

8-31-2023

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Recommended Citation

Thomas, D., Landy-Blacklock, S., Davis, J. D., Poats, L., Davis, R., & Brown-Fisher, D. (2023). The Predictable Relationship between Demographic Factors and Persistence of First-Year Students at a Historically Black College & University. *The Journal of the Research Association of Minority Professors*, 25(2). Retrieved from <https://digitalcommons.pvamu.edu/jramp/vol25/iss2/3>

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The Predictable Relationship between Demographic Factors and Persistence of First-Year Students at a Historically Black College & University

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Introduction

In the first year of college, persistence and progression rates are significant concerns. Higher education leaders and scholars must examine differences in persistence rates among students from different demographic backgrounds and implement strategies to increase the likelihood of persistence. Based on American College Testing Program (ACT) statistics from 2011, it appears that 25% of first-year students at four-year colleges did not return for their sophomore year (ACT, 2011). A challenge faced by higher education administrators is student persistence and progression. Colleges and universities assigned significant financial, administrative, and human resources to promote the student persistence rate which was an indicator of institutional effectiveness aligned with accreditation credentials, stakeholders support, and federal grants (Millea et al., 2018).

Researchers almost two decades ago found that ethnicity was associated with student persistence rates, consistent with Stewart et al. (2015)'s findings. In Maynard's (2020) study, first-time college students over 16 years and their part-time enrollment status were found to progress at different rates based on their gender. Over 16 years, Maynard (2020) found that male and female persistence rates for first-time college students changed by 3.97 percentage points. For colleges and universities to succeed in retaining incoming freshmen and helping them to matriculate, they must gain insight into how to retain them. In addition to universities' academic support programs and their financial resources, colleges and universities will offer various types of support to freshmen based on their characteristics (Huyge et al., 2015).

College student persistence research has evolved over time, and scholars have noted students from less socioeconomically privileged backgrounds have a greater tendency to leave

college before graduation. In addition to those from traditionally underrepresented racial groups and those who are the first in their families to attend college, students from economically disadvantaged backgrounds are more likely to drop out of college before graduation; however, economic backgrounds are important predictors of persistence (Reason, 2009). Accordingly, ethnicity and socioeconomic status have been shown to be significant independent predictors of academic achievement and persistence rates among freshman college students (Bailey & Dynarski, 2011; Blanden, 2013).

Purpose of the Study

The purpose of this study was to examine the relationship and predictability of demographic factors, on the persistence rates among first-year, full-time, four-year degree-seeking students at a Historically Black College and University. Specifically, this study focused on the predictive power of demographic factors (gender, ethnicity, and SES), on the persistence rates among first-year, full-time, four-year degree-seeking students attending a Historically Black College and University. Thus, it can be hypothesized that the demographic factors of gender, ethnicity, and SES have some predictive power with regard to persistence rates among first-year, full-time, four-year degree-seeking students.

Based on the above purpose, the following research hypotheses were generated:

H₁: There is a statistically significant relationship between demographic factors (gender, ethnicity, and socio-economic status) and persistence rates of first-year, full-time, four-year degree-seeking students at a Historically Black College and University.

Theoretical Framework

According to Tinto's (1993) theory of student departure, university professionals may have an impact on student integration. Tinto's (2006b) updated theory includes academic advisors as key components of students' academic integration. Persistence and retention can be improved by increasing students' academic engagement (Tinto, 1993). Through their professional relationship with a student, advisors can facilitate student integration (Tinto, 2006a). Consequently, student persistence is determined by these interactions between the student and the advisor, not necessarily by the theory of advising applied. Tinto (1975, 1993) argued that students who struggle academically may succeed if they can integrate into colleges. As Tinto (2017) proposed, universities need to think about how they can motivate and ensure that their students complete their degrees to fully comprehend the attrition problem. He asserted that from the perspective of students, it is not a matter of 'being retained', but of remaining until the degree is complete (p. 2). Students who are persistent achieve a program of study by maintaining focus, perseverance, and forward progress (York, Gibson, & Rankin, 2015). For students to persist in the face of academic struggles, they must perceive the value of the curriculum, perceive that they are part of a team, and feel self-efficient (Tinto, 2017).

Operationalization of Variables

In the interest of clarity, the following variables/terms are operationally defined for this investigation.

Degree-seeking refers to students enrolled in courses for credit that are recognized by the institution as leading to a four-year degree.

Ethnicity refers to whether a student is African American, Caucasian, Hispanic American, Asian American, or other American.

First-time, first-year (freshman) student refers to a student attending a higher education institution for the first time at the undergraduate level.

Full-time Student refers to an undergraduate student that is enrolled in 12 or more credits per semester.

Gender- refers to whether a student is male or female.

Historically Black Colleges and Universities: Institutions of higher education created to educate Black Americans.

Persistence Rate refers to student enrollment at the university from the fall semester to the spring and fall of the next year.

Socioeconomic Status (SES) refers to whether or not a student is eligible for a Pell Grant or a subsidized Stafford Loan based on income.

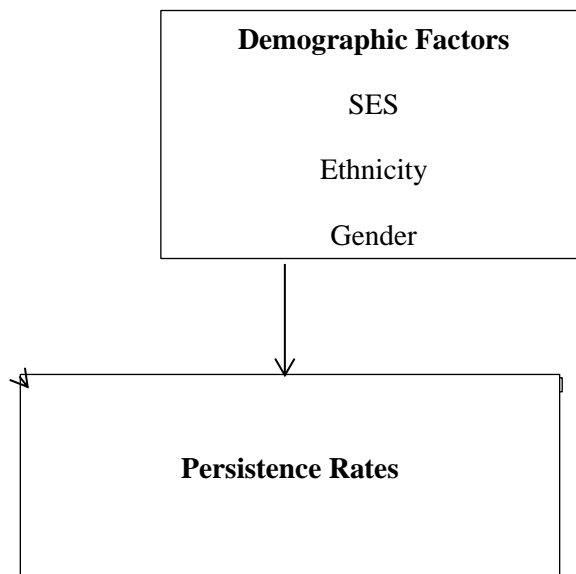
Methodology

The study approached the research questions from a correlational research design perspective (See Figure 1). This type of research design was the most appropriate for this study because the researcher examined the predictable relationship between two or more predictor variables and one criterion variable (Babbie, 2014). This approach is centered on gathering statistical data. Further, this type of research method enables the researcher the opportunity to analyze the linear combination effects of the predictor variables on the criterion variable (Gay, L., Mills, G., & Airasian, P. (2016). Moreover, Gay et al. (2016) opined that the correlational research design is sometimes treated as a descriptive research design, primarily because it describes an existing condition among variables. Finally, according to Warner (2013), the correlational research design provides the researcher with mathematical equations to explain the

statistical power of the independent variables on the dependent variable. This type of research recognizes trends and patterns in data, but it does not go so far in its analysis to prove causes for these observed patterns. Cause and effect are not the basis of this type of observational research.

Figure 1

Correlational Design Model



Population and Sample

The accessible population of the present study consisted of 5,781 first-time freshmen students who enrolled at the targeted institution of higher learning during the 2017-2020 academic years. The undergraduate population of the university is just under 6,000. Furthermore, the target university is located near the downtown area and covers around 150 acres. Its academic programs consist of eleven schools and colleges. The institution is also a member of the Southern Association of Colleges and Schools Commission on Colleges.

Sampling Procedures

The simple random sampling procedure was employed in the present study. This type of probability sampling procedure allows each member of the accessible population to have an equal chance of being selected for inclusion in the study (Gay et al., 2016). To conduct the random sampling process for this study, the researcher implemented a sampling frame consisting of a list of all first-time, full-time students during fall 2017 to spring 2020 semesters at the target university.

After this phase of the sampling process is completed, the researcher assigned each member a number from 0001 to N, where N is the total number of first-time, full-time college students. Ten percent (10%) of the first-time full-time college students during the above time span were randomly selected employing the table of random numbers.

Data Source

The researcher obtained data from the Office of Institutional Assessment, Planning & Effectiveness. The major functions of this office for the target university are to collect, analyze, and maintain all data regarding students. In addition, this office had the responsibility for disseminating students' information to other units of the university as well as to State and federal agencies.

Further, the Office of Institutional Assessment, Planning and Effectiveness at the target university generated and downloaded the data once the request from the researcher to the Office of General Counsel is reviewed and granted. The target university is mandated under the Open Records Act to develop and maintain a data collection system for its student clientele. The following data were collected from students' records:

- Yearly parameter(s) 2017-2020 Academic School Year
- Demographic Factors
 - o Gender
 - o Ethnicity
 - o Socioeconomic status
- Academic Factors
 - o GPA
 - o Hours passed
- Persistence Rate Data

Data Collection Procedures

The researcher contacted the University's Human Subject Committee for final approval to conduct the study (See Appendix A). In order to obtain the student database needed, the researcher also contacted the University's Legal General Counsel and requested data for the first-time freshmen student population for fall 2017 to spring 2020 (See Appendix B). Relevant records of all freshmen first-time, full-time four-year degree-seeking students that matriculated to the institution for fall 2017, 2018, 2019, and spring 2020 semesters (i.e., high school GPA, number of hours passed) represent the study's target population.

Once the request was granted, the database was provided by the Office of Institutional Assessment, Planning and Effectiveness (See Appendix C) to the researcher, the data were downloaded and recorded by the researcher. After this process, the data were injected into a statistical software package. For analysis purposes, the Statistical Package for the Social Sciences (SPSS) version 27 was used to analyze the data.

Statistical Analysis

The Binary Logistic Regression procedure was used in the current study. Binary logistic regression is a type of regression analysis that is used to estimate the relationship between a dichotomous dependent variable and dichotomous-, interval-, and ratio-level independent variables (Hosmer & Lemeshow, 2000). For a binary response variable y , denote its two categories (Yes or No) by 1 and 0, commonly referred to as success and failure (Agresti, 2018).

Data Analysis

Demographics

There were 462 first-year, full-time, four-year degree-seeking students who participated in this empirical investigation.

Gender

There were one hundred eighty or 39 percent of first-time college students who identified as male. In contrast, there were 282 or 61 percent of first-time college students who identified as female. See Table 1 for these results.

Table 1

Demographic Characteristics of Participants

Variable	Number	Percent
Gender		
Male	180	39.0
Female	282	61.0
Ethnicity		

Black	410	88.7
Hispanic	25	5.4
Multiracial	7	1.5
White	6	1.3
Other	14	3.0
Socioeconomic Status		
Received Pell Grant	380	82.3
Did not Receive Pell Grant	82	17.7

Ethnicity

Likewise, there were 410 or 88.7 percent of the first-time, full-time college students who reported their ethnic identity as Black, and 25 or 5.4 percent of them indicated their ethnic background as Hispanic. On the other hand, 7 or 1.5 percent of the college students noted their ethnic status as multiracial and 6 or 1.3 percent of them acknowledge their ethnicity as white. Finally, 14 or 3 percent of the college students revealed their ethnic status was other. See Table 1 for these results.

Socioeconomic Status

In addition, there were 380 or 82.3 percent of first-year, full-time college students received a Pell grant. In comparison, there were 82 or 17.7 percent of first-time, full-time college students who did not receive a Pell grant. See Table 1 for these findings.

Examination of Hypotheses

HO₁: There is no statistically significant relationship between demographic factors (gender, ethnicity, and socioeconomic status) and persistence rates of first-year, full-time, four-year degree-seeking students at a Historically Black College and University.

A binary logistic regression was computed to assess the predictable relationship between demographic factors (gender, ethnicity, and socio-economic status) and the persistence rate among first-year, full-time, four-year degree-seeking students. Regression results revealed that the overall model of the three demographic predictors were statistically reliable in distinguishing those college students who would persist and those college students who would not persist (-2 log likelihood, 180.578, $X^2(3) = 8.114$, $P < .05$). Moreover, according to Nagelkerke R Square, the variables gender, ethnicity, and socioeconomic status, combined accounted for 5.2 percent of the variance in persistence rate. See Table 2 for these results.

Table 2

Overall Model Fit Results Regarding the Relationship between Demographic Factors and Persistence Rates

Model	Chi-Square	df	P
Final	8.114	3	.044*

-2 log likelihood = 180.578, Nagelkerke R Square = .052

*Significant at the 0.5 level

Additionally, the prediction of persistence rate was quite impressive in terms of correctly classifying those first-time, full-time college students who would persist (100%) but not so in terms of those first-time, full-time college students who would not persist (0%). The overall

percentage of cases correctly classified by the model was 94.8 percent. See Table 3 for these findings.

Table 3

Classification Table Results Regarding Persistence Rates

Persistence	Did not Persist	Persisted	Percent Rate
Did not Persist	0	24	0.0
Persist	0	438	100.0

Overall Correct =94.8

Moreover, the Wald Test was employed to measure the individual contribution of each demographic predictor on the persistence rate among first-time, full-time, college students. The Wald test revealed that the variable socioeconomic status ($Z=6.188$, $P</05$) was found to be an independent predictor of persistence rate. Finally, the odds ratio revealed that for every one-unit increase in SES, the odds that first-time, full-time college students would persist decreased by .32 percent. Thus, hypothesis 1 was rejected.

Table 4

Regression Coefficients Regarding the Relationship Between Demographic Factors and Persistence Ratio

Variable	B	SE	Wald	df	P	Exp(B)
Gender	.672	.426	2.486	1	.115	1.958
Ethnicity	.075	.235	.101	1	.750	1.077
SES	-1.153	.463	6.188	1	.013	.316*
Constant	3.229	.898				

*Significant at the .05 level

Discussion

Perhaps, the most interesting finding of the present study was the significant impact the demographic variable socioeconomic status had on the persistence rate among college students, particularly first-time, full-time college students. The variable socioeconomic status was found to be a significant predictor of the persistence rate among first-year college students.

The above finding was consistent with those of Bjorkland-Young (2016), Schelbe et al. (2010), Deangelo and Franke (2016), Roksa and Kinsley (2018), and Zembrodt (2021). All of the aforementioned researchers found that financial support was positively related to students persisting and progressing through college. A plausible explanation for this finding may be that first-year college students, especially those attending Historically Black Colleges and Universities are in need of more institutional support, particularly in terms of finances, such as federal grants, scholarships, and financial aid. Receiving institutional financial support is probably the most important factor to influence first-time college students' decision to persist and progress in school.

Another notable finding and somewhat surprising detail in the study, was the lack of influence of the demographic variable ethnicity on the persistence rates of first-time college students. To be sure, the variable ethnicity was found not to be statistically related to the persistence rates among first-year college students. The finding was not supported by the works of Alvarado (2017), Tollivar, David and Miller (2018), Dulabaum (2016), Nichols, Eberle-Sundre and Welch (2016), Floyd-Peoples (2016), Moragne-Patterson and Barnett (2017) and Strayhorn (2008).

The above researchers found that ethnicity was a significant predictor of persistence rates among first-time college students. A reasonable explanation for the finding may be that regardless of their ethnic background, first-time college students attending Historically Black Colleges and Universities are the ones most likely to develop relationships with their professors than those attending predominantly White higher education institutions. Through this relationship, faculty members are more prone to serve as mentors for these students. Because of the social interaction between students and faculty, first-time students enrolled in predominantly Black colleges and universities are more likely to persist and progress in school.

Moreover, another finding of the present study was the lack of predictive power that the demographic variable gender has on the persistence rate among first-time college students. A significant relationship was not found between gender and persistence rate. This finding was not favorable to those of Strayhorn (2008), Brooms and Davis (2017), Ezelala-Harrison and Ahuja (2018), Ezeala-Harrison (2014) and Pellegrino, J. L., Snyder, C., Crutchfield, N., Curtis, C. M., & Pringle, E. (2015).

Previous research conducted by the researchers listed above, found that the variable gender was statistically significantly related to the persistence rate among college students. A suitable explanation for this finding may be that male and female first-time college students seem to have similar attitudes or perceptions regarding the importance of a college education to their career goals. The attitudes or perceptions held by first-time college students toward predominantly Black colleges and universities are significant in how they perceive the education they are receiving from these institutions. The way they perceive these institutions seems to play a much larger role in their efforts to persist and progress on these campuses.

Another substantial explanation for the gender finding may be the type of academic advising both male and female first-time college students are receiving at predominantly Black college and university campuses. Strong academic advisement is essential in keeping first-time college students, as well as their counterparts, abreast of their academic progress and what is expected of them to remain in school.

Conclusion and Implication

In general, the odds of first-time college students persisting in college were significantly higher when demographic factors of gender, ethnicity, and socioeconomic status were included in the logistic regression model. Data revealed that for every one unit increase in SES, the odds are that a first-time college student would persist decreased by .32 percent. It should be noted, a regression model to correctly predict the persistence rate of first-time college students with a high probability level should include the demographic factors of gender, ethnicity, and SES.

The significant predictable relationship that exists between demographic factors and persistence rate among first-time college students suggests that there is a need on the part of higher education officials to take into account the influence that these variables have on students remaining in school.

It is well documented that the demographic factors of gender, ethnicity, and socioeconomic status have had and are still having a significant impact on the identification of those students who will more likely persist or not, as well as progress or not. Therefore, it is imperative that academic administrators on higher education campuses work closely with student services administrators in developing strategies to help first-time college students, particularly those with financial issues, stay in school and receive their degrees.

Recommendations for Further Study

In order to further extend the findings of this study, the researcher recommends that a study is conducted to examine the impact of students' attitudes and perceptions toward college and how their mental dispositions affect the persistence rates among students across classification levels. Additionally, a study should be conducted to investigate the influence that academic advisement types have on the persistence rates among college students, particularly first-year students.

Moreover, a follow-up study needs to be conducted which will include a large population of first-time, full-time students from various geographic locations across the United States. Furthermore, a future study should also include various gender identities which will provide a more complete and national perspective on the impact of demographic factors on persistence rates among college students.

Finally, a study should be conducted to compare the differences and similarities of those factors that affect the persistence rate of first-time, full-time students attending predominantly Historically Black Colleges and Universities and those attending predominantly White universities.

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