

 THE RESEARCH AGENDA

Postsecondary Intentions of Latino and African American Students in Tennessee: Considerations for Strategic Enrollment Management

By Lorianne D. Mitchell, Edith Seier, and Michael H. Small

The Complete College Tennessee Act (CCTA) established benchmarks for increasing state college completion rates to the national average by 2025. This investigation explored responses on the High School Senior Opinion Survey to identify trends between two subpopulations for strategic enrollment management (SEM)—Latino American and African American students. Findings are discussed within the framework of Astin's (1991; 2012) Input-Environment-Output theory.

Recognizing the important role postsecondary education plays in the United States' ability to maintain its global competitive edge, the Obama administration implemented higher education initiatives with the objective of establishing the United States as the world leader in college graduates (Obama Administration Archives n.d.). Specifically, the goal was to increase the percentage of Americans over the age of 25 with at least an associate's degree (or its equivalent) from approximately 44 percent in 2009 to at least 60 percent by the year 2020. As a result, a coalition of 22 states along with national and philanthropic organizations, including Complete College America, pledged to do their part by setting specific completion goals with stated deadlines.

As one of the states in the coalition, Tennessee passed the Complete College Tennessee Act (CCTA) in 2010, a landmark reform legislation that emphasized the connections between workforce development and higher education. Specifically, the primary goal of the legislation was to increase the number of working-age adults in Tennessee with postsecondary education credentials to the national average by 2025, an equivalent of 210,000 additional degrees (THEC 2021). To accomplish this goal, the legislation required the Tennessee Higher Education Commission (THEC), the state's postsecondary education coordinating board, to accomplish several objectives including develop a new outcomes-based funding formula, which allocated all

non-restricted state support based on student progress and success rather than enrollment (Complete College TN Act of 2010). The CCTA also recommended target “underserved” populations, including Hispanic/Latino American and African American students (terms used by the state and in the survey), as being crucial to Tennessee’s ability to meet its 2025 goal.

Rather than attempt to define race or ethnicity by sociological, anthropological, biological, or other terms, group identifiers used herein are simply those assigned by the referenced source (*i.e.*, Tennessee Higher Education Commission, the U.S. Census, the survey administered) and not the authors’. Participants in the current study self-identified using a Likert-type item (see more about the survey in the “Measures” section below) with a focus on the “African American” and “Hispanic/Latino” groups as compared to the “Caucasian/White” reference group. For brevity and greater inclusivity, “white” will be used in place of “Caucasian/White” and “Latino” will be used in place of “Hispanic/Latino.” In addition, while “Black” may be the more inclusive term to represent numerous groups of African descent, it is not used here because the survey explicitly used the term “African American” and made no reference to “Black.”

Recognized as minority groups in 2010 by the U.S. Census (Humes, Jones, and Ramirez 2011), African Americans and Latino Americans have traditionally been systematically labeled as under-performing against their white counterparts in their rates of college graduation. Overall, approximately 28 percent of Americans in the general population in 2009 aged 25 and older had achieved at least a bachelor’s degree with 11.5 percent being reported by African Americans and 8.7 percent reported by Latino Americans (Ryan and Siebens 2012). Specifically, between 2009 and 2010 whites earned 66.3 percent of associate degrees earned compared to 27.2 percent of degrees earned by African Americans and Latino Americans, combined. Similarly, whites earned 72.9 percent of the bachelor degrees earned in the same time span as compared to 19.1 percent earned by both African Americans and Latino Americans (Aud, *et al.* 2012, 285).

Tennessee reflects the racial and ethnic chasms in college completion seen nationally. In its 2012 *Fact Book*,

THEC reported data that confirmed that while enrollment was steadily increasing for these historically underserved students at two- and four-year institutions in Tennessee, their retention and graduation rates were still considerably lower than their white peers (THEC 2012). In addition, of the spring 2011 graduating class of Tennessee high school students (the population sampled in the current study), relatively fewer African American and Latino American students immediately enrolled in a postsecondary institution (anywhere) in comparison to their white peers. Specifically, while 58.4 percent of white students in Tennessee enrolled in fall 2011 college courses, only 53.3 percent of African American and 34.9 percent of Latino American students pursued the traditional high-school-to-college path of higher education (THEC 2014, Table 3.1). These statistics suggest that while the enrollment and completion rates for these two underserved groups may trend upwards, many African American and Latino American students in Tennessee forego a college education—providing an area for vast improvement.

Researchers in the SEM space (*e.g.*, Pike and Robbins 2016) tout the importance of investigating student characteristics’ impact on college going instead of just focusing on the nature and actions of schools and their programs. Recognizing the positive impact an improvement in the postsecondary school attendance of African American and Latino American students can have in meeting the state and national college completion goals, SEM professionals would benefit from studies such as the present investigation to comprehend the factors that affect students’ decisions to attend postsecondary institutions.

Theoretical Framework

Alexander Astin’s (1991; 2012) Input-Environment-Output (I-E-O) theory of student development is the fitting theoretical framework to guide the investigation due to its appropriateness for assessing the impact of student characteristics on higher education outcomes (Callahan, *et al.* 2017). Astin’s (1991; 2012) I-E-O theory posits that college students’ inputs are important determinants of associated outputs; however, the relationship between inputs (I) and outputs (O) should be examined in the

context of students' college environment (E). Inputs are individual characteristics including race, entrance examination scores, and parents' income. Whereas, characteristics of the college environment, which may help determine outputs, include peer group characteristics, faculty characteristics, and student involvement. Finally, output factors reflect outcomes for the individual and for desired outcomes of higher education programs—which also result from the interaction of input and environmental factors. Output factors include academic achievement, retention, career development, and satisfaction with the college experience (Astin 1991; 2012).

Applied in the higher education research context, I-E-O has been used to frame several investigations of college students, including: first year college students' academic persistence or success (*e.g.*, Ishler and Upcraft 2005), factors affecting how well students transition in college (*e.g.*, Côté and Levine 2000), factors affecting students' success (Long and Amey 1993), and the effect of students' race on intention to attend college (Cabrera 2014) and degree completion rates (Oseguera 2005).

Research Purpose and Question

Although previous investigations explored the between-race differences in college students' outcome, comparatively fewer explored the factors that determine or influence students' interest in college. Therefore, the primary objective of this study was to delve deeper into the issue of college completion by first identifying college-going intentions of two historically underserved populations in Tennessee - African Americans and Latino Americans. Specifically, the motivators or de-motivators that influence African American and Latino American students' decision to pursue a post-secondary degree after high school—hence the focus on the Input aspect of Astin's (1991; 2012) I-E-O theory.

Specifically, this study examined a few of the inputs mentioned in the I-E-O theory: 1) demographics (gender, ethnicity); 2) socio-economic status (household income, work status in high school, and parents' highest level of education); 3) academic preparation (high school GPA, composite ACT score, highest math taken

in high school); and 4) college preparation. To this end, the main research question investigated in the current study is as follows:

What are related factors to Tennessee African American and Latino American students' decisions to pursue a post-secondary degree?

Research Methods

Sampling Methodology

The population from which the study sample was drawn included Tennessee public high school students noted as seniors in the 2010 to 2011 academic year. Due to limitations including those of cost and time, a one stage stratified cluster sample was drawn. To ensure a representative sampling of the 318 public high schools in the state (at the time), schools were first stratified into grand division or region—representing high schools from East, Middle and West Tennessee. Because of the stratified cluster sample, 40 high schools were randomly sampled and 27 responded, a substantial response rate of 68 percent.

Participants

In the 27 randomly sampled schools, 18,566 registered high school seniors completed the *High School Senior Opinion Survey* (including those with missing data on items including race). Of that number, a combined 3,116 (17.8%) self-identified as either African American or Latino American. The largest racial group was white with 12,953 students (73.8%). These data were consistent with reports from the United States Census Bureau (2010) which reported that the racial majority in Tennessee in 2010 (the data sampled for this investigation) was white (77.6 percent), while African Americans and Latino Americans comprised a smaller portion of the state's population (16.7 percent and 4.6 percent, respectively).

Given the focus of this investigation, only the data for the 3,116 African American and Latino American students were used in the analyses. Of this subpopulation, approximately 86 percent (2,677) self-identified as African American, whereas the remaining 14 percent

(439) identified as Latino American. The majority (53.6 percent) self-identified as females; 50.5 percent lived in West Tennessee, 30.6 percent in Middle Tennessee, and only 19 percent in East Tennessee (*see* Table 2). There is a higher concentration of African Americans in West Tennessee and a higher concentration of Latinos in Middle Tennessee. This data is also consistent with the fact that the most racially diverse region of the state is West Tennessee, followed by Middle Tennessee then East Tennessee.

Measure

The *High School Senior Opinion Survey* (hereafter referred to as the survey) is an existing instrument administered by the Tennessee Higher Education Commission (THEC) to capture students' intentions upon graduation from high school. The survey has been administered regularly, typically biennially, since 2000. The 2011 survey captured responses from seniors from 27

public high schools across the state and represented 2011 ACT-tested-seniors for the same year. Therefore, the survey provided a generous, representative sample from which to draw conclusions.

The 2011 survey contained 47 items requiring a combination of both categorical (*e.g.*, Likert type, Yes/No) and continuous (*e.g.*, highest ACT composite score) responses. Questions required respondents to indicate their intended plans after graduating high school, the importance of various factors in their decision to continue their education, and several classifying questions including demographics and previous academic performance in classes and on standardized examinations.

The outcome and predictor variables for the current study are shown in Table 1. The outcome variable is categorical—college going intentions of African Americans and Latino Americans. The ten predictor variables were classified into four theoretical families: 1) demographics—gender, ethnicity; 2) socio-economic status

TABLE 1 ► Outcome and Predictor Variables

Variable	Survey Question	Survey Answer Options	
		Option #	Option/Fill-In
Outcome Variable			
College Going Intentions of African Americans and Latino Americans	What do you plan to do after you finish high school?	1	Go to work full-time
		2	Go to four-year college or university
		3	Go to two-year community college
		4	Go to technical or vocational school
		5	Go into the armed forces
		6	Other
Predictor Variables			
Demographics	Your gender	1	Male
		2	Female
	Your racial or ethnic identification	1	African American
		2	Hispanic / Latino-Latina
		3	Asian American or Pacific Islander
		4	Caucasian / White
		5	American Indian / Native American / Alaskan Native
		6	Multiracial
		7	Other

TABLE 1 ► Outcome and Predictor Variables

Variable	Survey Question	Survey Answer Options	
		Option #	Option/Fill-In
Socio-Economic Status	What is your best estimate of your family's total income from last year?	1	\$18,000 or less
		2	\$18,001 - \$24,000
		3	\$24,001 - \$30,000
		4	\$30,001 - \$36,000
		5	\$36,001 - \$45,000
		6	\$45,001 - \$60,000
		7	\$60,001 - \$80,000
		8	\$80,001 - \$100,000
		9	\$100,001 or above
	Do you currently work?	0	No
		1	Yes, 1–5 hours per week
		2	Yes, 6–10 hours per week
		3	Yes, 11–15 hours per week
		4	Yes, 16–20 hours per week
		5	Yes, 21–25 hours per week
		6	Yes, 26–30 hours per week
		7	Yes, 31–35 hours per week
		8	Yes, 36+ hours per week
	What is the highest level of education obtained by your MOTHER* (or guardian)? * A separate survey question with the same options for FATHER	1	Did not finish high school
		2	Graduated from high school
		3	GED
		4	Some college, no degree
		5	2-year college degree (Associate's)
		6	4-year college degree (Bachelor's)
		7	Master's degree
		8	Ph.D. or other advanced professional degree (law, medicine, etc.)
		9	Don't know
Academic Preparation	What is your best estimate of your cumulative unweighted GPA (0.00 to 4.00)?	—	(Fill-in)
	What is your highest composite ACT score?	—	(Fill-in)
	Select the item that best reflects the highest level math course you have taken or are currently taking.	1	Pre-Algebra
		2	Algebra I
		3	Geometry
		4	Algebra II
		5	Advanced Algebra or Trigonometry
		6	Statistics
		7	Pre-Calculus
		8	Calculus

TABLE 1 ► Outcome and Predictor Variables

Variable	Survey Question	Survey Answer Options	
		Option #	Option/Fill-In
Financial Preparation	Did you, or do you plan to, complete the Free Application for Federal Student Aid (FAFSA)?	1	Yes
		2	No
		0	No
	Are you eligible, or do you expect be eligible, to receive a Tennessee Education Lottery Scholarship?	1	Yes, HOPE Award
		2	Yes, HOPE Award with Need Supplement
		3	Yes, General Assembly Merit Scholarship
		4	Yes, Access Award
		5	Yes, Wilder–Naifeh Technical Skills Grant
		6	Yes, but I'm not sure which one
		7	Don't know

(household income, work status in high school, and parents' highest level of education); 3) academic preparation (high school GPA, composite ACT score, highest math taken in high school); and 4) college preparation (completed federal financial aid forms, Tennessee lottery scholarship eligibility status).

Results

Data Preparation and Analysis Plan

First, the response or outcome variable “intention of going to a four- or two-year college or vocational school” was tabulated against each of the predictor variables to explore their possible associations. Chi-square tests of independence were conducted, and, following Astin’s (1991; 2012) recommendation, regression analyses were also conducted to determine the effects of the predictor variables on the outcome variable—“intention of going to a four-year college.” Given that the single outcome variable is categorical and there are multiple predictor variables (both categorical and continuous in nature), the most appropriate statistical model is binary logistic regression (Field 2013). First, the outcome variable was transformed into a dichotomous variable (HigherEd—attend a postsecondary institution—Yes/No) by recoding “Yes” responses to options 2, 3 and 4 (intent to attend

either a four-year institution, a two-year institution or a technical/vocational school) as a “Yes” response and all other options as a “No” response. “Yes” is represented with a 1 and “No” with a 0. Some other survey items were also recoded in a similar way.

As previously discussed, the dependent variable in the current study was college-going intentions of African American and Latino American students. Of the 3,116 students in the study sample who self-identify as African American or Latino, the majority ($n=1,501$, 64.8%) indicated an intention to attend either a four-year college/university ($n=737$, 31.8%), two-year community college ($n=501$, 21.6%), or technical/vocational school ($n=263$, 11.4%) (see Table 2, on page 19). The intention to go to a four-year college is slightly higher in the general sample that includes all ethnicities (that includes African American and Latino American students) than among the African American and Latino students alone. The opposite happens for the intention to go to a two-year college or a vocational school (see Table 3, on page 19).

The possible predictors identified for exploration were classified into four theoretical families: 1) demographics, 2) socioeconomic status, 3) academic preparation, and 4) financial preparation. However, the only quantitative variables are GPA, ACT and SAT because

TABLE 2 ► African-American and Latino Students' Post-Secondary Intentions

	n	%	Valid %	Cumulative Valid %
Work Full Time	406	13.00	17.50	20.10
4-Year College	737	23.70	31.80	51.90
2-Year College	501	16.10	21.60	73.50
Technical/Vocational School	263	8.40	11.40	84.90
Armed Forces	156	5.00	6.70	91.60
Other	195	6.30	8.40	100.00
Missing Information	799	25.60		
Total	3,116	100.00		

TABLE 3 ► Post-Secondary Intentions for All Students in the Sample and for African-American and Latino Students Alone

	African American & Latino (%)	All Races/Ethnicities (%)
4-Year College	23.70	25.20
2-Year College	16.10	13.10
Technical/Vocational School	8.40	6.50
Work Full Time	13.00	17.10
Armed Forces	5.00	4.40
Other	8.20	7.60
Missing Information	25.60	26.30

family income was reported in intervals. These three variables belong to the academic preparation group. Two sample t-tests were conducted to compare the students who planned to pursue higher education and those who did not.

Each categorical predictor variable was assessed for its ability to predict the higher education intentions of students using two-way tables and Chi-Square tests to find out whether the intention to pursue higher education was independent of those variables.

After each possible predictor variable was analyzed one by one regarding its association to the intention of pursuing higher education, the variables were included as predictors in a logistic regression model. In this stage of the analysis, "intention of going to a four-year institution" was the response variable to detect which factors influence the decision for a four-year college—which

is the most ambitious option for the survey item. In addition, models (not included in this paper) were fitted for four-year, two-year colleges, or technical/vocational schools as in the two-way tables, but the effect of the explanatory variables in the model was not so clear. In logistic regression the right-hand side of the equation of a logistic regression model is like that of a linear regression model; however, the response variable is $\log(p/(1-p))$, also called the logit transform of the probability or the logarithm of the odds. The symbol p represents the probability of planning on going to a four-year college. Fitting the model considers all the variables together, and it is a way of detecting which of them are more

useful in explaining the probability of planning to attend a four-year college.

Demographics

Both items selected to assess the relationship between demographics and higher education intentions (students' gender and race) were significantly associated with intention to pursue higher education after high school.

■ **Gender.** There was a significant association between gender and whether students intended to attend a postsecondary institution $\chi^2(2, n=2,305)=10.74, p=0.005$. Specifically, more females (67.5 percent) than males (61.1 percent) in the sample planned to continue education after high school (see Table 4, on page 20).

■ **Race.** There was also a significant association between race and whether students intended to

attend a postsecondary institution $\chi^2(1, n=2,317)=11.16, p=0.001$. Specifically, more African American students (66.2 percent) planned to continue education after high school than Latino Americans (56.9 percent) (see Table 5).

Socioeconomic Status (SES)

The items selected to assess socioeconomic status (SES) included students' household income, work status in high school, and mother's and father's highest level of education. The results were mixed regarding the associations of SES and postsecondary education intentions.

Household Income.

There was a significant association between students' estimate of their previous year's annual household income and whether they intended to attend a postsecondary institution $\chi^2(9, n=2,056)=23.02, p=0.006$. However, since more than 63 percent of students in most segments of the economic scale planned to attend a postsecondary institution—roughly 53 percent of students in the \$18,001–\$24,000 scale responded “Yes”—the pattern is not consistent enough to make a definitive statement regarding the nature of the association between these two variables (see Table 6, on page 21).

TABLE 4 ► Higher Education Attendance Intentions by Gender

Will Attend HigherEd ¹ Institution?		Gender		Total
		Male	Female	
Yes	Count	605	888	1,493
	% within HigherEd ¹	40.50	59.40	100.00
	% within Gender	61.10	67.50	64.80
	% of Total	26.20	38.50	64.80
No	Count	385	427	812
	% within HigherEd ¹	47.40	52.60	100.00
	% within Gender	38.90	32.50	35.20
	% of Total	16.70	18.50	35.20
Total	Count	990	1,315	2,305
	% within HigherEd ¹	42.90	57.00	100.00
	% of Total	42.90	57.00	100.00

¹ Comprises 2- and 4-year colleges as well as technical/vocational schools.

TABLE 5 ► Higher Education Attendance Intentions by Race/Ethnicity

Will Attend HigherEd ¹ Institution?		Race/Ethnicity		Total
		African American	Hispanic/Latino-Latina	
Yes	Count	1,303	198	1,501
	% within HigherEd ¹	86.80	13.20	100.00
	% within Race/Ethnicity	66.20	56.90	64.80
	% of Total	56.20	8.50	64.80
No	Count	666	150	816
	% within HigherEd ¹	81.60	18.40	100.00
	% within Race/Ethnicity	33.80	43.10	35.20
	% of Total	28.70	6.50	35.20
Total	Count	1,969	348	2,317
	% within HigherEd ¹	85.00	15.00	100.00
	% of Total	85.00	15.00	100.00

¹ Comprises 2- and 4-year colleges as well as technical/vocational schools.

HS Work Status. The related survey item was first transformed and recoded into a new dichotomous variable (WorkStatus) where “0” or NO represented students who currently do not work and “1” or YES represented students who indicated any amount of paid employment. There was a significant association between students' employment status during

TABLE 6 ► Higher Education Attendance Intentions by Estimate of Last Year's Family Income

Will Attend HigherEd ¹ Institution?		Estimate of Last Year Family Income (\$)										Total
		0	≤ 18,000	18,001 to 24,000	24,001 to 30,000	30,001 to 36,000	36,001 to 45,000	45,001 to 60,000	60,001 to 80,000	80,001 to 100,000	≥ 100,001	
Yes	Count	4	157	128	91	58	76	66	67	45	43	735
	% within HigherEd ¹	0.54	21.36	17.41	12.38	7.89	10.34	8.98	9.12	6.12	5.85	100.00
	% within FIE ²	50.00	36.51	47.23	36.11	30.53	32.90	31.58	35.45	33.09	30.71	35.75
	% of Total	0.19	7.64	6.23	4.43	2.82	3.70	3.21	3.26	2.19	2.09	35.75
No	Count	4	273	143	161	132	155	143	122	91	97	1,321
	% within HigherEd ¹	0.30	20.67	10.83	12.19	9.99	11.73	10.83	9.24	6.89	7.34	100.00
	% within FIE ²	50.00	63.49	52.77	63.89	69.47	67.10	68.42	64.55	66.91	69.29	26.60
	% of Total	0.19	13.28	6.96	7.83	6.42	7.54	6.96	5.93	4.43	4.72	64.25
Total	Count	8	430	271	252	190	231	209	189	136	140	2,056
	% within HigherEd ¹	0.39	20.91	13.18	12.26	9.24	11.24	10.17	9.19	6.61	6.81	100.00
	% of Total	0.39	20.91	13.18	12.26	9.24	11.24	10.17	9.19	6.61	6.81	100.00

¹ Comprises 2- and 4-year colleges as well as technical/vocational schools.² Family Income Estimate

high school and whether they intended to attend a postsecondary institution $\chi^2(1, n=1,410)=8.04, p=0.005$. Specifically, more unemployed students (76.8 percent) planned to continue their education after high school than those who had jobs (70.1 percent) (*see* Table 7).

► **Parents' Education.** The survey item assessing mother's highest level of education was first recoded into a new dichotomous variable (MotherCollege) where "0" or NO represented mothers with no college education (no high school diploma, diploma, or GED) and "1" or YES represented mothers with some college education. There was a significant association between mother's highest level of education and whether

students intended to attend a postsecondary institution $\chi^2(1, n=2,065)=12.20, p<0.001$. Specifically, more students whose mothers attended college (69.5 percent) planned to continue their own education after high school than those whose mothers had no college education (62.4 percent) (*see* Table 8, on page 22).

TABLE 7 ► Higher Education Attendance Intentions by Student Work Status

Will Attend HigherEd ¹ Institution?		Work Status		Total
		Works	Does not Work	
Yes	Count	505	530	1,035
	% within HigherEd ¹	48.80	51.20	100.00
	% within Work Status	70.10	76.80	73.40
	% of Total	35.80	37.60	73.40
No	Count	215	160	375
	% within HigherEd ¹	57.30	42.70	100.00
	% within Work Status	29.90	23.20	26.60
	% of Total	15.20	11.30	26.60
Total	Count	720	690	1,410
	% within HigherEd ¹	51.10	48.90	100.00
	% of Total	51.10	48.90	100.00

¹ Comprises 2- and 4-year colleges as well as technical/vocational schools.

TABLE 8 ► Higher Education Attendance Intentions by Mother's College Education

Will Attend HigherEd ¹ Institution?		Has Some College		Total
		Yes	No	
Yes	Count	712	648	1,360
	% within HigherEd ¹	52.40	47.60	100.00
	% within Has Some College	69.50	62.20	65.90
	% of Total	34.50	31.40	65.90
No	Count	312	393	705
	% within HigherEd ¹	44.30	55.70	100.00
	% within Has Some College	30.50	37.80	34.10
	% of Total	15.10	19.00	34.10
Total	Count	1,024	1,041	2,065
	% within HigherEd ¹	49.60	50.40	100.00
	% of Total	49.60	50.40	100.00

¹ Comprises 2- and 4-year colleges as well as technical/vocational schools.

TABLE 9 ► Higher Education Attendance Intentions by Father's College Education

Will Attend HigherEd ¹ Institution?		Has Some College		Total
		Yes	No	
Yes	Count	510	699	1,209
	% within HigherEd ¹	42.20	57.80	100.00
	% within Has Some College	66.00	65.40	65.70
	% of Total	27.70	38.00	65.70
No	Count	263	369	632
	% within HigherEd ¹	41.60	58.40	100.00
	% within Has Some College	34.00	34.60	34.30
	% of Total	14.30	20.00	34.30
Total	Count	773	1,068	1,841
	% within HigherEd ¹	42.00	58.00	100.00
	% of Total	42.00	58.00	100.00

¹ Comprises 2- and 4-year colleges as well as technical/vocational schools.

The survey item assessing father's highest level of education was likewise recoded into a new dichotomous variable (FatherCollege) where "0" represented fathers with no college education (no high school diploma, diploma, or GED) and "1" represented fathers with some college education. There was no significant association between father's highest level

of education and whether students intended to attend a postsecondary institution $\chi^2(1, n=1,841)=0.06, p=0.814, NS$. However, there were more missing data for father's education than mother's education ($n=1,841$ versus $n=2,065$), (see Table 9). Among those students whose father had some college education, 66 percent of the students were planning to pursue higher education, and the percent was very similar (65.4 percent) among the students whose father did not have a college education.

Academic Preparation

The items selected to assess academic preparation included students' high school GPA, composite ACT score, SAT and highest-level math course taken by the student in high school. Table 10 displays the means and standard deviation of these four variables for the two groups, those who have the intention of pursuing a higher education and those who do not. The mean GPA and ACT score is higher for those

who plan to pursue higher education than for those who do not as well as the mean level of highest math course taken in high school. When two-sample t-tests were conducted, the difference was significant (p -values < 0.001) for highest level of mathematics courses and ACT and for GPA (p -value 0.004). However, the difference for SAT was not significant (p -value 0.213, perhaps

due to the high variability of those scores inside each group and the sample sizes being smaller since not all students take the SAT). A similar pattern was observed when comparisons were done between those who plan to go to a two- or four-year college or not, and those who plan to go to a four-year college or not. Based on the highest level of math courses, GPA, and ACT, it can be said that academic preparation is significantly associated with intention to pursue higher education after high school.

Financial Preparation

Both items selected to assess students' financial preparation—whether they completed/planned to complete the Free Application for Federal Student Aid (FAFSA) and were eligible for the Tennessee Education Lottery Scholarship (TELS)—were significantly associated with intention to pursue higher education after high school.

■ **Completion of FAFSA.** There was a significant association between students' plans to complete the FAFSA and whether they intended to attend a postsecondary institution $\chi^2(1, n=2,261)=28.70, p < 0.001$. Specifically, more students who completed/planned to complete the FAFSA (67.6 percent) planned to continue their education after high school than those who had no plans to complete the FAFSA (54.4 percent) (see Table 11).

TABLE 10 ► Higher Education Attendance Intentions and Math Proficiency, High School GPA, ACT, and SAT Status

	Will Attend HigherEd ¹ Institution?	n	Mean	Std. Deviation	Std. Error Mean
Highest Math Class Taken	Yes	1147	4.860	1.825	0.054
	No	483	4.160	1.786	0.081
GPA	Yes	1360	2.683	1.054	0.029
	No	704	2.537	1.087	0.041
Highest Composite ACT Score	Yes	1222	17.570	7.469	0.214
	No	622	15.850	8.814	0.353
Highest Composite SAT Score	Yes	849	157.310	411.340	14.117
	No	388	190.870	452.266	22.960

¹ Comprises 2- and 4-year colleges as well as technical/vocational schools.

TABLE 11 ► Higher Education Attendance Intentions by Plans to Complete FAFSA

Will Attend HigherEd ¹ Institution?		Plan to Complete FAFSA		Total
		Yes	No	
Yes	Count	1,212	255	1,467
	% within HigherEd ¹	82.60	17.40	100.00
	% within Plan to Complete FAFSA	67.60	54.40	64.90
	% of Total	53.60	11.30	64.90
No	Count	580	214	794
	% within HigherEd ¹	73.00	27.00	100.00
	% within Plan to Complete FAFSA	32.40	45.60	35.10
	% of Total	25.70	9.50	35.10
Total	Count	1,792	469	2,261
	% within HigherEd ¹	79.30	20.70	100.00
	% of Total	79.30	20.70	100.00

¹ Comprises 2- and 4-year colleges as well as technical/vocational schools.

■ **TELS Eligibility.** There was also a significant association between students' TELS eligibility and whether they intended to attend a postsecondary institution $\chi^2(1, n=2,271)=16.31, p < 0.001$. Specifically, more students who were eligible for any of the Tennessee Lottery scholarships (68.7 percent) planned to continue their education after high school than those who were not eligible to receive a scholarship (60.6 percent) (see Table 12, on page 24).

Other Analyses

A logistic model was used to investigate which were the most important variables associated with the intention to attend a four-year college (see Table 13), and results suggest that: 1) students' gender is not a significant predictor when the academic variables are included in the model; 2) a student's mother having some college education is a significant predictor; however, 3) the academic preparation variables of GPA and the level of math courses taken in high school, in addition to the financial preparation variable of being eligible for the lottery scholarship (which is somewhat related to academic performance) play a greater role in predicting college intentions.

Discussion

This study was an investigation of the effect of potential inputs mentioned in Astin's (1991; 2012) I-E-O theory on Latino and African American students' intentions to pursue higher education after high school. The inputs reflected those previously identified in SEM research (see Park and Hossler 2014) and included: 1) demographics (gender and race); 2) socioeconomic status (household income, work status in high school, and parents' highest level of education); 3) academic preparation (high school GPA, composite ACT score and highest math taken in high school); and 4) financial preparation (completed federal financial aid forms, Tennessee lottery scholarship eligibility status). Overall, there were several statistically significant associations between in-

puts or predictor variables and the intention to pursue higher education for the African American and Latino American Tennessee high school students sampled in the current study.

For the students sampled in this study, the data indicated that female students are more likely than male students to pursue higher education—a steadily increasing trend seen even today where women currently comprise approximately 60 percent of the college student population (Belkin 2021). This is also consistent with Pike's (2016) findings of this sex discrepancy at both two- and four-year colleges. In addition, the data also indicate that African American students reported their intent to pursue higher education significantly more so than Latino American students. Further inves-

TABLE 12 ► Higher Education Attendance Intentions by Eligibility for the Tennessee Educational Lottery Scholarship (TELS)

Will Attend HigherEd ¹ Institution?		Eligible for TELS		Total
		Yes	No	
Yes	Count	837	637	1474
	% within HigherEd ¹	56.80	43.20	100.00
	% within Eligibility for TELS	68.70	60.60	64.90
	% of Total	36.90	28.00	64.90
No	Count	382	415	797
	% within HigherEd ¹	47.90	52.10	100.00
	% within Eligibility for TELS	31.30	39.40	35.10
	% of Total	16.80	18.30	35.10
Total	Count	1219	1052	2271
	% within HigherEd ¹	53.70	46.30	100.00
	% of Total	53.70	46.30	100.00

¹ Comprises 2- and 4-year colleges as well as technical/vocational schools.

TABLE 13 ► Logistic Regression Model for Intention to Attend a Four-Year Institution

	B	Std. Error	Wald	df	Sig.	Exp(B)
MotherCollege	0.248	0.121	4.222	1	0.040	1.281
Gender	0.095	0.121	0.614	1	0.433	1.099
GPA	0.177	0.065	7.453	1	0.006	1.193
EligibleLottery	0.351	0.123	8.124	1	0.004	1.420
Highest Math	0.124	0.035	12.616	1	0.000	1.132
Constant	-2.010	0.232	75.332	1	0.000	0.134

tigations would be needed to determine the possible meaning behind this finding.

Continuing with student demographics, socioeconomic status (SES—household income, HS work status, and parent education), whereas the results regarding household income were inconclusive, the data indicated that mothers' education is more important than fathers' education in predicting whether African American and Latino American students pursue higher education. This is especially interesting considering the previous finding that more women than men intend to enroll in college—a cycle that may bode well for the college enrollment and the Complete College America-related initiatives. Finally, when African American and Latino students are employed in high school, they are also slightly less likely to pursue higher education. This may be because they view postsecondary education as a path to finding a job and they forego that education because they feel like their immediate financial needs are already being met.

As was the case with demographics, academic preparation and performance seem to play important roles in the decision of pursuing higher education. On average, students with plans to attend a four-year or two-year college or a technical/vocational college have slightly higher average GPA and ACT scores and seem to have taken higher-level high school math courses, than students who have no plans to pursue higher education. Finally, students' eligibility for the Tennessee lottery scholarship was also an important determinant in their intention to attend a four-year college, as were academic performance and preparation (GPA and highest-level math courses completed). Taken altogether, academic preparation may be a case of "which came first, the chicken or the egg?"—meaning, did students with intentions to pursue higher education engage in more college readiness activities or actively work to increase their college eligibility? Or did those who had already passively achieved readiness status decide that it was worth the effort to attempt higher education? Although the answer did not emerge from this investigation, perhaps future research may consider longitudinal studies to ascertain a causative relationship.

Implications, Limitations, and Future Research

Implications

Although this research was exploratory in nature, with no specific directional hypotheses offered, it is nevertheless important to summarize the implications learned from said investigation. Taken altogether, the results imply that Latino and African American students' characteristics act as significant input factors to greatly influence the outcome variable of student intentions to pursue postsecondary education. The most significant factor is, perhaps, that students who perceive themselves as college-bound also tend to engage in college-readiness activities (*e.g.*, higher academic achievement via GPA, college entrance examinations like the ACT, financial aid applications like the FAFSA).

Moreover, the study may be beneficial to policymakers who need to understand the demographics of students wishing to pursue postsecondary education. It may also be useful in assisting SEM professionals who target proverbial low-hanging fruit to achieve their short-term objectives. For example, recruitment/enrollment/retention strategies could be tailored to African American and Latino students who are women and/or whose mothers attended college. In addition, a long-term strategy may be to foster engagement with families from these underserved populations via various community outreach events such as on-campus college readiness camps during earlier high school years. As a recruitment tool, this may help students to envision the specific steps (high GPA, ACT scores, and FAFSA completion) along the path to a goal of degree attainment. Similar camps that take place at the authors' host institution are highly regarded by students, their families, and SEM professionals.

Another very important implication for this research on educational policy and decision-making in Tennessee relates to possible interventions to assist students in pursuing a college education. Higher education practitioners cannot intervene to change the educational background of the family or the economic conditions that make it necessary for some students to

work while in high school. However, they can influence the performance of students by engaging in an equity strategy—offering individualized counseling, tutoring services, and the like—to help students set higher goals and achieve higher academic performance. When students perform better academically in high school, they will in turn increase their likelihood of being eligible for a scholarship—both of which are significant indicators of intention to attend college. Better performance in high school will also increase their preparedness to perform well in college and ultimately lead to their successful completion of their academic programs. These steps and so many more will aid in achieving the state and national agendas of increasing the completion rates of their respective citizenry.

Limitations and Future Research

One limitation of the current study is that the college-going rate only captures students' traditional college-going intentions (immediate enrollment) and not those of delayed enrollment students. In addition, this investigation examined only the input portion of the I-E-O theory. It was important to first identify the motivations of historically excluded students to attend college before addressing ways to increase recruitment, retention, and, ultimately, college completion rates in higher education institutions in Tennessee and elsewhere.

As is common in most survey research, another limitation is missing data—as illustrated in the tables for the variables included in the analysis. Variables with a high number of missing data were not included in the analysis. It is also important to note that however hopeful the findings of the current investigation, the associations found are not necessarily indicative of cause-effect relationships. As a result, given that Astin's (1991; 2012) I-E-O theory is best interpreted when used in longitudinal experiments, further investigation is needed to test the causal links between the significant input variables identified in the current study in groups of Latino American and African American Tennessee high school students.

Conclusions

The Obama administration initiated a plan to increase U.S. college attainment from approximately 40 percent in 2009 to 60 percent in 2020. Educational data indicates that the United States fell short of that goal since only 50 percent of American adults had attained an associate's degree or higher by 2020 (Educationdata.org). In Tennessee, educational attainment grew overall (29 percent to 36 percent) from 2010 to 2019 (Pellegrin 2020). In addition, the racial gap in attainment of bachelor's degrees narrowed from 2015 to 2019. Specifically, for white Americans the rate was 29.7 percent (up from 26.8 percent), for African Americans it was 21.7 percent (up from 18.4 percent), and, for Latino Americans it was 18.5 percent (up from 13.2 percent) (Pellegrin 2020). The implications of these findings for SEM research and practice far supersede the stated limitations given that the current zeitgeist and renewed focus on underserved individuals (*e.g.*, the Black Lives Matter movement).

Tennessee has since gone beyond CCTA to achieve its completion initiatives by the 2025 deadline with various other trailblazing higher education initiatives lauded and adapted by other states. For example, the Complete College Tennessee Act of 2018 (CCTA 2018), affectionately referred to as *Complete to Compete*, bridges higher education and workforce needs. Knowing that at least half the jobs in Tennessee will require postsecondary education, legislators in the state pivoted to focus on achieving a goal of at least 55 percent of the adult population having a postsecondary training by the year 2025. Strategies put forth in *Complete to Compete* include free community/technical college, offering working professionals course credit for previous work experience, and requiring students to complete 30 or more credit hours in an academic year. In conclusion, while the state gained focus on workforce outcomes and funding formulas leading to overall degree attainment, it remains unclear whether the two underserved populations in this study are still the focus/target toward its college completion goals.

References

- Astin, A. W. 2012. *Assessment for Excellence: The Philosophy and Practice of Assessment and Evaluation in Higher Education*. Lanham, MD: Rowman & Littlefield Publishers.
- Astin, A. W. 1991. *Assessment for Excellence*. New York: American Council of Education/Macmillan.
- Aud, S., W. Hussar, F. Johnson, G. Kena, E. Roth, E. Manning, X. Wang, and J. Zhang. 2012. *The Condition of Education 2012* (NCES 2012–045). Washington, D.C.: National Center for Education Statistics. Retrieved from: <nces.ed.gov/pubs2012/2012045_5.pdf>.
- Cabrera, A. S. P. 2014. First generation minority students: Understanding the influential factors that contributed to their preparation and decision to pursue higher education. *PSU McNair Scholars Online Journal*. 8(1): 2.
- Callahan, C. N., N. D. LaDue, L. D. Baber, J. Sexton, K. J. van der Hoeven Kraft, and E. M. Zamani-Gallaher. 2017. Theoretical perspectives on increasing recruitment and retention of underrepresented students in the geosciences. *Journal of Geoscience Education*. 65(4): 563–576.
- CCTA. See *Complete College Tennessee Act*.
- Complete College Tennessee Act*. 2018. S.B. 2259/H.B. 2114. Nashville, TN: Tennessee General Assembly. Retrieved from: <capitol.tn.gov/Bills/106/Bill/SB7006.pdf>.
- Complete College Tennessee Act of 2010*. S.B. 7006/H.B. 7008. Nashville, TN: Tennessee General Assembly. Retrieved from: <capitol.tn.gov/Bills/106/Bill/SB7006.pdf>.
- Côté, J. E., and C. G. Levine. 2000. Attitude versus aptitude. Is intelligence or motivation more important for positive higher-educational outcomes? *Journal of Adolescent Research*. 15(1): 58–80.
- Belkin, D. 2021. The number of men enrolled at two- and four-year colleges has fallen behind women by record levels, in a widening education gap across the U.S. *The Wall Street Journal*. September 6. Retrieved from: <[wsj.com/articles/college-university-fall-higher-education-men-women-enrollment-admissions-back-to-school-11630948233](https://www.wsj.com/articles/college-university-fall-higher-education-men-women-enrollment-admissions-back-to-school-11630948233)>.
- Hansen, M. 2021. *Education Attainment Statistics*. New York: Education Data Initiative. Available at: <educationdata.org/education-attainment-statistics>.
- Field, A. 2013. *Discovering Statistics Using SPSS* (4th ed.). Thousand Oaks, CA: Sage Publications Ltd.
- Humes, K. R., N. A. Jones, and R. R. Ramirez. 2011. *Overview of Race and Hispanic Origin: 2010—2010 Census Briefs*. Washington, D.C.: U.S. Census Bureau. Available at: <census.gov/prod/cen2010/briefs/c2010br-02.pdf>.
- Ishler, J., and M. L. Upcraft. 2005. The keys to first-year student persistence. In *Challenging and Supporting the First-Year Student: A Handbook for Improving the First Year of College*, edited by B. O. Barefoot, J. N. Gardner, and M. L. Upcraft. San Francisco: Jossey-Bass.
- Long, P. N., and M. J. Amey. 1993. *A Study of Underprepared Students at One Community College: Assessing the Impact of Student and Institutional Input, Environmental, and Output Variables on Student Success*. Paper presented at the 18th Annual Meeting of the Association for the Study of Higher Education, November 4–10. Retrieved from: <files.eric.ed.gov/fulltext/ED365177.pdf>.
- Obama Administration Archives. n.d. *Increase College Degree Attainment in America*. Retrieved from: <obamaadministration.archives.performance.gov/content/increase-college-degree-attainment-america-0.html>.
- Oseguera, L. 2005. Four and six-year baccalaureate degree completion by institutional characteristics and racial/ethnic groups. *Journal of College Student Retention: Research, Theory and Practice*. 7(1): 19–59.
- Park, E., and D. Hossler. 2014. Understanding student college choice. In *Handbook of Strategic Enrollment Management*, edited by D. Hossler and B. Bontrager. San Francisco: Jossey Bass.
- Pellegrin, M. 2020. *2019 Census Data on Tennesseans' Educational Levels*. Nashville, TN: The Sycamore Institute. Available at: <sycamoreinstitute.org/2019-education-levels/>.
- Pike, G. R., and K. Robbins. 2016. The relationships among individual characteristics, high school characteristics, and college enrollment: Using enrollment propensity as a baseline for evaluating strategic enrollment management efforts. *Strategic Enrollment Management Quarterly*. 3(4): 282–304.
- Ryan, C. L., and J. Siebens. 2012. *Educational Attainment in the United States: 2009. Population Characteristics*. Washington, D.C.: U.S. Census Bureau. Available at: <census.gov/content/dam/Census/library/publications/2012/demo/p20-566.pdf>.
- Tennessee Higher Education Commission. 2021. *Tennessee Higher Education Fact Book 2020–2021*. Nashville, TN: Author. Available at: <tn.gov/content/dam/tn/thec/bureau/research/other-research/factbook/Fact%20Book%202020-2021_Full%20Draft_Suppressed.pdf>.
- . 2012. *Tennessee Higher Education Fact Book 2011–2012*. Nashville, TN: Author. Available at: <[tn.gov/content/dam/tn/thec/bureau/research/other-research/factbook/LM2012_2011-%202012%20Fact%20Book%20for%20Web%20\(13.1.9\).pdf](https://tn.gov/content/dam/tn/thec/bureau/research/other-research/factbook/LM2012_2011-%202012%20Fact%20Book%20for%20Web%20(13.1.9).pdf)>.
- United States Census Bureau. 2010. *2010 Census: Tennessee Profile*. Washington, D.C.: Author. Available at: <census.gov/geo/maps/dc10_thematic/2010_Profile/2010_Profile_Map_Tennessee.pdf>.

About the Authors

**Lorianne D. Mitchell**

Lorianne D. Mitchell, Ph.D., is an Associate Professor of Management in the Department of Management & Marketing of the College of

Business & Technology at East Tennessee State University. Lorianne earned her Ph.D. in Industrial & Organizational Psychology from the Graduate School & University Center of the City University

of New York. She conducts research in the areas of Online Teaching Pedagogy, Diversity in Higher Education, Mentoring, and Emotions in Organizations.

**Edith Seier**

Edith Seier, Ph.D., is an Associate Professor Emeritus of Mathematics & Statistics

in the College of Arts & Sciences at East Tennessee State University. Edith earned her Ph.D. in Statistics from the University of Wyoming and conducts

research in the areas of Kurtosis & Variability and Applications of Statistics to Biology, Public Health, and Medicine.

**Michael H. Small**

Michael H. Small, D.B.A., is a Full Professor Emeritus of Management in the Department of Man-

agement & Marketing of the College of Business & Technology at East Tennessee State University. Michael earned his D.B.A. from Cleveland State University

and conducts research in the areas of Supply Chain Management, Manufacturing and Business Administration.