selective undergraduate institutions of the three groups.
- Students from backgrounds of relatively high socioeconomic status (SES) went to more selective undergraduate institutions than students from lower SES backgrounds. Students' gender was not significantly related to the selectivity of their undergraduate institution.
- Black students were less likely than both Hispanic and White students to major in the sciences at the undergraduate level, and women were less likely than men to major in the sciences at the undergraduate level. SES was found to have little relationship to undergraduate major field.
- Neither race nor SES was found to have much bearing on the amount of money students borrowed to complete their undergraduate work. Male students, however, were more in debt than female students were when they finished their undergraduate programs.
- Hispanic students took less time off than Black and White students before beginning work on their doctoral degrees. Students who took the greatest amount of time off were likely to have relatively low undergraduate grade-point averages, were more likely to be women than men, had lower amounts of undergraduate indebtedness, and had low SES backgrounds. They were also less likely to have been science majors as undergraduates.
- There was no significant relationship between race and a student's decision to begin doctoral work in a field that differed from the student's undergraduate major.
- Hispanic students were more likely than Black and White students to receive fellowships or assistantships. After background and undergraduate education were considered, the Black and White students received about the same number of graduate fellowships and assistantships.
- Hispanic students were more likely than their Black or White counterparts to attend graduate school full-time.
- Of the three groups, Hispanic students had the greatest amount of social involvement.[1]
- In their perceptions of mentor[2] support, Black students felt more strongly than their White counterparts did that their mentors were supportive.

[1]For the purpose of this study, social involvement included making friends easily; socializing informally with students; socializing informally with faculty members; and participating in clubs, organizations, or student government groups.

[2]For the purpose of this study, a mentor was described as someone on the faculty to whom the student turned for advice, critique of a manuscript, or general support or encouragement. This person was normally not the student's assigned faculty advisor.

- Of the three groups, Black students expressed the strongest feelings that their universities were discriminatory, and Hispanic students expressed stronger feelings of discrimination than White students did. Students who felt most strongly that their universities were discriminatory were more likely to be women and those who took relatively little time off between undergraduate and graduate school. These students also were less likely to have fellowships or assistantships.
- Black students reported lower doctoral grade-point averages (DGPA) than both Hispanic and White students, and Hispanic students reported lower DGPAs than their White counterparts.
- Black students were significantly more satisfied with their doctoral programs than both the Hispanic and White students; Hispanic students were more satisfied than their White counterparts.

The following is a condensed, nontechnical report of Nettles' findings.

THE STUDY

This study reviewed the relevant literature on minority student access, experiences, and performance in graduate school and surveyed 1,352 doctoral students attending four large public graduate institutions. The following questions were addressed:

- What are the demographic background characteristics (i.e., age, gender, race, and socioeconomic status) of Black and Hispanic doctoral students, and how do these students differ from each other and their White peers?
- Are there differences in the undergraduate educational backgrounds (i.e., undergraduate major field, undergraduate grade-point average, selectivity of undergraduate institutions, and undergraduate financial indebtedness) of Black, Hispanic, and White doctoral students?
- Do Black, Hispanic, and White doctoral students differ in the types of transitions they make from undergraduate to graduate school? Factors include the amount of time they take after receiving baccalaureate and master's degrees to begin their doctoral programs, the amount of any unpaid undergraduate loan balances they have immediately after undergraduate school and at the time they enter graduate school, their likelihood of changing major fields of study between undergraduate and graduate school, and the scholarships and assistantships they receive to attend graduate school.
- Are there differences among Black, Hispanic, and White students in terms of their doctoral program experiences and outcomes? These differences include whether they are full-time or part-time students, the amount of time they devote to their academic work, whether they have mentors, the amount of support they receive from their mentors, the amount of interaction they have with faculty, the amount of social interaction they have with peers, their perceptions of whether their institutions are racially discriminatory, their doctoral grade-point averages, and satisfaction with their doctoral programs.
- How are Black, Hispanic, and White doctoral students' backgrounds and types of transitions to graduate school related to their experiences in graduate school and their educational outcomes?

SUMMARY OF LITERATURE REVIEW

The existing research literature on the backgrounds, experiences, and performance of graduate students and the factors related to their performance suggests the following:

- Prior research has been inconclusive about differences in the graduate school performance of Black, Hispanic, and White doctoral students. Heretofore, researchers have either limited their focus to a single discipline (Bruce, 1977), failed to disaggregate minorities to examine differences between Black and Hispanic students (Wilson 1979), or focused on only a single group's performance without comparing it to other groups (Allen, Haddad, and Kirkland, 1984).
- Traditionally, higher SES students and White students have been overrepresented in graduate school compared to relatively low SES students and minority students (Dresch, 1974; National Center for Education Statistics, 1977-1986). Despite this fact, students' personal backgrounds, such as sex, age, and socioeconomic status, have been found to be nonsignificant predictors of performance in graduate school after the selectivity of their undergraduate institutions was considered (Astin, 1982; Berg and Ferber, 1983; Ethington and Smart, 1986; Ott and Markewitz, 1985). Little is known about the relationship of race to performance after controlling for undergraduate education. Wilson (1979, 1982), however, found that regardless of race, students with higher undergraduate grades also received higher grades in graduate school.
- Majoring in the same field at the undergraduate and graduate levels has also been found to enhance students' experiences in graduate programs (Smart, 1987), but it is not known whether these effects are the same for members of different racial and ethnic groups.
- Financial indebtedness was found to have no significant relationship to students' decisions about going to graduate school immediately after completing undergraduate school (Boyd and Martin, 1985; Davis, 1982; Ekstrom, et al., 1988), but the long-term effects of indebtedness for students who do not enter graduate school until several years after receiving their undergraduate degrees are not known.
- Students' social experiences while enrolled in graduate programs are believed to be the most important influence on their persistence and performance in graduate school, even to the point of mitigating the effects of undergraduate education and graduate school performance (Blackwell, 1987; Girves and Wemmerus, 1986; Hartnett, 1976).
- Minority students report feeling alienated and do not appear to be very satisfied with their graduate institutions (Allen, Haddad, and Kirkland, 1984; Carrington and Sedlacek, 1976; Clewell, 1987). It has not been determined, however, how students of different minority groups differ in their feelings and perceptions, how minority students' feelings and perceptions compare with majority students, or how these feelings and perceptions relate to performance.
- Full-time graduate school attendance has been found to be generally beneficial to students' retention and rate of progress toward receiving a degree (Clewell, 1987; Girves and Wemmerus, 1986; Ott and Markewitz, 1985). Few specifics are available about differences in the full-time attendance status of Black, Hispanic, and White students.

Sample Selection Procedures

A two-stage design was used for selecting the sample. In the first stage, four large public research universities that are among the 25 leading producers of Black and Hispanic doctoral students were selected. These institutions — Florida State University, Ohio State University, Rutgers University, and the University of Maryland at College Park — enroll students in a broad array of major fields at the doctoral level and are classified as Carnegie I or II institutions (Carnegie Council on Policy Studies in Higher Education, 1976).

In the second stage, a sample of doctoral students enrolled in these institutions was selected. The students were enrolled either full- or part-time during the fall of 1986 in graduate departments of education, the social sciences, the humanities, or the biological or physical sciences. They also had completed at least one year of their doctoral studies before the fall of 1986. The resulting sample totaled 1,352 students — 313 (23 percent) Black, 143 (11 percent) Hispanic, and 931 (69 percent) White — all at various stages in their doctoral programs.

The Survey Instrument and Variables in the Study

The Doctoral Student Survey (DSS) used in polling the students contained 142 items. Table 1 presents the response rates for each of the three groups and for each of the four institutions in the study.

DSS items were used to describe and contrast Black, Hispanic, and White students in this study according to the following categories:

- Demographic characteristics
- Undergraduate preparation
- Transitions from undergraduate school to doctoral programs
- Experiences while enrolled in graduate school
- Financial assistance
- Outcomes of the doctoral program.

Demographic characteristics included age, gender, race, and socioeconomic status (SES). Each of these characteristics, with the exception of SES, was measured by a student's response to a single item on the DSS, which asked the respondent to select the characteristics that most closely described him or her. SES was established through a formula that combined mother's education, father's education, mother's occupation, and father's occupation.

Undergraduate preparation measures included the selectivity of each student's undergraduate institution, undergraduate major field of study, and undergraduate grade-point average.

Transitions from undergraduate school to doctoral programs included such characteristics as change of major field of study between undergraduate and graduate school, degree of financial indebtedness just before entering the doctoral program, and amount of time between receiving a bachelor's degree and entering a doctoral program and between receiving a master's degree and entering a doctoral program.

Experiences while enrolled in doctoral programs included status as a full-time or part-time student; major field of study; the amount of time spent studying; whether the student had a mentor(s), and, if so, the quality of the student's relationship(s) with the mentor(s); the amount of interaction with faculty; social involvement; and feelings of racial discrimination.

The financial assistance data included the type of financial assistance students applied for and received, as well as the types and amounts received from various sources. These data were collected through response to a single item on the DSS.

The two outcomes of doctoral program measures were doctoral grade-point average and satisfaction with the doctoral program. Students were asked to report their grade-point average on a four-point scale. Satisfaction with the doctoral program was determined by a factor analysis of responses to eight items on the questionnaire.

Table 1: Response Rates to Student Questionnaire

	Number of Questionnaires Distributed				Number Returned with Insufficient Address				Adjusted Number of Questionnaires				Number Returned and Response Rate							
													Black		Hispanic		White		Total	
	B	H	W	T	B	H	W	T	B	H	W	T	N	%	N	%	N	%	N	%
Florida State	98	54	258	410	11	2	13	26	87	52	245	384	53	(60.1)	32	(61.5)	180	(73.5)	265	(69.0)
Maryland	110	26	271	407	6	0	8	14	104	26	263	393	81	(77.8)	19	(73.0)	211	(80.2)	311	(79.1)
Ohio State	66	30	222	318	5	0	6	11	61	30	216	307	40	(66.0)	20	(66.7)	158	(73.1)	218	(71.0)
Rutgers	36	31	150	217	1	4	10	15	35	27	140	202	20	(57.1)	21	(77.8)	118	(79.2)	159	(78.7)
Total	310	141	901	1,352	23	6	37	66	287	135	864	1,286	194	(67.6)	92	(68.1)	667	(77.1)	953	(74.1)

B = Black H = Hispanic W = White T = Total

LIMITATIONS OF THE STUDY

The study has a few limitations. First, neither the students nor the institutions selected were representative of all doctoral students or doctoral-granting institutions in the United States. Different findings are possible with students who attend different types of institutions or even similar institutions. However, large public universities of the type included in this research enroll more than 75 percent of all doctoral students and award more than 75 percent of all doctoral degrees annually in the United States.

Second, the sample of doctoral students included only students who had completed at least one year of a doctoral program and were still enrolled. It excluded first-year students and students who dropped out of doctoral programs after only one year of course work. It is possible that including first-year students in the study would have resulted in greater variation in the findings.

Third, most of the students in the Hispanic sample are Puerto Rican. The results may have been different if Mexican American, Cuban American, and other Hispanic groups were better represented.

Fourth, the major-field distributions were determined by the enrollments of the Black and Hispanic students and reflected their actual distribution in doctoral programs at the four institutions. Because the sample of White students was selected from fields to match the Black and Hispanic students, the actual major-field distributions for all White doctoral students attending the universities in the study could not be determined.

DATA ANALYSES

The data analyses were both descriptive and relational. The descriptive analyses used to compare and contrast Black, Hispanic, and White doctoral students were demographic characteristics, undergraduate preparation, transitions from undergraduate to graduate school, doctoral program experiences, doctoral grade-point averages, and satisfaction with doctoral program.

For the relational analyses, a conceptual model was derived by synthesizing the research literature. Figure 1 posits the relationships between doctoral students' demographic backgrounds and undergraduate education and then suggests the relationship of their demographic backgrounds and undergraduate education to their transitions into graduate school, and then to their graduate school experiences and educational outcomes.

Before Undergraduate School: Demographic Background Characteristics

SES, Gender, Race, and Age

The greatest demographic difference among the students was their SES backgrounds. The White students had substantially higher SES backgrounds than both the Black and Hispanic students, and the SES of Hispanic students was higher than that of the Black students. The relatively low SES of Black students compared to Hispanic students resulted from the higher educational and occupational attainment of the Hispanic students' fathers compared to the Black students' fathers.

Table 2 illustrates that while the parents of the majority of students, regardless of race, had not received postbaccalaureate degrees, 45 percent of the fathers and 30 percent of the

Figure 1

Conceptual Model — Factors Related to Minority Students' Experiences and Outcomes in Doctoral Programs

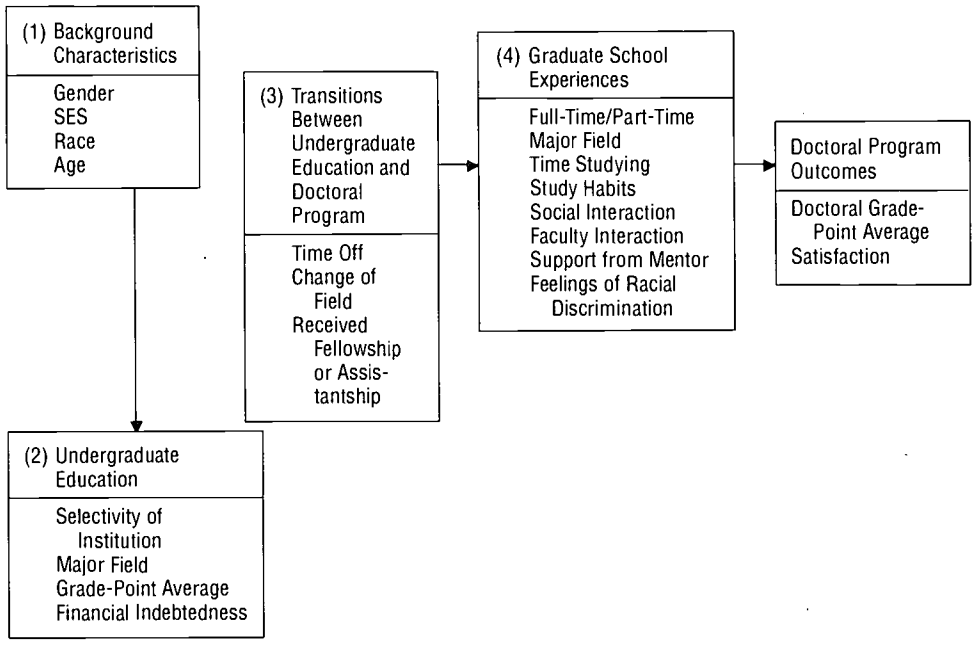

Table 2: Educational Attainment of Parents

	Father's Education						Mother's Education					
	Black		Hispanic		White		Black		Hispanic		White	
	N	%	N	%	N	%	N	%	N	%	N	%
High School or Less	118	60.8	43	46.7	233	34.9	101	52.1	56	60.9	314	47.1
Some College	35	18.0	14	15.2	132	19.8	41	21.1	17	18.5	154	23.1
College Graduate	13	6.7	12	13.0	156	23.4	22	11.3	14	15.2	141	21.1
Advanced Degree	22	11.3	23	25.0	144	21.6	26	13.4	5	5.4	56	8.4
No Response	6	3.1	0	0.0	2	.2	4	2.1	0	0.0	2	.2
	194	100	92	100	667	100	194	100	92	100	667	100
			chi-square = 60.05** df = 6						chi-square = 18.45** df = 6			

* Significant at the .05 level.
** Significant at the .01 level.
[a]The no response category is not included in the chi-square calculations.

Table 3: Occupational Attainment of Parents

	Father's Occupation						Mother's Occupation					
	Black		Hispanic		White		Black		Hispanic		White	
	N	%	N	%	N	%	N	%	N	%	N	%
Professional Small Business/	41	21.1	39	42.4	349	52.3	54	27.9	19	20.7	174	26.1
Skilled Laborer	56	28.9	31	33.7	236	35.4	32	16.5	16	17.4	139	30.8
Laborer	87	44.8	21	23.9	78	11.7	55	28.4	15	16.3	84	12.6
Homemaker	1	.5	1	1.1	0	0.0	48	24.7	41	44.6	265	39.7
No Response	9	4.6	0	0.0	4	.5	5	2.6	1	1.1	5	.7
	194	100	92	100	667	100	194	100	92	100	667	100
			chi-square = 124.36** df = 6						chi-square = 4.04 df = 6			

* Significant at the .05 level.
** Significant at the .01 level.
[b]The no response category is not included in the chi-square calculations.

mothers of White students attained at least a bachelor's degree. By contrast, more than 60 percent of the fathers and 52 percent of the mothers of Black students had a high school diploma or less, while only 18 percent of their fathers and 25 percent of their mothers completed college. Thirty-eight percent of the fathers of Hispanic students and 21 percent of the mothers had at least a baccalaureate degree. The proportion of Hispanic students' parents holding a high school diploma was 47 percent for fathers and 61 percent for mothers.

The figures in Table 3 show that, as with educational attainment levels, the occupational levels of the White and Hispanic students' fathers were significantly higher than that of Black students' fathers. There was little difference in the occupational status of mothers, except that the mothers of Black students were less likely to be homemakers. Slightly more than 50 percent of the fathers and 26 percent of the mothers of White students were classified as professionals,[3] and more than 42 percent of the fathers of the Hispanic students and almost 21 percent of their mothers were professionals. Only about 21 percent of the fathers and 28 percent of the Black students' mothers were professionals. Both the mothers and fathers of the Black students were more likely to be laborers than the parents of the White and Hispanic students. Almost 12 percent of the fathers and about 13 percent of the mothers of the White students, and nearly 24 percent of the fathers and 16 percent of the mothers of Hispanic students were laborers. The Hispanic and White students had the highest percentage of mothers who were homemakers — 45 percent and 40 percent, respectively. In comparison, 25 percent of the mothers of the Black students were homemakers.

[3]For the purposes of this study, professional occupations were defined as those that usually require an advanced degree and included doctors, lawyers, college professors, high-level and mid-level business executives, teachers, accountants, pharmacists, nurses, etc.

The Black students in the sample were significantly more likely to be female (59 percent) than male (41 percent). The gender distributions of Hispanic and White students were more balanced, hovering around 50:50. While the average ages of Black (36) and White (35) students were similar, Hispanic students as a group were slightly younger (33). Twenty-seven percent of the Black and 23 percent of the White students were over age 40, compared to only 13 percent of the Hispanic students.

Undergraduate Education

The Black and Hispanic doctoral students differed in terms of their undergraduate major-field distributions.[4] Education, social sciences, and business were the most popular among Black students — 27 percent, 24 percent, and 23 percent, respectively. By contrast, the Hispanic and White students were more likely to have majored in social sciences, biological/physical sciences, or arts and humanities. The majority of the Hispanic students were enrolled in the social sciences (33 percent), followed by the biological/physical sciences (23 percent), and arts and humanities (17 percent). Female students were considerably less likely than their male counterparts to major in the sciences at the undergraduate level.

Hispanic and White students reported slightly higher undergraduate grade-point averages (UGPA), and, on the average, they attended more selective undergraduate institutions than Black students. However, selectivity of undergraduate institutions was not particularly related to gender. Female students and students with relatively high SES backgrounds had higher UGPAs than male students and students from lower SES backgrounds.

From Undergraduate School to a Doctoral Program: Making the Transition

Time Off After Receiving a Bachelor's and/or Master's Degree

As illustrated in Table 4, the Hispanic students in this study took considerably less time after completing their baccalaureate degrees to enter a doctoral program than Blacks or Whites. Students who took the greatest amount of time off were likely to have relatively low UGPAs, lower SES backgrounds, and were more likely to be female than male. They were also more likely to be nonscience majors in college.

[4]The White students in this study were selected from fields to match those of the Black and Hispanic students. The actual major-field distribution could not be determined for all White students in the four sampled institutions.

Table 4: Students' Time Off After Receiving Bachelor's and Master's Degrees and Before Entering Doctoral Programs

	W	Mean Years	SD	F
Time Between Receiving Baccalaureate Degree and Entering Doctoral Program				
Blacks	194	9.3	7.2	6.40**
Hispanics	92	5.8	5.7	
Whites	667	8.4	7.8	
Time Between Receiving Master's Degree and Entering Doctoral Program				
Blacks	172	5.8	5.8	3.89**
Hispanics	67	3.3	3.6	
Whites	513	5.3	5.9	

* Significant at the .05 level.
** Significant at the .01 level.

The average time between completing a master's degree and entering a doctoral program was more comparable among the three groups. Although a master's degree is not always a prerequisite for entering or completing a doctoral program, nearly 90 percent of the Black, 77 percent of the White, and 73 percent of the Hispanic students indicated having received a master's degree.

Financial Indebtedness after Undergraduate School

Neither race nor SES background had a significant relationship with the amount of financial indebtedness doctoral students incurred for their education. As shown in Table 5, however, financial indebtedness and unpaid undergraduate student loans were more evident among Black and Hispanic students. Among the borrowers, the average loan balances were between $5,000 and $6,000. Hispanic students accumulated slightly higher debt for their undergraduate education, an average of $5,920, compared to $5,283 for Black students and $5,353 for White students.

Male students incurred relatively more debt for their undergraduate education than female students did. The majority of Hispanic and White students who accumulated undergraduate loans retained those loans while pursuing their doctorates. Only 15 percent of the Hispanic borrowers paid off their undergraduate debts before pursuing their doctorates, compared with 52 percent of the Black and 40 percent of the White students. This finding is consistent with the fact that the Hispanic students took significantly less time off after receiving their bachelor's degrees before entering their doctoral programs. Among those who had remaining undergraduate debts, the majority in each group — 67 percent of the Black, 59 percent of the Hispanic, and 56 percent of the White students — owed less than $5,000.

Table 5: Unpaid Loans for Undergraduate Education

	Black N	Black %	Hispanic N	Hispanic %	White N	White %	Chi-Square	df
Amount of Indebtedness								
Immediately after Undergraduate School								
None	104	54.2	52	56.5	424	63.9	.826	4
Up to $4,999	54	28.1	22	23.9	143	21.5		
$5,000 to $9,999	22	11.5	12	13.0	68	10.2		
$10,000 or more	12	6.3	6	6.5	29	4.4		
	192	100	92	100	664	100		
Average Amount Borrowed	$5,283		$5,920		$5,353			
Current Unpaid Balance of Undergraduate Loan								
None	150	78.1	58	63.0	520	78.4	3.12	4
Up to $4,999	28	14.6	20	21.7	80	12.1		
$5,000 to $9,999	6	3.1	9	9.8	39	5.9		
$10,000 or more	8	4.2	5	5.4	24	3.6		
	192	100	92	100	663	100		

* Significant at the .05 level.
** Significant at the .01 level.

Attendance Status

After controlling for backgrounds, undergraduate education, and transitions, the study found students in all three groups equally as likely to be enrolled full-time. Without controlling for those variables, however, the study found 71 percent of the Hispanic, 57 percent of the White, and 49 percent of the Black students to be enrolled full-time.

The relationship of other variables in the model to attendance may explain in part why the Hispanic students in this study were actually more likely to attend graduate school full-time. Full-time students were more likely to have fellowships or assistantships, take less time off between undergraduate and graduate school, be science majors in undergraduate school, have high undergraduate indebtedness, and major in the same field in both undergraduate and graduate school.

Change of Major Field

About two-thirds of the students in each of the three groups chose a doctoral major that was the same as their undergraduate major. Most of the shifting among the one-third that changed majors was due to the relative popularity of doctoral programs in the field of education. In addition, students with relatively low UGPAs changed major fields more often than those with relatively high UGPAs. Enrollment in doctoral education programs was nearly double the enrollment in education programs at the undergraduate level (152 compared to 303). The numbers and proportions of students majoring in the social sciences at both levels were nearly identical — 226 students (24 percent) at the baccalaureate level compared to 224 (24 percent) at the doctoral level. The only difference in choice of majors among the three groups was that Hispanic students were more likely than Black students to major in biological and physical science at the graduate level. Students who major in science in graduate school were more likely to be male, to have been undergraduate science majors, and to have received graduate fellowships or assistantships.

Student Experiences While Enrolled in Doctoral Programs

Faculty Mentors

The majority in each group — 71 percent of the Hispanic, 68 percent of the White, and 63 percent of the Black students — had faculty mentors. Black students felt more strongly than their White counterparts did that their mentors were supportive. None of the remaining variables in the model was significantly related to student perceptions about mentor support. Because the sample included only students who had successfully completed at least one year of doctoral study, it is possible that this finding simply indicates little difference in the perceptions of persisting students concerning their mentors. Mentoring may be such a vital and essential part of doctoral education that all persisting students, regardless of their demographic and educational backgrounds, have similar experiences.

Student Interactions and Involvement

Hispanic students in the sample had greater social involvement than the Black and White students did. Of the three groups, Black students were more likely to feel that their institutions were racially discriminatory. White students had the least social involvement and were least likely to feel that their institutions were racially discriminatory. The students with significantly greater feelings of discrimination tended to not have scholarships or assistantships and to take relatively less time off between undergraduate and graduate school. They were also more likely to be women.

Time Spent Studying

The average number of hours per week spent by the various groups on homework — either reading or preparing for class, writing papers, studying for exams, or writing dissertations — was 26 for Hispanics, 22 for Blacks, and 20 for Whites. The students who devoted the greatest amount of time to studying were nonscience majors, those who received fellowships and assistantships, and those who attended less selective undergraduate institutions.

Financial Assistance

Sources of Support

Personal resources (savings; loans from parents, relatives, friends, and spouse/partner) were the primary source of support for larger proportions of White (35 percent) and Black students (43 percent) than for Hispanic students (21 percent). As indicated in Table 6, teaching and research assistantships were the primary source of support for a much larger percentage of the Hispanic (48 percent) and White (40 percent) doctoral students than for the Black students (29 percent). Black students were also more likely to have loans (14 percent) than Hispanic (9 percent) and White students (6 percent).

Table 6: Financial Aid Applications and Awards Received

	Black N	Black %	Hispanic N	Hispanic %	White N	White %	Chi-Square	df
Applied for Grant/ Fellowship During Doctoral Study								
Yes	82	42.3	41	44.6	162	24.3	32.61**	2
No	110	56.7	51	55.4	494	74.0		
No Response	2	1.0	0	0.0	11	1.7		
	194	100	92	100	667	100		
Received Grant/ Fellowship								
Yes	59	30.4	32	34.8	114	17.1	25.85*	2
No	132	68.0	60	65.2	542	81.2		
No Response	3	1.6	0	0.0	11	1.7		
	194	100	92	100	667	100		
Applied for Loan								
Yes	51	26.3	29	31.5	103	15.4	19.54**	2
No	142	73.2	62	67.4	551	82.6		
No Response	1	.5	1	1.1	13	2.0		
	194	100	92	100	667	100		
Received Loan								
Yes	45	23.2	29	31.5	85	15.4	27.25**	2
No	147	75.8	62	67.4	568	86.2		
No Response	2	1.0	1	1.1	14	2.1		
	194	100	92	100	667	100		
Applied for Teaching/Research Assistantship								
Yes	87	44.9	59	64.1	365	54.7	10.49**	2
No	106	54.6	33	35.9	294	44.1		
No Response	1	.5	0	0.0	8	1.2		
	194	100	92	100	667	100		
Received a Teaching or Research Assistantship								
Yes	74	38.2	57	62.0	359	53.8	19.92**	2
No	119	61.3	35	38.0	298	44.7		
No Response	1	.5	0	0.0	10	1.5		
	194	100	92	100	667	100		
Applied for Administrative Assistantship								
Yes	20	10.3	7	7.6	67	37.6	5.05	2
No	173	89.2	84	91.3	587	60.4		
No Response	1	.5	1	1.1	13	2.0		
	194	100	92	100	667	100		
Received an Administrative Assistantship								
Yes	18	9.3	5	5.4	51	7.6	1.27	2
No	175	90.2	86	93.5	601	90.1		
No Response	1	.5	1	1.1	15	2.3		
	194	100	92	100	467	100		
Applied for Tuition Waiver								
Yes	57	29.4	34	37.0	251	10.5	9.08*	2
No	136	70.1	58	63.0	403	87.7		
No Response	1	.5	0	0.0	13	1.8		
	194	100	92	100	667	100		
Received Tuition Waiver								
Yes	59	30.4	35	38.0	263	39.4	5.88	2
No	134	69.1	57	62.0	391	58.6		
No Response	1	.5	0	0.0	13	2.0		
	194	100	92	100	667	100		
Applied for Other University Support								
Yes	35	18.0	8	8.7	70	10.5	9.08*	2
No	156	80.4	82	89.1	585	87.7		
No Response	3	1.6	2	2.2	12	1.8		
	194	100	92	100	667	100		
Received Other University Support								
Yes	26	13.4	8	8.7	52	7.8	5.67	2
No	165	85.1	83	90.2	601	90.1		
No Response	3	1.5	1	1.1	14	2.1		
	194	100	92	100	667	100		

* Significant at the .05 level.
** Significant at the .01 level.
[a]Chi-square calculations do not include the no response category.

A larger percentage of Black and Hispanic students applied for and received loans and fellowships to support their doctoral education. About 32 percent of Hispanic, 26 percent of Black, and 15 percent of White students applied for loans. Of those who applied, 32 percent of Hispanic, 23 percent of Black, and 15 percent of White students received loans. Table 6 also reveals that more than 42 percent of the Black and about 45 percent of the Hispanic doctoral students applied for grants and fellowships — almost twice the rate for Whites (24 percent). Among those applicants, Hispanics were more likely than both Blacks and Whites to receive grants or fellowships. The majority of Hispanic (64 percent) and White (55 percent) students applied for teaching or research assistantships, compared to fewer than half of the Black students (45 percent). Moreover, a majority of the Hispanic (62 percent) and White (54 percent) students actually received teaching or research assistantships, compared to only 38 percent of the Black students. Both the White and Hispanic students received teaching or research assistantships in somewhat the same proportion as they applied for them; the Black students were significantly less likely to do so.

Other factors contributing to receipt of doctoral fellowships and assistantships were high SES backgrounds, high undergraduate debt, high UGPAs, and being male rather than female. Because graduate fellowships and assistantships are typically awarded by criteria other than need, it is not surprising that the students with higher UGPAs were more often recipients. The positive relationships of SES, undergraduate debt, and gender, however, are somewhat surprising and cannot be explained from the data available in this study. Perhaps students who had relatively high indebtedness or who were male applied for these awards more often than students who carried relatively little debt or who were female.

Doctoral Program Outcomes

Grade-Point Averages

The doctoral grade-point averages of the White students were the highest among the three groups at an A- level (about 3.76 on a 4.0 scale), compared to a B+ level (3.66) for Hispanic and slightly below a B+ level (3.53) for Black students. In addition to having DGPAs significantly below those of White students, Black students were more than twice as likely as White and Hispanic students to be near or below the DGPA needed to qualify for a doctoral degree. Slightly more than 9 percent of the Black students, compared to 4.4 percent of the Hispanic and 4 percent of the White students, were either at or below the B minimum required for graduation.

Satisfaction with Doctoral Program

Black students were significantly more satisfied with their doctoral programs than both the White students and the Hispanic students; Hispanic students were more satisfied than their White counterparts. Students most satisfied with their doctoral programs were those who (1) felt that their institutions were the least discriminatory, (2) felt they had the greatest amount of support and encouragement from a mentor, (3) had the greatest amount of interaction with faculty, and (4) took more time off between undergraduate school and graduate school.

DISCUSSION AND CONCLUSION

The research presented in this report is intended to make progress toward describing the backgrounds, experiences, and performance of Black, Hispanic, and White doctoral students during their transition from undergraduate school to a doctoral program and to assess the factors related to their experiences, performance, and satisfaction in their doctoral programs. The summary of the literature presented in the first part of the report reveals that the information presently available is very limited with respect to describing ethnic/racial differences and with respect to providing models for examining the factors that predict entry into, and experiences and performance while enrolled in, doctoral programs.

The survey revealed many racial group differences in the backgrounds, experiences, and performance of the students, and many differences in their experiences in graduate school even after controlling for personal and educational backgrounds. Furthermore, *the personal and educational backgrounds of the Black and Hispanic students were as different from each other as they were from those of the White students.*

Aside from being members of a minority group, the Black and Hispanic students had very little in common. The Hispanic students were found to be in a better position than their Black counterparts, especially in ways that lead to easier transitions into doctoral programs and better experiences after enrolling. For example, as a group, Hispanic doctoral students were from higher SES backgrounds, received higher grades in undergraduate school, attended more selective undergraduate institutions, and were more likely to major in the sciences in undergraduate school. These characteristics, regardless of race, were all found to be related to students' more immediate transition into graduate school, more positive graduate school experiences, and higher grades in doctoral programs.

Compared to the Black students, Hispanic students were less reliant on personal resources to support their graduate education and more likely to receive graduate teaching and research assistantships. They were more often full-time students and science majors in graduate school and also had greater interaction with faculty. Even after controlling for personal and undergraduate educational backgrounds, the study found that Hispanic students were still more likely to receive graduate teaching and research assistantships and devote more time to studying than both Black and White students. Hispanic students were also more likely than Black students to be science majors in graduate school and to have more frequent interactions with faculty. Even though Black and Hispanic students reported receiving lower DGPAs than White students and had stronger feelings that their institutions were racially discriminatory, Hispanic students had higher grades on the average than Black students, and significantly fewer of them felt that their universities were racially discriminatory.

Compared to the Hispanic and White students, the Black students came from the poorest SES backgrounds, received their baccalaureate degrees from the least selective undergraduate institutions, and received the lowest grades in both their undergraduate and doctoral programs. They were also far less likely to be graduate research and teaching assistants, were more reliant on personal resources and loans to support the majority of their doctoral program expenses, and had greater feelings that their graduate institutions were racially discriminatory.

While the lower SES background and undergraduate preparation of Black doctoral students accounted for some of the difficulties they experienced in making the transition from undergraduate to graduate school and in their graduate school experiences, improvement in these factors does not offer much promise of eliminating these gaps. In fact, such improvement seems somewhat less likely to eliminate the differences between Black and Hispanic students than to eliminate the gaps between Black and White students. For example, of the Black, Hispanic, and White students with similar SES backgrounds and undergraduate preparation, Black students still were less likely than Hispanic students to receive fellowships, less likely to be science majors in graduate school, had less frequent interaction with faculty, and were likely to have lower DGPAs. By contrast, when Black and White students had similar personal backgrounds and undergraduate preparation, the Black students did not fare as well as White students in two areas: They perceived their institutions to be more racially discriminatory, and they received lower DGPAs. However, Black students were more likely than White students to feel that their mentors were very supportive and were satisfied with their doctoral programs.

The differences found between the Black, Hispanic, and White students in this study suggest that graduate institutions may need to have different programs, policies, and strategies to address the unique characteristics and experiences of different minority groups rather than trying to serve them all as if they have identical needs.

In essence, Black doctoral students appear to have the greatest need for intervention of the three groups, and much of the intervention needs to focus on strengthening their undergraduate preparation and providing more teaching and research assistantships to reduce their reliance on personal resources to support their graduate education. In addition to providing needed financial assistance, graduate fellowships and assistantships are also important because they are related to the amount of interaction students have with faculty, which in turn is related to their DGPAs and their satisfaction with their doctoral programs.

While increasing the number of Black and Hispanic students enrolling in and graduating from doctoral programs is an important priority for graduate schools in the United States, it is equally important for graduate institutions to ensure that those admitted have received adequate preparation in undergraduate school, will make smooth transitions into their doctoral programs, will have positive experiences, and will achieve high performance in and satisfaction with their doctoral programs.

Other efforts by graduate institutions to help alleviate feelings of racial difference among students should focus on reducing the feelings of Black and Hispanic students that their universities are racially discriminatory and the situations that give rise to these feelings. Given the research literature that describes Black graduate students in predominantly White institutions as being alienated and relatively dissatisfied with their graduate institutions, it was somewhat surprising to find that both minority groups were more satisfied with their doctoral programs than White students and were equally as likely to have a mentor and to feel that their mentors provided adequate support.

On the basis of prior research, it was also surprising to find that, in addition to race, SES and gender were significant predictors of students' transitions from undergraduate to graduate school, even after the study controlled for their undergraduate preparation. For example, students with high SES backgrounds took less time off between undergraduate and graduate school, had greater social involvement in graduate school, and had more frequent interaction with faculty. Female students took more time off and felt more strongly than male students that their universities were discriminatory. Therefore, in addition to developing policies and strategies for minority students, universities may also need to direct some of their attention toward reducing the amount of time that lower SES and female students take off between undergraduate and graduate school and toward improving the social involvement and the amount of interaction with faculty that lower SES students have, even when their undergraduate preparation is equal to that of their relatively high SES counterparts. In other words, SES and gender, as well as race and ethnicity, should not be impediments to access and equality in graduate education.

The fact that female students, like Black and Hispanic students, felt more strongly than White male students that their institutions were discriminatory is also very interesting, especially since the measure of racial discrimination did not measure gender discrimination.

A better understanding of the overall educational experience of Black, Hispanic, and female graduate students by faculty and administrators and greater interaction between these groups may help alleviate some of the perceptions of discrimination.

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