

Journal of Student Financial Aid

Volume 29 | Issue 2

Article 2

7-1-1999

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Louise S. Kaltenbaugh

Edward P. St. John

Johnny B. Starkey

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Kaltenbaugh, Louise S.; St. John, Edward P.; and Starkey, Johnny B. (1999) "What Difference Does Tuition Make? An Analysis of Ethnic Differences in Persistence," *Journal of Student Financial Aid*: Vol. 29 : Iss. 2 , Article 2.
Available at: <https://ir.library.louisville.edu/jsfa/vol29/iss2/2>

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What Difference Does Tuition Make? An Analysis of Ethnic Differences in Persistence

By Louise S. Kaltenbaugh,
Edward P. St. John, and
Johnny B. Starkey

Louise S. Kaltenbaugh is Assistant Professor of Education at Southern University at New Orleans. Edward P. St. John is Professor of Higher Education at Indiana University. Johnny B. Starkey is a dental student at Louisiana State University School of Dentistry.

During the past two decades tuition charges have climbed faster than inflation while the federal investment in student grants has declined. There is reason to question whether this new financial environment is more problematic for African Americans as compared to European Americans. This study examines the effects of tuition and student aid on persistence by European American and African American college students. We found that differences in student price response to tuition helps explain differences in persistence rates for African Americans compared to European Americans.

What difference does it make if tuition increases and student financial aid does not? Given the recent critiques of federal student aid it might be reasonable to conclude that tuition does not make a difference. Indeed, enrollments rose faster than expected in the 1980s when grants declined. In the early 1990s, college enrollments continued to grow faster than would be predicted when net-price assumptions are used to analyze enrollment trends (St. John, 1994). Given these trends, it is not surprising that McPherson and Schapiro (1998) recently concluded that increasing tuition charges did not influence enrollment by middle-income students. However, the world of student choice is not so simple as is assumed in the logic of net price. There is a workable alternative perspective (e.g., Dresch, 1975), which is not only more sound theoretically and empirically (St. John & Starkey, 1995), but which also explains these apparent incongruities. Indeed, there is substantial evidence that students from less financially advantaged backgrounds are negatively influenced by the high-tuition, low-grant environment of the late 1980s (St. John, Paulsen, & Starkey, 1996).

African Americans are more likely to be from poor families, and are also more price responsive in enrollment than European Americans (St. John, 1991). Therefore, it is appropriate to examine differences in price responsiveness in persistence decisions by African Americans compared to European Americans. In analyzing the relationship between tuition and persistence for African American and European American students, this paper addresses two questions:

- 1) Are there differences in the ways African American and European American students respond to prices and price subsidies?
- 2) If there are differences in price response for African Americans and European Americans, does the price response help explain differences in persistence rates?

This analysis of persistence by African Americans and European Americans of traditional college age uses the National Postsecondary Student Aid Study of 1987 (NPSAS:87), an appropriate data base for assessing the effects of prices and price subsidies on within-year persistence. Our study adapts a logistic regression model developed originally by St. John, Andrieu, Oescher, and Starkey (1994) to include students in both two- and four-year institutions, and to examine separately African American and European American students. Below we briefly describe the model, compare the two populations, present the results of the logistic analyses, and consider our two research questions.

Methods

The model views within-year persistence as a function of social background, high school experience, financial background, institutional characteristics, college experiences, aspirations, and prices and price subsidies (St. John, Andrieu, Oescher, & Starkey, 1994). We used logistic regression, an approach that is appropriate for the study of persistence (Cabrera, 1994). The variables related to each factor are summarized below.

- The model included eight variables related to *social background*. Ethnicity was not specified as a variable because it was used to identify two subpopulations. To control for gender, males (coded as "1") were compared to females (coded as "0"). Mother's education was treated as a set of five design variables: students whose mothers had less than a high school education, some college, a college degree, a master's degree, and an advanced degree were compared to students whose mother had a high school education only. Age was coded as a continuous variable. Married students (coded as "1") were compared to nonmarried students (coded as "0").
- A set of design variables was created for *high school experience*.¹ Students with GED certificates and those who had not completed high school were compared to students with high school diplomas. This set of variables is not entirely adequate for high school but it was the best available. (Information on high school grades or on achievement tests in high school was not included in NPSAS:87. St. John, Paulsen, and Starkey (1996) discussed the implications of this issue in depth.) Nevertheless, given that the effects of high school achievement and college achievement on persistence are highly interrelated, this limited information on high school experience is adequate to measure the effects of aid.
- Five variables related to *financial background* were included. Working students were compared to students who did not work. Students who were independent financial aid appli-

¹ Information on high school grades or on achievement tests in high school was not included in NPSAS:87. The implications of this issue have been discussed in depth elsewhere (St. John, Paulsen, and Starkey, 1996).

“To the extent that student aid policies distinguish by economic class, they also distinguish by ethnicity.”

cants were compared to other students. Family income was coded as a set of design variables: students from families earning \$11,000 or less, earning \$30,001 to \$60,000, and earning \$60,001 or more were compared to students from families earning between \$11,001 and \$30,000.

- Two variables related to *institutional characteristics* were included. Students attending private colleges (coded as “1”) were compared to students attending public colleges (coded as “0”). Students attending two-year colleges (coded as “1”) were compared to students attending senior institutions (coded as “0”).²
- Seven variables related to *college experience* were included. Students who attended full-time (coded as “1”) were compared to those attending part-time (coded as “0”). Year in college was coded as a design set: sophomores, juniors, and seniors were compared to freshmen. Grade-point average was also recoded as a design set: students receiving less than a C average (below 2.0), a C average (2.0-2.99), and an A average (4.0) are compared to students with a B average (3.0-3.9).³
- *Aspirations* were coded into a set of design variables. Students with vocational aspirations (rather than aspiring to a college degree) and those who aspired to attain some college, master’s, and advanced degrees were compared to students who aspired to attain four-year college degrees. Students who aspired to at least some college or higher were not classified as having vocational aspirations.
- There were four variables related to *prices and subsidies*. Tuition charges, grant amount, loan amount, and work amount were divided by 1,000. This provided a basis for measuring student price response.

This basic model and its limitations have been discussed previously (St. John, Andrieu, Oescher, & Starkey, 1994). It represents an appropriate use of an extant database. Although it does not include all variables that are desirable in a comprehensive model of persistence, it does include sufficient variables to assess the effects of prices and price subsidies on persistence.

One new caveat merits mention. Recently, the model used in our study was improved substantially by the development of a model for examining the nexus between college choice and persistence (St. John, Paulsen, and Starkey, 1996). Although this newer version of the model explains more variability in persistence, it also requires more elaboration and takes substantially more space to present and explain the results. Given that

² Institutional selectivity measures are not included in NPSAS:87. Therefore our ability to further distinguish among institutions was limited.

³ We use these terms “A average” and “B average” to simplify the text. When we use the term “B average” we mean any B average (between 3.0 and 3.9); the term “A average” refers only to an absolute 4.0.

Comparison of Populations

we could examine the direct effects of the amounts of tuition and student aid through the simpler version of the model, we decided to stay with the simpler, more straightforward approach in this analysis.

In this study, traditional college-age students were defined as being less than 23 years of age. This restriction was made because so many previous studies had used longitudinal databases that had been restricted to traditional college-age students (e.g., Astin, 1975, and Terkla, 1985). Table 1 compares the two populations, and noteworthy comparisons are indicated below, but no attempt is made to indicate statistical significance.⁴

There were substantial differences in the social and economic backgrounds of the two populations. Smaller percentages of African American college students than European American students were males, had parents with college or more advanced degrees, and were married. These differences are consistent with social class differences for the two populations.

There were only modest differences in high school experience variables. Very small percentages of both populations had received GEDs or had not completed high school. However, there were substantial differences in the income levels of the two populations. Over a third of the African American students were from families earning \$11,000 or less, while only one-ninth of the European Americans were from this income category. In contrast, more than half of the European Americans were from families with incomes \$30,000 or higher, while about a quarter of the African Americans were from families in these higher income categories. Clearly there are major differences in the financial means of the two populations. Therefore, to the extent that student aid policies distinguish by economic class, they also distinguish by ethnicity. The percentages who were employed and who were independent were similar.

There were small differences in the pattern of college experiences.⁵ A slightly higher percentage of European Americans attended private colleges, while a slightly higher percentage of African Americans attended two-year colleges.

There were also a few differences in the college experiences. A smaller percentage of African Americans were full-time students; a larger percentage were first-year students; and a higher percentage had low grades. These indicators of being at

⁴ We did not develop significance estimates because we are not testing a hypothesis related to differences across races. Rather, our intent is to examine whether tuition has different effects on persistence for African Americans than for European Americans.

⁵ In NPSAS:87, there were 42,793 for whom there were data on both ethnicity and institutional type (Byce, 1993); 20,883 were in public institutions; 18,022 in private colleges and 3,888 in proprietary schools. Therefore, the percentages of students enrolled in private colleges (44.5% of African Americans and 48.3% of European Americans in Table 1) are consistent with the population sample.

TABLE 1
Comparison of Traditional-Age
European American and African American Students

Factor/Variable	European Americans mean/percentage	African Americans mean/percentage
Social Background		
Male	47.6%	37.5%
Mother's education		
Less than high school	6.0%	14.6%
Some college	24.9%	23.7%
College degree	21.1%	10.2%
Master's degree	9.9%	5.7%
Age	19.8 years	19.7 years
Married	3.6%	1.5%
High School Experience		
GED	0.7%	1.0%
No high school diploma	1.6%	2.4%
Financial Background		
Working	53.3%	50.5%
Independent	4.6%	6.4%
Total family income *		
\$11,000 or less	11.1%	34.3%
\$30,000-\$60,000	44.1%	22.8%
above \$60,000	19.9%	5.4%
Institutional Characteristics		
Private	48.3%	44.5%
Two-year	15.4%	17.7%
College Experiences		
Full-time attendance	90.7%	87.0%
Year in college		
Sophomore	27.2%	29.6%
Junior	20.5%	18.5%
Senior	16.4%	12.6%
Grade point averages		
Less than C	6.7%	14.4%
C average	34.2%	37.8%
A average	1.9%	0.8%
Aspirations		
Vocational school	2.0%	2.0%
Some college	5.5%	6.6%
Master's degree	35.2%	35.5%
Advanced degree	15.0%	18.4%
Prices		
Tuition amount	\$3,549.72	\$2,986.49
Grant amount	\$1,344.54	\$2,464.97
Loan amount	\$ 884.45	\$1,057.58
Work-study amount	\$ 119.72	\$ 235.44

(Continued on following page.)

TABLE 1
Comparison of Traditional-Age
European American and African American Students (cont.)

Factor/Variable	European Americans mean/percentage	African Americans mean/percentage
Baseline P	94.3%	91.6%
n=	16,089	1,433
Nonpersisters	917	120

* Income is for parent(s), if the student is dependent, or for student (and spouse) if the student is independent.

more risk of dropping out are consistent with lower persistence rates for African Americans.

However, it is interesting to note that African Americans had higher aspirations: a larger percentage planned to attain advanced degrees. These differences are slight and may not be statistically significant. However, this may still be important because aspirations have a substantial influence on year-to-year persistence (St. John, 1989).

There were substantial differences in finance-related variables. African Americans paid less tuition, indicating they attended less expensive colleges. However, they had substantially higher average grant awards, indicating they had higher financial need. While differences between loans and work were less substantial, African Americans received more of all types of financial aid on average.

Logistic Analyses

We used logistic regressions to examine persistence by both populations. We present two model indicators (a pseudo R^2 and a Somer's D) for each model, as well as Delta-P statistics for the independent variables. The Delta-P provides an indicator of the change in probability associated with a change of one increment in the independent variable (Cabrera, 1994). Table 2 shows the logistic regression analyses of the two populations. In the following summary we discuss the significant variables, focusing on both similarities and differences across the two populations.

Among European Americans, males were more likely to persist, but this variable was not statistically significant for African Americans. We suspect that social and cultural differences between European American and African American families explain this difference. This difference merits further examination.

No variables related to mother's education were significant for either population. This is an interesting development. Earlier analyses of this data base that have combined students from all ethnic groups have found that parents from families

TABLE 2
The Effects of Prices on Within-Year Persistence by
European Americans and African Americans:
Logistic Regression Analyses of Traditional College-Age Students

Factor/Variable	European Americans		African Americans	
	<u>Delta-P</u>	<u>Significance</u>	<u>Delta-P</u>	<u>Significance</u>
Social Background				
Male	0.0091	.01	0.0116	
Mother's education				
Less than high school	-0.0051		-0.0235	
Some college	-0.0051		-0.0295	
College degree	-0.0019		-0.0152	
Master's degree	0.0101		-0.0368	
Advanced degree	0.0061		-0.0324	
Age	0.0022		0.0175	.01
Marital status				
Married	0.0153	.05	0.0119	
High School Experience				
GED	0.0378	.01	0.0099	
No high school degree	0.0011			
Financial Background				
Working	0.0120	.01	0.0175	.01
Independent	-0.0072		0.0103	
Income*				
\$11,000 or less	0.0059		-0.0105	
\$30,000-\$60,000	-0.0036		-0.0421	
above \$60,000	-0.0055		0.0165	
Institutional Characteristics				
Private	0.0427	.01	0.0687	.01
Two-year	-0.0168	.01	-0.0177	
College Experiences				
Full-time attendance	-0.0269	.01	-0.0213	
Year in college				
Sophomore	-0.0090	.05	0.0226	
Junior	-0.0105		-0.0421	
Senior	-0.0342	.01	-0.0563	.05
GPA				
Less than C	0.0315	.01	0.0272	
C average	-0.0089	.05	-0.0290	
A average	-0.0243		0.0083	
Aspirations				
Vocational	0.0196	.01	-0.0010	
Some college	0.0208	.01	0.0081	
Master's degree	-0.0185	.01	-0.0034	
Advanced degree	-0.0138	.05	-0.0216	
Prices				
Tuition amount	-0.0273	.01	-0.0425	.01
Grant amount	-0.0020		-0.0124	.05
Loan amount	-0.0039	.05	0.0104	
Work-study amount	-0.0166	.01	-0.0492	.05

(Continued on following page.)

TABLE 2
The Effects of Prices on Within-Year Persistence by
European Americans and African Americans:
Logistic Regression Analyses of Traditional College-Age Students (cont.)

Factor/Variable	European Americans <u>Delta-P</u>	African Americans <u>Delta-P</u>
Baseline P	94.3%	91.6%
-2 Log L:	5584.547	636.337
Somer's D	0.680	0.692
Model n=	16089	1433
Pseudo R ²	0.207	0.233
df	32	32

* Income is for parent(s), if the student is dependent, or for student (and spouse) if the student is independent.

with mothers who have advanced degrees were more likely to drop out (St. John, Andrieu, Oescher, & Starkey, 1994; St. John, Paulsen, & Starkey, 1996). Age was positively associated with persistence for African Americans, but not for European Americans. For European Americans, each year of age increased the probability of re-enrolling by only about .22 percentage points. For African Americans, each year of age increased the probability of re-enrolling by about 1.75 percentage points. This difference in the significance of age for the two ethnic groups merits further exploration.

European Americans with GED degrees were more likely to persist than high school graduates; this variable was not significant for African Americans. The possible reasons for this difference are not readily apparent. However, GED students have also been found to persist better than high school graduates in community colleges (St. John & Starkey, 1996).

Working while in college was significant and positively associated with persistence for both African Americans and European Americans. It is possible that working has a positive influence in part because earnings from work helped the students overcome the inadequacy of other resources. The inadequacy of student aid is evident from the analysis to be described later in this paper.

Attending a private college was positively associated with persistence by both populations. This is consistent with previous studies of students enrolled in four-year colleges using NPSAS:87 (St. John, Andrieu, Oescher, & Starkey, 1994; St. John, Oescher, & Andrieu, 1992; St. John, Paulsen, & Starkey, 1996).

College grades had an influence on persistence by European American students, but not on African American students. For European Americans, having a grade point average below C improved the probability of persistence as compared to having a

“...Providing adequate student aid relative to the costs of attending is a vitally important policy goal, especially if American society still intends to promote equal opportunity.”

B average.⁶ Further, European Americans with C averages were less likely than students with B averages to persist. This pattern for European Americans is consistent with other analyses of this data set (St. John, Andrieu, Oescher, & Starkey, 1994; St. John, Paulsen, & Starkey, 1996). These differences merit further exploration.

Year in college influenced persistence for both groups. Seniors were less likely to persist than freshmen for both groups. These findings are consistent with prior research using NPSAS:87 (e.g., St. John, Andrieu, Oescher, & Starkey, 1994). Being a sophomore was negatively associated with persistence by European Americans but not African Americans.

For European Americans, aspiring to less than a four-year degree (some college or vocational) was positively associated with persistence, while having longer term aspirations was negatively associated with persistence, consistent with prior studies of students in four-year colleges (St. John, Paulsen, & Starkey, 1996). However, for African Americans, the aspiration variables were not significant.

What explains these differences in the influence of aspirations? For European Americans there seems to be one set of incentives to persist within-year (i.e., continuing enrollment to meet short-term goals), and another set of incentives for persistence to degree aims (continuous enrollment is not so important). For African Americans, these patterns do not hold: continuous enrollment seems more consistently important for African Americans, at least for those who can afford it. This complements previous research, which has found that African-American college applicants had higher goals relative to their high school achievement (St. John, 1991). Indeed, both sets of findings indicate that educational aspirations have a different, perhaps more immediate meaning for African Americans. Apparently, dropping out holds a greater risk of not being able to re-enroll for African-American college students. This issue merits further exploration.

Tuition is negatively associated with persistence for both African Americans and European Americans. For African Americans, each thousand dollars of tuition differential reduced the probability of persistence by 4.25 percentage points, while for European Americans each thousand dollars of tuition differential reduced the probability of persistence by 2.73 percentage points. Clearly there is a difference in price response, but what does it mean? This issue, which is the central focus of this paper, is explored in the concluding segments of this article.

Student aid was negatively associated with persistence by both African Americans and European Americans. For Euro-

⁶ This could be related to institutional policies that make it more difficult for students to re-enroll if they previously withdrew while holding a low GPA (St. John, Andrieu, Oescher, and Starkey, 1994).

**What Difference
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pean Americans, loans and work-study were negatively associated with persistence, while for African Americans, grant aid was negatively associated with persistence. Recent studies (St. John, Paulsen, & Starkey, 1996; St. John & Starkey, 1996) confirm empirically that negative coefficients for financial aid are appropriately interpreted as meaning financial aid was inadequate for both populations in 1986-87.⁷

There is more than a little irony to these findings. There is growing evidence that middle-income students use loans for college choice, i.e., to buy their way into more expensive colleges than they could otherwise afford (St. John, Oescher, & Andrieu, 1992) and it is becoming increasingly evident that some are reflecting critically on these choices, comparing their actual experiences (what they get) to the reasons they chose the college in the first place (St. John, Paulsen, & Starkey, 1996). This helps explain the negative influence of debt on persistence for European Americans (Table 2). In contrast, African Americans are taking out more loans to attend less expensive colleges. Thus, they are buying access. Further, despite their higher loan burdens, loans are not negatively associated with persistence for African Americans, a phenomenon that is closely linked to affordability (St. John, Paulsen, & Starkey, 1996; St. John & Starkey, 1996).

Clearly there are differences in price response for the two populations: African Americans are substantially more responsive to tuition than European Americans. We conclude that providing adequate student aid relative to the costs of attending is a vitally important policy goal, especially if American society still intends to promote equal opportunity. While there appears to have been some increase in federal grants and minority enrollment in the early 1990s (St. John, Hu, Clements, Asker, & Weber, 1999), the policy debates about funding federal grant programs may not give adequate attention to this important issue.

⁷ For a more complete explanation of this concept of adequacy and an empirical proof of it, see St. John, Paulsen, & Starkey (1996).

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