PREDICTING LATINO MALE STUDENT RETENTION: THE EFFECT OF PSYCHOSOCIAL VARIABLES ON PERSISTENCE FOR FIRST-YEAR COLLEGE STUDENTS AT A

SOUTHWEST UNIVERSITY

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McGuire, Melissa. *Predicting Latino Male Student Retention: The Effect of Psychosocial Variables on Persistence for First-year College Students at a Southwest University*. Doctor of Philosophy (Higher Education), May 2015, 114 pp., 10 tables, 1 figure, references, 86 titles.

The purpose of this study was to investigate and predict Latino male student retention using ACT’s Engage College survey at a research university in the southwestern region of the U.S. ACT’s Engage survey was designed to predict first-year college retention using 10 psychosocial measures. However, no empirical study exists to support ACT’s claim especially for Latino male students. Data from a four-year research university between 2009 and 2011 were analyzed with logistic regression. Logistic regression analysis was performed for the whole sample ($N = 8,061$) and for the Latino male subsample ($n = 860$). In the entire sample’s first regression model, high school grade quartile and SAT score as well as demographic variables were used as predictor variables. In this model, the independent variables of high school grade point average quartile, SAT score, gender, and race made statistically significant contributions to the model (Nagelkerke $R^2 = .031$, $p < .01$). In the entire sample’s second regression model, ACT’s 10 psychosocial variables were added to the first regression model as predictor variables. Results indicated the instrument was valid for the freshmen as a whole because five out of 10 psychosocial measures displayed statistically significant odds ratios (ORs) for predicting retention: (a) Commitment to College ($OR = 1.006, p < .01$), (b) Academic Discipline ($OR = 1.005, p < .01$), (c) Social Activity ($OR = -.997, p < .01$), (d) Social Connection ($OR = 1.004, p < .01$), and (e) Academic Self-Confidence ($OR = -.997, p < .01$).

Regarding the subsample of 860 Latino males, none of the 10 psychosocial measures produced statistically significant results. The findings indicate the need to determine a new way of identifying at-risk Latino male students because current methods have failed to build a robust predictive model for this student population.
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Introduction

College enrollment has grown exponentially since 1945 when higher education moved into an era of massive expansion and academic standardization (Greiger, 2005). However, retention and graduation of college students, particularly across ethnic minorities and males, has not kept pace with enrollment growth. Each year, faculty and staff at institutions across the country are faced with the challenge of retaining first-year students, and often they find students entering college are either underprepared for the academic rigor expected at the college level or simply unable to balance coursework, relationships, and employment. These students have often been labeled as at-risk and can significantly impact an institution’s first-year to second-year retention rate. One specific subset of at-risk students gaining attention from institutional administrators and policy makers across the country are racial/ethnic minority males. The discrepancy in the male minority students’ college success, compared to Caucasians and minority females, impacts these students’ ability to reach the ultimate college milestone of college completion. Initiatives, such as President Obama’s My Brother’s Keeper, have been launched to narrow the opportunity gaps for men of color (Office of the Press Secretary of the White House, 2014) and have helped to keep these populations in the limelight.

Some policy makers have argued that the success of minority males has become an educational crisis requiring immediate attention (College Board, 2010). Segmenting this group further, and one subgroup of growing national concern given their growth pattern is Latino males. Because the number of Latino males who make it to college at all is dismal, retaining and
graduating them becomes even more critical from a policy point of view. Increasingly
administrators focus efforts on male students because of the persistence and completion
disparity observed between the genders. According to the College Board (2010), the degree
completion rates for females are 4% to 10% higher than the completion rates for males. This
achievement gap is compounded by the completion differences between ethnic groups.

The Latino population is the fastest growing ethnic group with approximately one in
every six Americans being part of this demographic (Ennis, Rios-Vargas, & Albert, 2011). This
growth rate represents a 45% growth in the ethnic population within a 10-year period (Pew
Hispanic Center, 2011). The Latino population is likely to become the majority group within the
national population and drive labor force growth (Sáenz & Ponjuan, 2011).

Despite the significant growth in the Latino population, educational attainment of this
group has lagged. Even though more Latino students enter college, their completion rates have
only modestly increased. From 2009 to 2010, Latino college enrollment grew 24%, a single year
gain no other ethnic group experienced (Fry, 2011). As Latino enrollments increased, only 13%
of Latinos 25 to 29 years old completed a college degree (National Center for Education
Statistics [NCES], 2010). In 2009, of the degrees awarded to Latinos, 62.2% were awarded to
Latina women (NCES, 2010). Although the gender gap is evident by these statistics, the gender
gap that exists in higher education, particularly with the Latino population, has “largely gone
unnoticed and under-examined by policy makers and educational leaders” (Sáenz & Ponjuan,
2011, p. 4). These statistics indicate that, if the educational gap for Latino students is not
reduced as the U.S. Latino population percentage increases, the national educational
attainment rates are likely to decrease.
Before effective change in retention strategies can occur, greater understanding of this problem is needed. Currently, little empirical evidence exists about the factors that may contribute to Latino males’ college persistence. Therefore, I investigated the impact of cognitive and psychosocial factors on the persistence of first-year Latino male college students.

Literature Review

The majority of college student success literature including underrepresented populations has been focused on minorities as a collective whole rather than focusing on differences between race and ethnicity categories (Allen, 1999; Elmers & Pike, 1997; Kahn & Nauta, 2001). Studies focused on racial/ethnic minorities tend to have small Latino samples; and studies about Latinos often have not included gender in the investigations (Arbona & Nora, 2007; Arrendono, Kurpius, & Rund, 2011; Baker & Robnett, 2012; Bordes-Edgar, Gloria, Castellanos, Lopez, & Rosales, 2005; Hoffman & Lowitzki, 2005;). With particular regard to the Latino college student population, the research has been centered most often on access rather than persistence and completion. Challenges to access have been linked to lower family income levels and parental education (Arbona & Nora, 2007; Harrell & Forney, 2003; Longerbeam, Sedlacek, & Alatorre, 2004), poor academic preparation (Ramani, Giblertson, Fox, & Provasnik, 2007), and information regarding the pathways to high education (McDonough, 1997). However, little empirical research has provided insight on why Latinos have more difficulty navigating the college experience and reaching the point of successful completion (Sáenz & Ponjuan, 2009).

Of the available research, social support has shown a positive effect on persistence of Latino college students (Gloria, Castellanos, Lopez, & Rosales, 2005). Most notably, social
support has been studied through the lens of parental educational attainment or a parent’s expectation that the student attend college (Arbona & Nora, 2007; Wells, 2008). Parental expectations for their children to attend college strongly predict success in college over typical precollege factors like SAT score or high school grade point average (GPA). Parental expectations also add to the social or cultural capital that a minority student brings to college (Strayhorn, 2010; Wells, 2008).

Social capital includes factors such as a parent’s degree attainment, socioeconomic status, and use of test preparation materials prior to taking the Scholastic Aptitude Test (SAT) or American College Test (ACT). Strayhorn (2010) showed social and cultural capital to be statistically significant predictors of Latino student success in college, and most Latino students enter college with less social and cultural capital than their Caucasian peers (Wells, 2008). The findings from studies on parental involvement and social and cultural capital offer important clues about ethnic differences in retention between students of different ethnic backgrounds. While all students likely need to feel a sense of support from various people in their lives and need to believe they can navigate the college experience, Wells (2008) and Strayhorn (2010) suggested that the influence of parental support is more important to the retention of Latino students than Caucasian students.

In the past two decades, researchers have investigated non-cognitive factors, such as self-efficacy, locus of control, social and cultural capital; and the impact of these variables on college student success has been studied (Allen, Robbins, Casillas, & Oh, 2008; Friedman & Mandel, 2011; Gore, 2006; Robbins, Allen, Casillas, Peterson, & Le, 2006; Robbins et al., 2004). Non-cognitive factors have been shown to help predict student persistence and success in
college, but in many of the studies involving non-cognitive variables, the Latino population was
the least represented group in the sample or was not considered. None of the studies
investigated Latino males as a separate group.

A few studies have considered the use of non-cognitive factors in predicting retention of
racial/ethnic minority students, and the results are mixed. In research about differences in
retention between racial/ethnic minorities and Caucasians, Allen (1999) found that motivational
factors can explain a larger percentage of the variance in predicting retention and observed no
difference in retention between racial/ethnic minorities and Caucasians. Contradictory to Allen’s
finding, Kahn and Nauta (2001) explored the social-cognitive factors that might predict
retention and afforded specific attention to Latinos. Kahn and Nauta found that precollege
measures did not explain a significant portion of the variance in retention. Instead, retention
was better predicted by data from social-cognitive variables collected in the second semester of
the freshman year.

Many recent studies on the impact of psychosocial factors on student persistence have
utilized the Engage College survey developed by ACT (2012), but many of these studies were
conducted by researchers who were employed at ACT. Friedman and Mandel (2011), not
associated with ACT, , utilized the Needs Assessment Questionnaire (NAQ) to determine if
psychosocial factors similar to those in the ACT Engage College survey could explain college
success above and beyond typical precollege factors like SAT and high school GPA. Although
their sample size was limited and the sample lacked focus on Latino students, Friedman and
Mandel concluded that a student’s need for achievement, affiliation, autonomy, and dominance
did not predict retention. However, the use of psychosocial factors in retention-oriented
predictive modeling has not been widely studied, and the need for additional understanding of
the predictive ability of psychosocial factors across groups of students is notably needed.

Theoretical Framework

In recent years, researchers have expanded on the classic student retention models by
Astin (1975), Bean (1980), Lewin (1951), Spady (1970), and Tinto (1975, 1987) to include cultural
influences and institutional characteristics (Kuh & Love, 2004; Nora & Cabrera, 1996). Through a
research commissioned by the National Postsecondary Education Cooperative (NPEC), Perna
and Thomas (2006) sought to develop a conceptual model for understanding student success in
a format that could reduce the gaps in success across income, class, and racial and ethnic
groups. Unlike other retention models, Perna and Thomas presented their model with the
intention of developing approaches to improve student success rather than develop a singular
theory for describing the college student experience. Perna and Thomas’ model provided the
theoretical framework followed in this study. Figure 1 presents Perna and Thomas’s conceptual
model for student success.

Central to the conceptual framework is Perna and Thomas’ (2006) definition of student
success as “the completion or maximization” (p. 4) of four key transitions in the college student
experience. The transitions involved the following: (a) college readiness, (b) college enrollment,
(c) college achievement, and (d) post college attainment. Within these four key transitions are
the following ten success indicators: (a) educational aspirations, (b) academic preparation, (c)
college access, (d) college choice, (e) academic performance, (f) transfer, (g) persistence, (h)
post baccalaureate enrollment, (i) future income, and (j) educational attainment. Finally, four
defining characteristics of Perna and Thomas’ model underscored the framework as applied in
my study: (a) student success is a longitudinal process, (b) student success is shaped by multiple layers of context, (c) the contribution to success by the student varies by student, and (d) success varies across groups. Additionally, the indicators central to my investigation included the factors falling under college readiness. The applicable college readiness factors were academic preparation, college achievement, and persistence.

Figure 1. Perna and Thomas's conceptual model for student success as the theoretical framework for the current study.

Purpose of the Study and Research Questions

In 2011, after a review of census data and educational statistics for the Latino population, Sáenz and Ponjuan (2011) developed *Blueprint for Action* hoping to improve the
educational outcomes for Latino males. First on their blueprint is the need to create awareness on this issue. Although college completion is the ultimate goal for a college freshman, the first indicator of college success is persistence from the first-year to second-year of college as 57% of all dropouts from universities occur between the first and second year (Tinto, 1996). The purpose of this study was to investigate and predict Latino male student retention. This task was accomplished by using the ACT Engage College survey results and student retention data from a four-year research university located in the Southwest region of the US. I sought to increase awareness of college success for the Latino male student in order to help policy makers, higher education administrators, and faculty create effective policies and practices to increase the success of Latino males in college. The following research questions guided this study:

1. Are there statistically significant relationships between a first-year student’s likelihood to persist at a four-year postsecondary institution and the student’s SAT score, high school academic achievement as measured by quartile ranking, gender, and race/ethnicity?

2. Are there statistically significant relationships between a first-year student’s likelihood to persist at a four-year postsecondary institution and the student’s motivational and skills scores, social engagement scores, and self-regulation scores, which were all measured by the ACT Engage College survey, after controlled for the student’s SAT score, high school academic achievement as measured by quartile ranking, gender, and race/ethnicity?

3. Are there statistically significant relationships between a first-year Latino male student’s likelihood to persist at a four-year postsecondary institution and the
student’s motivational and skills scores, social engagement scores, and self-regulation scores, which were all measured by the ACT Engage survey, after controlled for the student’s SAT score and high school academic achievement as measured by quartile ranking?

My hypothesis was that similar to research conducted through various studies, SAT score, high school academic achievement, as measured by high school quartile rank, gender, and race/ethnicity explain a statistically significant amount of the variance in student persistence. Once the ACT Engage College survey scores were added to the baseline model, I believed the Engage College scale scores would explain some variance of a student’s persistence. However, once Latino male students were singled out, I expected the results to be different from the overall population because of cultural differences of the Latino population.

Method

The data were derived from the 2009, 2010, and 2011 administrations at the selected institution of the ACT Engage College survey (formally known as the Student Readiness Inventory). The Engage College survey, developed by ACT, contained a 108-item instrument measuring across three domains explained in detail below:

Domain 1. Motivation and skills: Personal characteristics of a student that help them succeed academically by focusing effort toward goal-driven activities. Scales under this domain include Academic Discipline, Academic Self-Confidence, Commitment to College, Communication Skills, General Determination, and Goal Striving (ACT, 2012).

Domain 2. Social engagement: Interpersonal factors that influence a student’s integration
into the collegiate environment. Scales under this domain include Social Activity and Social Connection (ACT, 2012).

Domain 3. Self-regulation: Cognitive and affective capacity used to monitor, regulate, and control behavior related to learning, or the belief that the student can perform well in college, which has also been linked to ideas of self-efficacy. Scales include Steadiness and Study Skills (ACT, 2012).

Collectively, the instrument’s domains combine with the cognitive predictors of college success with the instruments’ 10 psychosocial predictors to provide institutional representatives information that may help them better identify at-risk students. The 10 psychosocial scales falling within the three domains served as independent variables. The 10 psychosocial scales were Academic Discipline, Academic Self-Confidence, Commitment to College, Communication Skills, General Determination, Goal Striving, Social Activity, Social Connection, Steadiness, and Study Skills. The instrument data also included information about participants’ cognitive factors including high school GPA and ACT score. However, I utilized official university data to ensure accuracy and reliability, given the inherent limitations of self-report data. First-year retention data served as the dependent variable.

The target population was all new first-time in college freshmen at a four-year public university located in a southwestern state of the US and situated in a rural/urban environment who entered college during the fall semesters of 2009, 2010, and 2011. Students who attended the university’s mandatory freshman orientation program formed the sample. The institution was classified by the Carnegie Foundation for the Advancement of Teaching as a Doctoral Research–High Research institution. The institution enrolled approximately 35,000 students,
and approximately 15% were Latino students. About 55% of the students were females, and 45% were males (University of North Texas, 2011).

Once all incomplete and unusable data were removed, 9,584 records remained for analysis. Women represented 56% of the data \((n = 5,398)\) and men composed 44\% \((n = 4,186)\). In terms of race and ethnicity, 56\% of the population was White \((n = 5,417)\), with the second largest population being Latino \((n = 1,896, \text{ or } 20\% \text{ of the entire dataset})\). The average SAT score was 1091, and 85\% if the dataset were in the top and second quarters of their high school class. Latino men, the primary focus of the study, comprised 9\% of the dataset at 860. The first-year retention rate for all students in the sample was 77.5\%. The first year retention rate of Latino men was 75\% \((n = 644)\), a percent slightly lower than the overall first-year retention rate.

For data analysis, binary logistic regression was utilized to determine if there were statistically significant relationships between a first-year Latino male student’s likelihood to persist at a four-year postsecondary institution and their scale scores within the motivational and skills, social engagement, and self-regulation domains, as measured by the ACT Engage College survey. The student’s SAT scores and high school academic achievement records operated as controls for the regression. This statistical model was appropriate given the dichotomous nature of the dependent variable (Aiken & West, 1991) and was able to demonstrate the strength of the association between the predictive factors and actual success data and to indicate how much of the variance was accounted for by the predictors and how much by mere chance (Cramer & Howitt, 2004). All 10 psychosocial variables were standardized for interpretation purposes.

Categorical coding was applied to the ethnicity variable, and the category of White
served as the baseline or reference group. Dummy coding was applied to the gender variable, with female serving as the baseline or reference group. Because academic achievement was considered through four quartiles, five categories were developed with the fifth encompassing students who had no high school rank. Applying the $k - 1$ statistical practice, the second quarter, third quarter, fourth quarter, and no rank categories of students were coded, and the category containing the top or first quarter of students was the baseline or reference group.

Results

The dataset was first analyzed with descriptive statistics. The final sample size for all first time in college students used in the sample was 8,091. The sample was 60% White and 55% female. Students from the top quarter of their high school class were 54%. Table 1 lists the standard descriptive statistics for each of the psychosocial variables within the entire dataset.

Research Question 1

Table 2 shows which variables influencing first-year retention when typical predictive measures were considered alone for the entire dataset. Only variables that attained the $p < .01$ significance level were considered given the sample size. Although there was some concern about using both SAT score and high school GPA for fear of multicollinearity issues, test of tolerance and variation inflation (VIF) indicated no reason for concern. The SAT variable had a tolerance score of .959 and a VIF of 1.042. High school GPA quartiles fell in a similar range (2nd quarter tolerance = .876, VIF = 1.142; 3rd quarter tolerance = .930, VIF = 1.076; 4th quarter tolerance = .991, VIF = 1.009; No rank tolerance = .968, VIF = 1.033). All tolerance scores were greater than .01, and VIF scores were less than 10, allowing GPA and SAT variables to fall in an acceptable range (Cohen, Cohen, West, & Aiken, 2003). Although some correlations were
present, their values were low and did not warrant concern. The correlation coefficients were judged to be stable and the standard errors were deemed too small to be inflated.

Table 1

Descriptive Statistics

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Minimum</th>
<th>Maximum</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commitment to College</td>
<td>1</td>
<td>99</td>
<td>60.36</td>
<td>28.96</td>
</tr>
<tr>
<td>Goal Striving</td>
<td>1</td>
<td>99</td>
<td>57.74</td>
<td>28.23</td>
</tr>
<tr>
<td>Academic Discipline</td>
<td>1</td>
<td>99</td>
<td>56.99</td>
<td>29.71</td>
</tr>
<tr>
<td>General Determination</td>
<td>1</td>
<td>99</td>
<td>59.63</td>
<td>28.09</td>
</tr>
<tr>
<td>Study Skills</td>
<td>1</td>
<td>99</td>
<td>57.37</td>
<td>28.50</td>
</tr>
<tr>
<td>Communication Skills</td>
<td>1</td>
<td>99</td>
<td>59.01</td>
<td>28.08</td>
</tr>
<tr>
<td>Social Activity</td>
<td>1</td>
<td>99</td>
<td>52.39</td>
<td>30.10</td>
</tr>
<tr>
<td>Social Connection</td>
<td>1</td>
<td>99</td>
<td>57.10</td>
<td>27.68</td>
</tr>
<tr>
<td>Academic Self-Confidence</td>
<td>1</td>
<td>99</td>
<td>58.23</td>
<td>27.34</td>
</tr>
<tr>
<td>Steadiness</td>
<td>1</td>
<td>99</td>
<td>59.98</td>
<td>28.14</td>
</tr>
<tr>
<td>SAT Score</td>
<td>500</td>
<td>1600</td>
<td>1091.44</td>
<td>138.75</td>
</tr>
</tbody>
</table>

Results for Research Question 1 logistic regression model indicated that first year retention at a four-year public institution was significantly influenced by only a few background and cognitive factors based on comparisons to the reference variables. The goodness of fit for the model appeared to be acceptable given the overall Cox and Snell index was .02, and because this pseudo $R^2$ has a maximum value of only .75, the Nagelkerke $R^2$ was considered to adjust the maximum value to 1 (Cohen et al., 2003). The Nagelkerke $R^2$ value was .031, indicating 3% of the variance was accounted for by the independent variables.
### Table 2

*Logistic Regression Model of the Background Predictors of the First Year Retention*

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Coefficients (log-odds)</th>
<th>SE</th>
<th>OR</th>
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<tr>
<td><strong>Quartile Rank Group</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st (Top) Quarter (reference group)</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Quarter</td>
<td>-.410</td>
<td>.056</td>
<td>.664*</td>
</tr>
<tr>
<td>3rd Quarter</td>
<td>-.615</td>
<td>.088</td>
<td>.540*</td>
</tr>
<tr>
<td>4th (Bottom) Quarter</td>
<td>.752</td>
<td>.237</td>
<td>.471*</td>
</tr>
<tr>
<td>No Rank</td>
<td>-.105</td>
<td>.167</td>
<td>.901</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White (reference group)</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>.171</td>
<td>.077</td>
<td>1.187</td>
</tr>
<tr>
<td>Latino</td>
<td>.084</td>
<td>.067</td>
<td>1.087</td>
</tr>
<tr>
<td>American Indian</td>
<td>.045</td>
<td>.216</td>
<td>1.046</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>.440</td>
<td>.122</td>
<td>1.552*</td>
</tr>
<tr>
<td>Nonresident/International</td>
<td>.347</td>
<td>.447</td>
<td>1.415</td>
</tr>
<tr>
<td>Other Ethnicity</td>
<td>-.230</td>
<td>.319</td>
<td>.795</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (reference group)</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>.193</td>
<td>.052</td>
<td>1.212*</td>
</tr>
<tr>
<td>SAT Score</td>
<td>.001</td>
<td>.000</td>
<td>1.001*</td>
</tr>
</tbody>
</table>

*Note.* NA means not applicable for reference group; * indicates significance at *p* < .01.

First year retention was positively predicted by SAT score (*OR* = 1.001, *p* < .01) and gender (i.e., males compared to their female counterparts). Females were 21% more likely to be retained. Compared to Whites, Asian/Pacific Islander students were 55% more likely to be retained (*p* < .01). Asian/Pacific Islander was the only ethnicity to demonstrate a statistically significant effect. In contrast to those variables displaying positive predictions of first-year
retention, high school rank had a statistically significant negative effect, when compared against the top quarter ranking. Students in the second \((OR = .644, p < .01)\), third \((OR = .540, p < .01)\), and fourth \((OR = .471, p < .01)\) high school quartiles.

Research Question 2

The first model analyzed only considered the predictor variables of ethnicity, gender, high school rank, and SAT score. The second research question’s logistic regression model included the ACT Engage College’s 10 psychosocial scales. With the addition of the psychosocial scales, the -2 Log Likelihood dropped 104 points, suggesting that the addition of psychosocial factors was value added. Table 3 outlines the addition of psychosocial variables to the model.

Out of the 10 Engage College psychosocial scales, half predicted retention with statistically significance in the retention model. The five statistically significant psychosocial predictors were Commitment to College \((OR = 1.006, p < .01)\), Academic Discipline \((OR = 1.005, p < .01)\), Social Activity \((OR = .997, p < .01)\), Social Connection \((OR = 1.004, p < .01)\), and Academic Self-Confidence \((OR = .997, p < .01)\). Social Activity and Academic Self-Confidence had negative relationships with first-year retention.
### Table 3

**Logistic Regression Model Including Both Background Variables and Psychosocial Measures**

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Coefficients (log-odds)</th>
<th>SE</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quartile Rank Group</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st (Top) Quarter (reference group)</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Quarter</td>
<td>-.344</td>
<td>.057</td>
<td>.709*</td>
</tr>
<tr>
<td>3rd Quarter</td>
<td>-.498</td>
<td>.091</td>
<td>.607*</td>
</tr>
<tr>
<td>4th (Bottom) Quarter</td>
<td>-.577</td>
<td>.241</td>
<td>.561</td>
</tr>
<tr>
<td>No Rank</td>
<td>-.057</td>
<td>.169</td>
<td>.944</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White (reference group)</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>.196</td>
<td>.079</td>
<td>1.217</td>
</tr>
<tr>
<td>Latino</td>
<td>.096</td>
<td>.068</td>
<td>1.101</td>
</tr>
<tr>
<td>American Indian</td>
<td>.060</td>
<td>.218</td>
<td>1.062</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>.422</td>
<td>.122</td>
<td>1.526*</td>
</tr>
<tr>
<td>Nonresident/International</td>
<td>.325</td>
<td>.450</td>
<td>1.384</td>
</tr>
<tr>
<td>Other Ethnicity</td>
<td>-.175</td>
<td>.321</td>
<td>.840</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (reference group)</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>.083</td>
<td>.055</td>
<td>1.086</td>
</tr>
<tr>
<td>SAT Score</td>
<td>.002</td>
<td>.000</td>
<td>1.002*</td>
</tr>
<tr>
<td><strong>Engage College Psychosocial Measures</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commitment to College</td>
<td>.178</td>
<td>.000</td>
<td>1.195*</td>
</tr>
<tr>
<td>Goal Striving</td>
<td>.003</td>
<td>.923</td>
<td>1.003</td>
</tr>
<tr>
<td>Academic Discipline</td>
<td>.155</td>
<td>.000</td>
<td>1.168*</td>
</tr>
<tr>
<td>General Determination</td>
<td>-.027</td>
<td>.480</td>
<td>.974</td>
</tr>
<tr>
<td>Study Skills</td>
<td>-.027</td>
<td>.443</td>
<td>.973</td>
</tr>
<tr>
<td>Communication Skills</td>
<td>-.030</td>
<td>.417</td>
<td>.971</td>
</tr>
<tr>
<td>Social Activity</td>
<td>-.088</td>
<td>.009</td>
<td>.916*</td>
</tr>
<tr>
<td>Social Connection</td>
<td>.120</td>
<td>.001</td>
<td>1.128*</td>
</tr>
<tr>
<td>Academic Self-Confidence</td>
<td>-.095</td>
<td>.002</td>
<td>.910</td>
</tr>
<tr>
<td>Steadiness</td>
<td>.001</td>
<td>.996</td>
<td>1.001</td>
</tr>
</tbody>
</table>

*Note.* NA means not applicable for reference group. * indicates significance at p < .01.
Research Question 3

Once the predictive ability of the Engage College survey instrument was established for the entire dataset, the logistic regression models were rerun with only Latino males \((n = 860)\) as the sample. The intent of this action was two-fold. First, I determined if adding psychosocial measures to a predictive model were value-added. Second, I sought to understand if prediction differences existed for Latino males when compared to the data as a whole. When the Latino males were singled out as a specific, small sample from the dataset, the only variables attaining \(p < .01\) were judged to be significant contributors to the model. Table 4 displays the Latino males’ descriptive statistics for the 10 psychosocial variables. Table 5 outlines the ORs when considering the logistic regression model depicting background-related variables predictive abilities regarding retention.

Similar to the first logistic regression model used for Research Question 1, when Latino males were considered alone in this model, only the males in the second \((OR = .589, p < .01)\) high school grade quartiles produced significant prediction results. The goodness of fit for this model was slightly higher than it was for previous models addressing the whole dataset. The model for the Latino males showed the Cox and Snell index as .021 and the Nagelkerke \(R^2\) as .032, which was similar to the goodness of fit for the entire dataset.

Table 6 summarizes the results of the second logistic regression model for the Latino male sample in which the 10 psychosocial variables were added to the model. Although the -2 Log Likelihood decreased once the 10 Engage College psychosocial scales were added to the model, the decrease was a modest 14 points. Considering Latino males alone, none of the Engage College psychosocial scales produced statistically significant results in relation to first-
year retention. Additionally, similar to when all variables were considered for the entire dataset in answering Research Question 2, the goodness to fit of the model increased slightly. The Cox and Snell index was .031 and the Nagelkerke $R^2$ was .048. While only 5% of the variance was explained in this model, the value represented the largest amount of variance explained across all models.

Table 4

*Psychosocial Scales’ Descriptive Statistics for Only Latino Males*

<table>
<thead>
<tr>
<th>Psychosocial Scale</th>
<th>Minimum</th>
<th>Maximum</th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commitment to College</td>
<td>1</td>
<td>99</td>
<td>60.36</td>
<td>28.96</td>
</tr>
<tr>
<td>Goal Striving</td>
<td>1</td>
<td>99</td>
<td>57.74</td>
<td>28.23</td>
</tr>
<tr>
<td>Academic Discipline</td>
<td>1</td>
<td>99</td>
<td>56.99</td>
<td>29.71</td>
</tr>
<tr>
<td>General Determination</td>
<td>1</td>
<td>99</td>
<td>59.63</td>
<td>28.09</td>
</tr>
<tr>
<td>Study Skills</td>
<td>1</td>
<td>99</td>
<td>57.37</td>
<td>28.50</td>
</tr>
<tr>
<td>Communication Skills</td>
<td>1</td>
<td>99</td>
<td>59.01</td>
<td>28.08</td>
</tr>
<tr>
<td>Social Activity</td>
<td>1</td>
<td>99</td>
<td>52.39</td>
<td>30.10</td>
</tr>
<tr>
<td>Social Connection</td>
<td>1</td>
<td>99</td>
<td>57.10</td>
<td>27.68</td>
</tr>
<tr>
<td>Academic Self-Confidence</td>
<td>1</td>
<td>99</td>
<td>58.23</td>
<td>27.39</td>
</tr>
<tr>
<td>Steadiness</td>
<td>1</td>
<td>99</td>
<td>59.98</td>
<td>28.14</td>
</tr>
<tr>
<td>SAT Score</td>
<td>500</td>
<td>1600</td>
<td>1091.44</td>
<td>138.75</td>
</tr>
</tbody>
</table>

*Note.* Latino male $n = 860.$

Table 5

*Logistic Regression Model of the Background Predictors of First-year Retention for Latino Males*

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Coefficients (log-odds)</th>
<th>$SE$</th>
<th>$OR$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartile Rank Group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st (Top) Quarter (reference group)</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Quarter</td>
<td>-.529</td>
<td>.164</td>
<td>.589*</td>
</tr>
<tr>
<td>3rd Quarter</td>
<td>-.524</td>
<td>.384</td>
<td>.592</td>
</tr>
<tr>
<td>4th (Bottom) Quarter</td>
<td>-.372</td>
<td>1.132</td>
<td>.689</td>
</tr>
<tr>
<td>No Rank</td>
<td>.833</td>
<td>1.052</td>
<td>2.30</td>
</tr>
<tr>
<td>SAT Score</td>
<td>.002</td>
<td>.001</td>
<td>1.002</td>
</tr>
</tbody>
</table>

*Note.* NA means not applicable for reference group. * indicates significance at $p < .01.$
Table 6

**Logistic Regression Model Including Both Background Variables and Psychosocial Measures for Latino Males**

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Coefficients (log-odds)</th>
<th>SE</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quartile Rank Group</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st (Top) Quarter (reference group)</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Quarter</td>
<td>-.498</td>
<td>.170</td>
<td>.608*</td>
</tr>
<tr>
<td>3rd Quarter</td>
<td>-.441</td>
<td>.393</td>
<td>.643</td>
</tr>
<tr>
<td>4th (Bottom) Quarter</td>
<td>-.109</td>
<td>1.147</td>
<td>.897</td>
</tr>
<tr>
<td>No Rank</td>
<td>.1.019</td>
<td>1.057</td>
<td>2.770</td>
</tr>
<tr>
<td><strong>SAT Score</strong></td>
<td>.002</td>
<td>.001</td>
<td>1.002</td>
</tr>
<tr>
<td><strong>Psychosocial Measures</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commitment to College</td>
<td>.212</td>
<td>.106</td>
<td>1.236</td>
</tr>
<tr>
<td>Goal Striving</td>
<td>-.051</td>
<td>.116</td>
<td>.950</td>
</tr>
<tr>
<td>Academic Discipline</td>
<td>.077</td>
<td>.106</td>
<td>1.080</td>
</tr>
<tr>
<td>General Determination</td>
<td>.008</td>
<td>.117</td>
<td>1.008</td>
</tr>
<tr>
<td>Study Skills</td>
<td>-.114</td>
<td>.113</td>
<td>.892</td>
</tr>
<tr>
<td>Communication Skills</td>
<td>-.077</td>
<td>.111</td>
<td>.926</td>
</tr>
<tr>
<td>Social Activity</td>
<td>-1.01</td>
<td>.101</td>
<td>.904</td>
</tr>
<tr>
<td>Social Connection</td>
<td>-.160</td>
<td>.108</td>
<td>1.174</td>
</tr>
<tr>
<td>Academic Self-Confidence</td>
<td>-.034</td>
<td>.094</td>
<td>.967</td>
</tr>
<tr>
<td>Steadiness</td>
<td>.119</td>
<td>.092</td>
<td>1.126</td>
</tr>
</tbody>
</table>

*Note.* NA means not applicable for reference group. * indicates significance at $p < .01$.

**Discussion**

The purpose of this study was to investigate if the ACT Engage College assessment was a psychometrically valid predictive tool for the first-year retention of Latino male college students at a single institution. The first two original hypotheses included the following: (a) background predictive measures (gender, ethnicity, high school GPA quartile, and SAT score) explain a
statistically significant amount of the variance on persistence and (b) the addition of 10 psychosocial variables, as measured by the ACT Engage College instrument, contribute to the predictive power of the model when considering the dataset as a whole. Next, the sample was reduced to consider only Latino males. The hypotheses addressing the retention of Latino males were (a) psychosocial measures would continue to explain a significant portion of the variance and (b) the specific psychosocial scales yielding statistical significance would change according to cultural differences in the Latino population. Even though psychosocial predictability differences existed for Latino males considered alone, the difference involved no psychosocial measures demonstrating statistical significance, causing the validity of the ACT Engage College assessment for students across non-White cultural backgrounds to come into question.

The research surrounding the use of SAT scores and high school GPA in predicting retention has provided mixed results. Some researchers found no statistically significant associations can be inferred when these variables are considered collectively (Friedman & Mandel, 2011; Murtaugh, Burns, & Schuster, 1999); some found high school GPA to be a stronger predictor over SAT score (Kahn & Nauta, 2001); and other researchers have found these two variables to be stronger predictors of academic performance than persistence (Moffat, 1993; Wolfe & Johnson, 1995; Zheng, Saunders, Shelley, & Whalen, 2002). Because not every record in the dataset had an SAT score or an ACT score that could be converted to an SAT score, nor did every record have a high school GPA, the inclusion of both variables allowed for a more robust cognitive framework for consideration and reduced limitations that might be related to missing data.
Findings indicated that both SAT score and high school quartile explained a statistically significant portion of the variance in the predictive model when considering the entire sample of 8,091 students. Within the first model that considered background predictive variables for the entire dataset, findings suggested that for every one point increase in SAT score, a very modest increase in retention would occur (0.1% increase, \( p < .01 \)). Within this same model, students in the second, third, and fourth high school quartiles had a significantly lower chance of being retained than their peers from the top quarter. Specifically, compared to top quarter students, second quarter students were 1.5% less likely to be retained, third quarter students are 1.85% less likely to be retained, and fourth quarter students are 2.1% less likely to be retained. The no high school rank category did not produce statistical significance. These findings suggest that concentrating intervention efforts on second quarter students may produce higher gains in retention than focusing such efforts toward third and fourth quarter students.

In the second model in which SAT score and high school quartiles were control variables, the results were similar to the first model, except that fourth quarter students no longer demonstrated statistical significance against top-ranked students in terms of retention. Second quarter students were 1.4 times less likely to be retained, and third quarter students were 1.6 times less likely to be retained their top quarter counterparts.

When the models were rerun considering only Latino males, in both models, only second and third quarter students produced statistically significant results. The second quarter Latino males were 1.7% less likely to be retained than their top quarter counterparts, and third quarter Latino male students were 2.5% less likely to be retained. These findings reiterate the
idea that targeting second quarter students for intervention may yield a higher gain in retention. SAT score did not prove to significantly contribute to the variance in the Latino male retention model. These results reinforce the findings of Hoffman and Lowitzki (2005) who focused to the Latino population, exclusive of gender status, and found that SAT score did not have a statistically significant impact when considering their retention, but their high school GPAs did show significance for predicting Latinos’ retention.

For the first two research questions considering the dataset as a whole, the only ethnicity, compared to White students, producing statistically significant results were students identified as Asian and Pacific Islander. Within the first model, this population group was 55% more likely to be retained than White students. In the second model in which the 10 psychosocial variables were included, they were 53% more likely to be retained. This finding was not surprising, because nationally, Asian/Pacific Islander students have higher graduation rates from public four-year institutions than any other race or ethnicity (NCES, 2014). The fact that no other ethnicity produced significant findings suggested that ethnicity must be individually considered when developing predictive models.

Gender explained a statistically significant portion of the variance in the first model only when the background predictors were included in the logistic regression model. Within this first model, females were 21% more likely to be retained than their female counterparts. This finding is similar to what national statistics have also found. The College Board (2004) noted that women are 4 to 10 times more likely to graduate than their male counterparts. This statistic is compounded when ethnicity is added to the equation. The current finding about males being more likely to be retained suggests that it may be better to look at gender differences once
college data can be obtained and without sole reliance on precollege data. This recommendation is fueled by the finding that once the 10 psychosocial measures were added to the second logistic regression model, gender no longer produced statistically significant results.

Psychosocial measures were finally added to the model, after controlling for gender, ethnicity, SAT score, and high school quartile, to address the second research question. Within this model, only five of the 10 scales produced statistically significant results: (a) Commitment to College, (b) Academic Discipline, (c) Social Activity, (d) Social Connection, and (e) Academic Self-Confidence. Two of these scales fell within the motivation domain, two were in the student engagement domain, and one was part of the self-regulation domain.

Within the motivation domain, for every one standard deviation increase in a Commitment to College score, or a student’s willingness to complete college, the student’s chance to be retained increased 19.5%. With one standard deviation increase in an Academic Discipline score, or a student’s willingness to exert effort into their academics, a student’s likelihood of being retained increased by 16.8%. General Determination, Goal Striving, Communication Skills, and Study Skills did not show significant results.

Within the social engagement domain, both scales associated with this domain were found to explain a statistically significant portion of the variance in the model but not in the anticipated manner. Social Activity, defined as a student’s perceived comfort in meeting and interacting with other students (ACT, 2012), inversely impacted retention ($OR = .916, p < .01$). Social Connection, defined as a student’s perceived perception of involvement and connection to the academic community (ACT, 2012), had a positive influence on retention ($OR = 1.128, p < .01$). This finding supports previous research involving a threshold at which students become
overly involved which negatively impacts retention, but this threshold might differ depending on a student’s academic preparation (Kuh, Kinzie, Buckley, Bridges, & Hayek, 2006). It is understandable that excessive involvement, or perceived level of involvement, might distract students from completing purposeful educational activities and might negatively impact retention. It is interesting that a student’s social engagement can be predicted even before the students starts his or her college career.

Within self-regulation domain, only Academic Self-Confidence, which measured students’ beliefs that they can do well in school (ACT, 2012), explained a significant portion of the variance and inversely impacted retention ($OR = .910, p < .01$). This inverse effect could be attributed to students being overconfident in their overall ability to be successful in college. Several studies have found that students tend to overestimate their abilities to perform on tests (Burson, Larrick, & Klayman, 2006; Hacker, Bol, & Bahbahani, 2000). Additionally, for those students with below average academic credentials, this overconfidence can be exacerbated (Hacker et al., 2000; Miller & Geraci, 2011). Because the Engage College survey data were obtained during the freshman orientation program and taken from students prior to them ever attending college classes on the campus or reviewing a syllabus to see academic requirements, their perceptions of how well they would do academically were likely based on how well they perceived their high school performance.

There appeared to be value added to the predictive model when considering the dataset as a whole. However, once Latino males were the only students represented the logistic regression modeling, the 10 psychosocial measures did not appear to add to the variance the model accounted for. None of the ACT Engage College psychosocial scales produced statistical
This finding supports what Kahn and Nauta found in 2001 when they hypothesized that higher levels of social cognitive measures would predict Latino students’ persistence. Kahn and Nauta ultimately found that precollege measures did not produce statistically significant results for predicting Latinos’ first-year retention, but social measures taken during the second semester of college explained a significant portion of the retention variance. It is reasonable to expect measures taken in the second semester of college to better predict first-year retention because less time passes between the assessment and the actual act of persisting through the first year. At that point, students have gained a sense of how they are doing academically and if they are likely to earn the grades necessary for returning to the college the next fall or continuing to be eligible for financial aid. My findings coupled with Kahn and Nauta’s findings are important due to emphasizing the need to determine a new way to identify at-risk Latino students, particularly men, because current methods do not contribute to building a robust predictive model for this student population.

Although my findings showed similarities with those by Kahn and Nauta (2001), the current findings conflict with Allen (1999) who found that motivational factors explained a larger percentage of the variance in first-year retention and that retention models appeared to work similarly for the minority students who were compared to Caucasian students. The inference is that lumping all racial/ethnic minority categories into one group for comparison against the racial/ethnic majority group is not statistically robust.

This findings called into question the validity of the questions asked on the Engage College assessment across gender and ethnicities at the institution the data was pulled from. As
the results showed, when taken collectively, the findings can be misleading. I had hypothesized that the psychosocial measures would predict first-year retention for the Latino males. Unexpectedly, none of the Engage College psychosocial scales produced statistical significance for Latino males. Potential reasons for this finding could be explained by the questions on the Engage College assessment simply not resonating with Latino males due to cultural bias in the instrument itself. Another psychosocial issue could be taking place within this population that leads to discomfort with responding to the Engage College self-assessment.

As the overall student population that higher education institutions serve increasingly becomes more diverse, it is critically important for retention theories and assessments to resonate with the students leading the demographic shift. In the US, and particularly the region from which the current data were drawn, Latinos represent the fastest growing demographic (Ennis et al., 2011). If the US is ever to regain the top ranking in the world for college degree attainment, the Latino population will have to earn 5.5 million more degrees than they are expected to earn by 2020 (Santiago & Galdeano, 2014). The issues of retention and persistence, let alone the fact that this country has transition larger quantities of Latino students to college annually, heighten the need to develop early identification and warning systems for the Latino students, and males in particular, who do make it into the higher education pipeline. If administrators cannot identify at-risk students very early in the college experience, the ability to retain them decreases.

Perna and Thomas (2006) explained in their theoretical model that 10 success indicators contribute to students’ completion of college or maximization of success. The two indicators pertinent to the successful student are academic preparation, as measured by SAT score and
high school GPA, and college achievement, as measured by first-year persistence. Perna and Thomas concluded academic preparation to be helpful in predicting first-year retention as the first major milestone of college completion. While the nuances of the high school rank quartile may differ by model, the findings confirmed the need to include high school GPA in prediction models used for retention studies. SAT score, as other researchers found, might be better suited only for predicting academic achievement within the first year of college and not for predicting retention into the second year of college (Friedman & Mandel, 2011). A potential justification for this argument involves standardized tests, like the SAT, as representing one singular measure of students’ cognitive ability, whereas high school GPA is a cumulative total of a student’s academic work across all years of high school. The longitudinal characteristic of high school GPA might be a better indicator of a student’s academic behaviors across time in college.

The current findings reinforce the defining characteristics of the Perna and Thomas (2006) model because of their proposal that student success is shaped by multiple layers of context and varies both by student and across groups. My findings reinforce the likelihood of a single prediction model not existing for all students. Although it would be impossible to develop a single model for all students, it is possible to narrow the focus by gender and ethnicity.

Due to so few measures explaining a statistically significant portion of the retention variance for Latino males, the models were rerun to determine if similar results would be found for all Latino students, not just males. When the Latino students’ logistic regression models were developed, second and third quartile status as well as SAT score demonstrated statistical significance, but none of the 10 Engage College psychosocial scales explained a significant portion of the variance unlike when this model was run for the entire sample of all freshmen.
This finding highlights the need to consider gender separately, just as various ethnicities should be targeted individually.

The college student retention literature has shown that what happens in college matters more than what happens prior to college in terms of student retention and academic achievement (Kahn & Nauta, 2001; St. John, Hu, Simmons, & Musoba, 2001). However, the ACT Engage College represents a valuable assessment that provides a starting place for building a predictive model that can lead to early intervention for at-risk students. In today’s college environment, administrators need early predictive factors to identify those who may be at-risk so that targeted interventions can be employed early on in the college experience, before a student begins the departure process, whether mentally or physically.

This study showed that the inclusion of cognitive and psychosocial factors in the predictive modeling of retention can be beneficial to understanding college students’ persistence. That being said, what psychosocial factors and the weight given to each factor should be considered, along with the student’s racial/ethnic and cultural background. The psychosocial scales of Commitment to College (OR = 1.006, p < .01), Academic Discipline (OR = 1.005, p < .01), Social Activity (OR = .997, p < .01), Social Connection (OR = 1.004, p < .01), and Academic Self-Confidence (OR = .997, p < .01) provided predictive ability for a large sample of students. Two of these scales fell within the motivation domain, two were in the student engagement domain, and one was part of the self-regulation domain. The five statistically significant predictors provide important fuel for designing interventions. The findings showed for Latino males, in particular, other psychosocial measures outside of those simply measured by ACT Engage College may better predict their retention. In recent studies, Well (2008) and
Strayhorn (2010) found that social and cultural capital may be more likely to explain a significant amount of the variance for Latino males.

It should not go unstated that several limitations affected my investigation. First, it relied heavily on self-reported data; the only exception was cognitive and actual persistence data obtained by IR. Self-reported data can often be subject to social bias, as students respond in a way they believe they should, which may, or may not, align with actual beliefs. Additionally, the fact that students completed the ACT Engage College instrument in close proximity to their peers during their orientation experience could have heightened this bias.

Three data restrictions affected the findings. First, intricacies within each race and ethnicity were not accounted for. Latino was considered holistically and did not consider origin differences that exist among this population group. Secondly, because many high schools have moved away from the standard four-point GPA system, it was difficult to use high school GPA as a standardized academic achievement measure. As such, high school quartile was used over actual GPA. Thirdly, only freshmen who just recently graduated from high school limited the definition of first-year student. Freshman who took a semester or more off or were at a community college were not considered because they did not attend the full freshman orientation program, like students who enrolled straight from high school.

Another limitation related to the administrations of the ACT Engage College assessment being different between 2009, 2010, and 2011, even though the assessment was always part of the freshman orientation program. ACT recommends students have 30 minutes to respond to the survey, and in 2009, due to various logistical issues, students did not receive the full 30 minutes to respond. In 2010 and 2011, changes were made to the freshman orientation
program to allow the survey to be completed as part of the academic advising session, which allowed for more time.

The last limitation was that the data was pulled from a single institution, across three years. Although these limitations could not be overcome, they did not appear to have a significant impact on the results.

Retention efforts on college campuses are likely to increase, especially given the loss of income institutions endure with every student leaver and the external pressures from accrediting agencies and policymakers. It is unlikely a silver bullet exists to identify at-risk students across populations of students and across institutional types and locations. However, administrators would benefit from empirically testing instruments and prediction formulas using their own student populations as part of the effort to improve retention even slightly.

Unfortunately, not all ACT Engage College psychosocial scales explained a significant amount of the variance when considering as a collection of all students from a variety of backgrounds and academic abilities. None of the ACT Engage College psychosocial scales displayed statistical significance for predicting a sample of only Latino males. In situations such as this, institutional researchers may want to weight the statistically significant scales more heavily as part of developing a formula for identifying at-risk students. I recommend combining psychosocial measures and social and cultural capital variables in order to explain more Latino male retention variance using institutions with a significant portion of the student population demonstrating high financial need in the future. Future researchers are encouraged to consider more sophisticated data mining techniques as part of creating a better fitting retention model for specific campuses or student populations.
These recommendations are also calls to action for companies selling assessments to higher education institutions seeking to identify their at-risk populations early in the college experience. In the case of the ACT Engage College, in addition to precollege cognitive factors and scores across the psychosocial measures being used to develop a retention and academic index, demographic factors like gender and ethnicity do need to be included. More research is needed to understand the individual differences that exist across the demographic variables. The demographics of institutions have become far too diverse to consider student populations in a homogenous way any longer. With each new study, retention models can be developed that better explain the variance in persistence.

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APPENDIX A

EXTENDED INTRODUCTION
Introduction to the Problem

College enrollment has grown exponentially since 1945 when higher education moved into an era of massive expansion and academic standardization (Greiger, 2005). However, retention and graduation of college students, particularly across ethnic minorities and males, has not kept pace with enrollment growth. Each year, faculty and staff at institutions across the US are faced with the challenge of retaining first-year students, and often they find students entering college under-prepared for the academic rigor expected at the college level or simply unable to balance coursework, relationships, and, for many, work. These students are labeled as at-risk and can significantly impact an institution’s first-year to second-year retention rate.

One specific subset of at-risk students gaining attention from institutional administrators and policy makers across the country are racial/ethnic minority males. The discrepancy in the male minority students’ college success, compared to Caucasians and minority females, impacts these students’ ability to reach the ultimate college milestone of college completion. Initiatives, such as President Obama’s My Brother’s Keeper, have been launched to narrow the opportunity gaps for men of color (Office of the Press Secretary of the White House, 2014) and have helped to keep these populations in the limelight.

Some policy makers have argued that the success of minority males has become an educational crisis requiring immediate attention (College Board, 2010). One subgroup of minority males gaining national concern given this population’s growth pattern is represented by Latino males. Because the number of Latino males who make it to college at all is dismal, retaining and graduating them becomes even more critical from a policy point of view. Increasingly administrators have begun to focus retention and intervention efforts on male
students because of the persistence and completion disparity observed between the genders. According to the College Board (2010), the degree completion rates for females are 4% to 10% higher than the completion rates for males. This achievement gap is compounded by the completion differences between ethnic groups.

Although success in college may be considered by indicators such as college grade point average (GPA) and pace of progression, one of the most indicative signs of college completion or success is persistence from the first year of college to the second year. To illustrate the current problem, the National Center for Public Policy and Higher Education (2004) reported for every 100 ninth graders, 68 actually graduate from high school. Of those 68 graduates, 40 immediately enter an institution of higher education, but only 27 will remain enrolled to the second year. These frequencies become even more alarming with the fact that only 18 out of the 68 high school graduates will obtain a college degree within six years. The severity of losing students is highlighted by the fact that, “only 15% to 25% of all institutional departures arise because of academic failure” (Tinto, 1993, pp. 81-82).

College drop-out not only impacts students but also leads to serious financial cost for institutions and local economies. Research and information surrounding first-year retention has gained more attention than any other issue from college and university administrators in the last 20 years (Barefoot, 2004). It has been considered through lenses including predisposing characteristics such as gender, ethnicity, high school GPA, standardized test scores, etc. and program-related features such as first-year seminar, living learning communities, supplemental instruction, etc. Although the available research is substantial, the nation’s high first-year attrition rate remains one of the most significant issues challenging college administrators (Kahn
The interest in first-year retention in colleges and universities is often driven by economical, ethical, and institutional motives (Ishler & Upcraft, 2005). Through the perspective of college administrators, retaining students causes sustained or increased enrollment as well as increased income. Given this relationship between retention and tuition revenue, administrators, faculty, and staff alike have shown a vested interest in the success and retention efforts of students, and many higher education leaders seek external support to identify at-risk students so that appropriate interventions can be developed and implemented. Even though this financial motivation for retention is more of an internal, institutional concern, the long-term economic impact for students who fail to be retained or complete a college degree is quite significant, and lack of college completion, most often, leads to reduced earning power and increased reliance on governmental programs.

Earning Power and Reliance on Governmental Programs

Today, as many as four-fifths of high school graduates need at least some form of a college education in order to be self-sufficient in a complex society (McCabe, 2000). The earning power of a college graduate, compared to an individual with merely a high school diploma is significant. To illustrate, the College Board (2012) recently reported that the medium income for a family headed by someone with a four-year college degree was $100,096, which was twice the medium income for those headed by only a high school diploma. Over the course of a lifetime, a person with a college degree is expected to make $2.3 million on average, whereas an individual with only a high school diploma is likely earn only $1.3 million over his or her lifetime (Carnevale, Rose, & Cheach, 2011).
Pascarella and Terenzini (2005) found a strong and positive relationship between educational attainment and various measures of health, which included life-expectancy rates, self-evaluation of health status, and physiological indicators of health. This relationship was evident regardless of whether individuals or groups were studied. Other studies have supported Pascarella and Terenzini’s finding even when differences in income, wealth, and race or ethnicity are accounted for (College Board, 2005). When reviewing the statistics on college achievement, the personal gains that can be achieved through a college education are indisputable. The challenge for higher education leaders is the average college freshmen tends not to be developmentally ready to grasp the long-term effects of persevering during college. First time in college students can often see only the short term experiences right in front of them and are likely not to think in terms of long term gains or delayed gratification.

Gender and Racial/Ethnical Disparity in Higher Education

Despite the fact that higher education systems were developed with men in mind (Greiger, 2005), increasingly administrators focus efforts on male students because of the persistence and completion disparity observed between the genders. According to the College Board (2010), the degree completion rates for females are 4% to 10% higher than the completion rates for males. This achievement gap is compounded by the completion differences between ethnic groups.

The Latino population is the fastest growing ethnic group with approximately one in every six Americans being part of this demographic (Ennis, Rios-Vargas, & Albert, 2011). This growth rate represents a 45% growth in the ethnic population within a 10-year period (Pew Hispanic Center, 2011). At this rate of growth, it is predicted that the Latino population will
become a majority group within the US population and drive labor force growth (Sáenz & Ponjuan, 2011).

Despite the significant growth in the Latino population, educational attainment of this group has lagged. Even though more Latino students enter college, their completion rates have only modestly increased. From 2009 to 2010, Latino college enrollment grew 24%, a single year gain no other ethnic group experienced (Fry, 2011). As Latino enrollments increased, only 13% of Latinos 25 to 29 years old completed a college degree (National Center for Education Statistics [NCES], 2010). In 2009, of the degrees awarded to Latinos, 62.2% were awarded to Latina women (NCES, 2010). Although the gender gap is evident by these statistics, the gender gap that exists in higher education, particularly with the Latino population has “largely gone unnoticed and under-examined by policy makers and educational leaders” (Sáenz & Ponjuan, 2011, p. 4). Therefore, if the educational gap for Latino students is not reduced as the U.S. Latino population percentage increases, the national educational attainment rates will ultimately decrease.

Statement of the Problem

Latino male students’ college success is currently a national challenge, but more concerning is the fact that their lack of college success is likely to become more problematic given the projected growth in Latino population. It is time for policy makers, college and university administrators, and faculty alike to start making changes. Before change can occur, however, greater understanding of this problem is needed. Currently, little empirical evidence exists to better understand the factors that might contribute to Latino male persistence. In 2011, after a review of the Census data and educational statistics for the Latino population,
Sáenz and Ponjuan (2011) developed Blueprint for Action in hopes of improving the educational outcomes for Latino males. First on their blueprint is the need to create awareness on this issue. Although college completion is the ultimate goal for a college freshman, the first indicator of college success is persistence from the first- to second-year of college as 57% of all dropouts from universities occur between the first and second year (Tinto, 1996). The purpose of this study was to investigate and predict Latino male student retention using ACT’s Engage College survey at a single research university. This task was accomplished by using the survey results and student retention data from a four-year institution located in the Southwest region of the US. I hoped the results of this study would lead to increased awareness of the college success process for the Latino male student. The results were expected to help policy makers, higher education administrators, and faculty create effective policies and practices toward improving Latino males’ college success.

Research Questions

In response to the problems described above, the following research questions guided the study:

1. Are there statistically significant relationships between a first-year student’s likelihood to persist at a four-year postsecondary institution and the student’s SAT score, high school academic achievement as measured by quartile ranking, gender, and race/ethnicity?

2. Are there statistically significant relationships between a first-year student’s likelihood to persist at a four-year postsecondary institution and the student’s motivational and skills scores, social engagement scores, and self-regulation scores,
which were all measured by the ACT Engage College survey, after controlled for the student’s SAT score, high school academic achievement as measured by quartile ranking, gender, and race/ethnicity?

3. Are there statistically significant relationships between a first-year Latino male student’s likelihood to persist at a four-year postsecondary institution and the student’s motivational and skills scores, social engagement scores, and self-regulation scores, which were all measured by the ACT Engage College survey, after controlled for the student’s SAT score and high school academic achievement as measured by quartile ranking?

My hypothesis was that similar to research conducted through various studies, SAT score, high school academic achievement, gender, and race/ethnicity would explain a statistically significant amount of the variance in student persistence. Once the ACT Engage College scores were added to the baseline model, I believed the ACT Engage College psychosocial scales would explain some of the variance of a student’s persistence. However, once Latino male students were singled out, I expected the results to be different from the overall population because of cultural differences in the Latino population.

Limitations, Assumptions, and Delimitations

Several limitations affected the findings. First, the data were self-reported data, which can often be subject to social bias as students respond according to what they believe they are expected to report. The second limitation is that students completed this survey during their freshman orientation programs and were in close proximity to their peers. The students might have felt pressure to respond a certain way or fear being judged if they answered truthfully.
Nonetheless, no empirical evidence currently exists to indicate social bias is present in the ACT Engage College instrument. Therefore, I undertook the study with the assumption that students responded honestly and independently, taking into account their current state of mind.

Data restrictions did not allow for the study of the intricacies of retention within each race and ethnicity. For example, the category of *Latino* was considered holistically in the data analysis and did not represent origin differences that exist among this population group. Although cultural differences are apparent across the various origins of the Latino population (Mexicans, Puerto Ricans, Cubans, etc.) and many of these differences can impact a student’s integration into the college environment, such individual differences remained aggregated. Similar to other studies, I analyzed a single grouping of Latinos without giving specific consideration to any within-ethnicity culture differences.

Similarly, lack of standardization in GPA scales across high schools complicated the ability to use data for actual high school GPAs. Many high schools have moved away from the standard 4-point GPA system, and it has become difficult to use high school GPA as a standardized academic achievement measure. I used high school quartiles in an effort to still capture the effect of academic performance in high school on persistence. Additionally, the inclusion of only freshmen who just recently graduated from high school provided a limiting definition of a first time in college student. Freshmen who took a semester or more off from any type of school enrollment or who were enrolled at a community college were not included in the data. Because the data were secondary, it was not possible to control for the institution’s definition of a college freshman.

Lastly, the ACT Engage College survey was administered in different settings for students
in 2009, 2010, and 2011. ACT recommended providing students with 30 minutes to respond to the 108-item survey. Although all students completed the survey during freshman orientation, students in 2009 received less than 30 minutes to complete the survey because of various logistical issues. To solve this problem, in 2010 and 2011, the administration of the ACT Engage College was rescheduled to be part of the academic advising session. This programmatic change ensured students had 30 minutes to complete the ACT Engage College instrument in small group settings. Although this limitation could not be overcome given resource constraints, I do not believe it caused significant impact on the results.

Definition of Terms

Given the broadness of terms used throughout this study, the operational definitions of specific key terms are provided in this section.

*Freshman, or first-year, student.* For purposes of this study, the freshman or first-year student was defined as a first time in college student who just graduated from high school, regardless of transfer hours from dual credit, advanced placement credit, or other similar types of credit. Students who had already enrolled in college for at least one semester after high school graduation were not considered as part of this definition.

*Latino.* This definition of Latino was applied to this study based on the 2010 U.S. Census (Ennis et al., 2011). The term of Latino represented students who self-identified as being of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.

*Student persistence.* For purposes of this study, student persistence was measured by a student’s matriculation at the same postsecondary institution from fall semester to fall
semester following the institution’s census date for enrollment certification.

*High school academic achievement.* For purposes of this study, a student’s high school quartile ranking was used as the indicator of high school academic achievement. I chose quartile ranking over high school GPA because the accessibility of data and the lack of standardization in GPA calculations between high schools. Quartiles were also used in place of percentile points to reduce degrees of freedom the data analysis.
APPENDIX B

EXTENDED THEORETICAL FRAMEWORK
Introduction

College and university administrators have become increasingly interested in retention since the mid-1980s (Barefoot, 2004). As a result of this attention, the study of student retention has become a big business nationally (Tinto, 2006), and researchers have sought to develop the one-best model to explain why students leave or dropout of their respective colleges and universities (Astin, 1975; Bean, 1982; Lewin, 1951; Spady, 1970; Tinto, 1975, 1987). Newer retention models have expanded begun to include cultural influences and institutional characteristics (Kuh & Love, 2004; Nora & Cabrera, 1996).

Through a study commissioned by the National Postsecondary Education Cooperative (NPEC), Perna and Thomas (2006) sought to develop a conceptual model for understand student success in a format that could reduce the gaps in success across income, class, and racial and ethnic groups. Unlike other retention models, Perna and Thomas presented their model with the intention of developing approaches to improve student success rather than develop a singular theory for describing the college student experience. Perna and Thomas’ model provided the theoretical framework for the current study. (Refer to Figure 1 for Perna and Thomas’s conceptual model for student success.)

Conceptual Model

Central to the conceptual framework is Perna and Thomas’ (2006) definition of student success as “the completion or maximization” (p. 4) of four key transitions in the college student experience. The transitions involved the following: (a) college readiness, (b) college enrollment, (c) college achievement, and (d) postcollege attainment. Within these four key transitions are the following 10 success indicators: (a) educational aspirations, (b) academic preparation, (c)
college access, (d) college choice, (e) academic performance, (f) transfer, (g) persistence, (h) postbaccalaureate enrollment, (i) future income, and (j) educational attainment. Indicators central to my study included factors falling under college readiness. The applicable college readiness factors were academic preparation, college achievement, and persistence. The defining characteristics of the model used for the theoretical framework of this study included student success as a longitudinal process, student success being shaped by multiple layers of context, and variability of the contribution to success by student and across groups.

Student Success as a Longitudinal Process

Perna and Thomas (2006) addressed four key transitions experienced by the successful student navigating the path of college success. The first transition requires college readiness prior to actual college enrollment and is later followed by degree completion and life after graduation. A key component of the second transition of college enrollment is the persistence success indicator which was central to the study.

Student Success Shaped by Multiple Layers of Context

In Perna and Thomas’ (2006) model, success is viewed ultimately as a product of the student’s internal and external context. The decisions that the student makes are not only shaped by their characteristics but also by their life experiences. The decisions the student makes throughout the group of transitions cannot be fully understood without considering all of the internal and external contexts.

Success Varies Across Students and by Student Group

The path to student success is multifaceted. Just as college success is contingent on the internal and external contexts, how the student reaches success depends on all of these
contexts. Differences in culture, family and community resources and supports, and economic and social conditions shape how each student responds to various situations. I explored this characteristic by examining gender and ethnicity differences in relation to persistence patterns.

Layers of the Model

Given the defining characteristics just discussed, Perna and Thomas (2006) proposed four layers that explain or contribute to student success. The four layers are internal context, family context, school context, and social, economic, and policy context. While all four layers are important for understanding the comprehensive nature of student success, the first level of internal context is most closely related to the factors I considered. At this first level, the key determinants to student success are the cognitive and motivational processes that shape students’ behaviors throughout all four transitions. In this first level of internal context, the psychosocial factors, such as motivation, are actively experienced by the student. Additionally, how students perceive the path to student success is progressing.

Therefore, I utilized the theoretical framework of Perna and Thomas (2006) to better investigate the factors likely to contribute to first-year students’ persistence patterns. I gave particular attention to the persistence of Latino males. I obtained the data for understanding persistence patterns using the students’ reports prior to the start of college, at the start of the fall semester, and immediately following the first-year of college.
Introduction

The following literature review outlines previous studies on the causes of student departure from an institution, as well as specific factors that may contribute to the reasons a student may choose to persist or leave an institution. Research literature on the following college persistence factors were studied: (a) motivational factors, most notably self-efficacy, (b) engagement in the college experience, (c) typical cognitive factors considered in retention (test scores and high school grade point average (GPA)), (d) ethnic differences, and (e) gender differences.

College Student Retention

College student retention has been studied through two primary frameworks; (a) a macro scope that has looked at the causes of retention and the factors that might help predict retention, and (b) a micro scope that has focused on specific interventions that are believed to impact retention. Regardless of the landscape, at the center of the research are the theories that explain the causes of departure.

The introductions of Tinto’s (1975, 1987, 1993) student integration theory and Bean’s (1980, 1981, 1985) student attrition model ignited interest in the study of retention that has endured over time. While these models have been widely argued and studied (Bean, 1981; Braxton, 2000; Braxton, Hirschy, & McClendon, 2004; Cabrera, Castaneda, Nora, & Hengstler, 1992), they remain central to higher education administrators’ understanding of student departure. Tinto’s (1975) model of student integration was developed in response to the failure of the literature to delineate among multiple dimensions of dropout. Tinto pointed out two major shortcomings in previous research: (a) lack of a common definition of what constituted
departure (academic failure or voluntary withdrawal) and (b) lack of a model to offer explanation for departure. Utilizing Durkheim’s theory of suicide, which postulated that suicide became an option when a person was not sufficiently integrated into the fabric of society, either through moral integration or collective affiliation, Tinto sought to model the voluntary withdrawal from college as a social process.

At the forefront of Tinto’s (1975) model was the separation between the academic and social domains of the college setting because these represent two separate systems within an institution. This delineation suggested that integration within these systems is exclusive and not contingent upon one another. Tinto further proposed that because of the variance between individuals that may affect how they integrate into one of these domains, the model must be descriptive and account for the varying types of dropout. Similarly, the model had to account for background characteristics and the motivational attributes a student brought with them to the setting to understand drop out behaviors. These represented the conditions unto which dropout may occur. In short, Tinto argued the following:

The process of dropout from college can be viewed as a longitudinal process of interactions between the individual and the academic and social systems of the college during which a person’s experiences in those systems (as measured by normative and structural integration) continually modify his [sic] goal and institutional commitments in ways which lead to persistence and/or to varying forms of support. (p. 94)

Put another way, each student enters the college system with unique characteristics, and these characteristics directly and indirectly affect the student’s performance and continuation at that institution. Ultimately, it is the interplay between a student’s commitment to the goal of
completing college and to the institution that eventually decides if a student will remain.

Missing from this model is the influence of external factors on the decision to persist. Tinto believed that external factors affect the integration to the systems of a college and most likely would be observed through changes in students’ changing commitments to the institution. At the heart of the process is Tinto’s concept of “perceptions of reality” (p. 98) that affect students’ intentions to persist.

Tinto (1982) recognized the limitations of his theory by admitting that his model did not sufficiently emphasize the impact of finance on a student’s decision to stay or leave college. Tinto’s theory also did not distinguish those students who transfer or permanently drop out, and it did not bring attention to the differences in education experiences across gender, ethnicity, and socioeconomic status. Finally, Tinto’s theory lacked sensitivity to the disengagement in the academic or social aspects of the college experience that can occur at a two-year college.

In 1987, Tinto added to his original model by incorporating tenets of Van Gennep’s study of rites of passages in tribal societies to describe the stages of a student’s college experience. Although Tinto did not believe higher education consisted of rites of passages, he did believe Van Gennep’s concern for “the question of social revitalization over time and with the general problem of social stability in change of time” (Tinto, 1987, p. 91) fit within the higher education landscape. Specifically, Van Gennep’s work provided the conceptual framework for understanding the stages a student goes through as they move into the social and academic domains of their institution. According to Tinto’s revised theory, the first stage of entering college is separation, which requires students to disassociate themselves from communities of
their past (family, high school, etc.) and often leaves a student feeling isolated or
disenfranchised. These feelings interfere with their ability to persist. The second stage,
transition, comes after the separation stage, but before full adoption of the new community is
achieved. This stage affects students differently depending on how similar the past and new
communities are. Important to note is that it helps if the student has begun this stage prior to
formal entry into the new community. The last stage, incorporation, is achieved when students
have fully incorporated into the life of the college, possibly rejecting old norms and behavioral
patterns. Persistence is not ensured until the successful completion of this stage and not all
students are able to negotiate the incorporation into the institution, even when external
support is offered.

Over the last 40 years, Tinto’s theory of student integration has received many praises
and criticisms. First, previous researchers found linkages between suicidal behaviors and
student departure from college, but Bean (1981) claimed that there was not sufficient evidence
to support this premise. Specifically, Bean asserted that previous studies on student retention
lacked inclusiveness in the determinants of attrition, did not distinguish between the
determinants and the correlates of attrition, and did not pay not enough attention to the
directional causality of the variables.

As a result, Bean (1981) proposed the Student Attrition Model. By utilizing studies of
turnover in work organizations as the conceptual framework for his theory, Bean argued that
research on attrition in the workforce could be beneficial in understanding student departure
decisions. Bean included the variables of dropout, satisfaction, institutional commitment,
organizational determinants, and background in the Student Attrition Model and proposed that
organizational determinants affect satisfaction, which in turn influences a student’s desire to stay.

To test the causality of the model, Bean (1981) developed and administered a 107-item questionnaire measuring 28 variables to 2,587 first time in college freshmen from a major Midwestern institution in December 1977. Completed surveys yielded a sample size of 1,111, although only 98% of completed surveys were usable. Using multiple regression and path analysis, Bean found that although the model was useful in understanding attrition, gender differences existed. Institutional commitment is the strongest factor to predict student retention for both men ($\beta = -.29, p < .001$) and women ($\beta = -.47, p < .001$), and it was four times stronger than any other variable for women and two times stronger for men. Gender differences also exist in what variables explained a statistically significant portion of institutional commitment. For men, four variables were related to institutional commitment and they were (a) opportunity (transfer; $\beta = -.24, p < .001$), (b) institutional quality ($\beta = -.21, p < .001$), (c) development ($\beta = .15, p < .01$), and (d) communication (rules; $\beta = -.11, p < .05$). For women, in addition to the four variables above being statistically significant, five additional variables related to institutional commitment, and they were: (a) satisfaction ($\beta = .18, p < .001$), (b) campus job ($\beta = .08, p < .001$), (c) performance ($\beta = .13, p < .01$), (d) goal commitment ($\beta = .10, p < .05$), and (e) practical value ($\beta = .09, p < .05$). Although there are similarities for both males and females in what causes them to have commitment to an institution, these findings suggested that females need more institutional supports to establish institutional commitment compared to their male counterpart.

In summary, Bean (1981) affirmed that the inclusion of work organization turnover
literature was useful in studying student attrition. Bean also introduced the idea that students departed for different reasons across men and women, and he concluded that opportunity variables are important factors in institutional commitment. At the time of the study, Bean called for further research to explore the interaction effects among race, gender, and other demographic variables.

Using Bean’s (1980) original model as a foundation, Bean and Eaton (2002) enhanced it by incorporating four psychological processes that they believed led to the integration into the academic and social domains of a college setting. These processes included: (a) positive self-efficacy, (b) handling stress, (c) increasing efficacy, and (d) internal locus of control. They argued that these psychological factors ultimately shaped a student’s view of an institution and their ability to succeed at it.

Given the comprehensiveness of Tinto’s (1975) and Bean’s (1980) models of student departure and the fact that both models represented a complex set of interactions leading to student persistence over a period of time, Cabrera et al. (1992) sought to examine the convergent and discriminate validity of each theory and the extent to which these two theories could be merged together in an effort to better explain the departure decision. Cabrera et al.’s study included 2,453 freshman at a large southwestern institution. Students were asked to complete a survey during the spring semester geared toward measuring the basic tenets of both Tinto’s and Bean’s models, and 466 students completed the survey. The 466 students’ transcripts were studied to understand academic outcomes for that particular academic year. Structural equation modeling was used to test the convergence of the two theories.

Cabrera et al. (1992) promoted both theories as correct in the presumption that
persistence is a product of complex interactions and that the congruence of the student and the institution are integral to persistence. Cabrera et al. also found that, taken collectively, Tinto’s integration model tended to be more robust than Bean’s attrition model when judged in terms of hypotheses validated (70% versus 40%). On the other hand, Bean’s model accounted for more of the variance in both Intent to Persist (60% versus 36%) and Persistence (44% versus 38%), two constructs used for the investigation. The finding occurred because of Bean’s inclusion of external factors in the model. While the inclusion of external factors proved to account for more of the variance for this particular sample, Tinto’s model continues to be the most cited and tested theory related to persistence in college.

Tinto’s separation stage has also been studied in an effort to understand it at a specified point in time. Elkins, Braxton, and James (2000) sought to determine the influence of separation on first- to second-semester departure. Elkins et al. followed a three step data collection approach, using first-time in college freshmen from a single four-year public institution. The first step included gathering background data on the students through the Cooperative Institutional Research Program (CIRP) 1995 Student Information Form. This yielded a sample size of 689. Next, at the mid-point of the fall semester, the subjects were asked to complete the First Semester Collegiate Experience Survey (FSCES), which was internally developed using Tinto’s formulations of separation; 411 students successfully completed this survey. Lastly, enrollment data were pulled at the end of the spring registration period in January. Three structural equation models were estimated by regressing the three exogenous variables of support, rejection of attitudes and values, and first to second-semester retention on the six student entry characteristics of gender, race, parent income, parent education, academic aptitude, and high
school academic achievement. Findings suggested that the support factor, from parents, other family members, or peers had the strongest impact on persistence ($\beta = .28$, $p \leq .001$) within the separation stage and that ethnic minorities receive less support for college attendance. Elkins et al. believed that support impacts a student’s motivation to persist.

Although there are criticisms associated with the nuances of why a student leaves, the basic premises, as outlined in Tinto’s (1975) and Bean’s (1980) theories, are generally accepted within the field of higher education (Tinto & Pusser, 2006). While the research on retention is abundant, the literature review addresses the independent variables of my study: (a) motivation, (b) social engagement, (c) high school GPA, (d) standardized test scores, (e) ethnicity, and (f) gender, all of which have been found to impact retention, positively or negatively, depending on the individual student’s circumstance.

Psychosocial measures and motivation. Research has shown that self-efficacy, particularly academic self-efficacy, is related to academic success (Brackney & Karabenick, 1995). The capital a student brings to their college experience, whether cognitive or psychosocial, impacts their persistence in college. The tenets of this idea have become widespread. It is commonly understood that as students believe they can navigate the college experience, they become more engaged and more likely to be successful. At the root of these ideas is the impact of self-efficacy, motivation, and social engagement on success.

A student’s motivation to complete college has been widely viewed as a form of goal commitment in first-year student retention (Allen, 1999). Although the concept of motivation can take several forms, the concept of self-efficacy was the most frequently studied motivational factor and its relation to persistence in college. Bandura (1977) postulated that the
expectations of self-efficacy will ultimately determine how much effort a person will put forward in a given situation and how long he or she will endure a struggle before taking themselves out of that situation. These concepts are central to the models of retention.

Throughout the late 1970s and 1980s, the amount of literature recognizing the relevance of self-efficacy theory to predicting academic achievement swelled. In an effort to understand the collective impact of these findings, Multon, Brown, and Lent (1991) conducted a meta-analysis of 18 studies that linked self-efficacy to college persistence. The studies yielded 18 unique samples that resulted in 1,194 individual respondents. By calculating effect sizes, two major findings emerged from their analysis: (a) self-efficacy beliefs account for 12% of the variance in academic persistence and (b) effect sizes may vary across student types. These findings helped to support future studies utilizing self-efficacy as a predictive variable. Multon et al. also suggested further research seek to better understand the gender and ethnic differences that may exist when self-efficacy is considered. I attempted to do this.

Kahn and Nauta (2001) determined that although the social cognitive measures of self-efficacy, outcome expectations, and performance tended to be relevant to first-year persistence, no comprehensive study included any tests of these variables' predictive ability. In response, Kahn and Nauta utilized the Social Cognitive Career Theory (SCCT) to understand whether or not these measures would predict first-year retention, above and beyond prior academic performance or ability. They hypothesized that higher levels of these social cognitive measures would be linked to a prediction of persistence, even after controlling for high school rank, American College Test (ACT) scores, and first semester college GPA. Using a sample of 1,000 freshmen from a large, public Midwestern institution during the fall of 1998, students were
asked to complete a questionnaire one month prior to the start of the fall semester; 445 students completed this questionnaire. Respondents were then asked to complete a second questionnaire halfway through the second semester. This yielded a 62% response rate from the initial questionnaire. Applying two hierarchical logistic regression analyses, Kahn and Nauta found that, contrary to their hypothesis, precollege measures of social-cognitive factors did not statistically significantly predict retention to the second year. Instead, all three of the social cognitive measures that were obtained in the second semester added significantly to the prediction of first-year persistence, suggesting that a student is best assessed after they have acclimated to campus.

The findings of Kahn and Nauta’s (2001) study contribute to the body of literature in that they support the inclusion of psychosocial measures, such as motivation or self-efficacy in predicting first-year retention. Unlike many studies looking at similar topics, Kahn and Nauta included a timing variable. A limitation of Kahn and Nauta’s study was that students were considered as a collective whole, without consideration for gender or ethnic differences; my research provided insight on the generalizability of the social-cognitive influence across these groups.

In 2005, Zajacova, Lynch, and Espenshade sought to investigate the joint effects of self-efficacy and stress on persistence, defined by them as the third semester enrollment, by studying 107 first-semester freshmen enrolled during the spring semester of 1998 at a four-year institution within the state of New York. The make-up of the institution’s population was largely non-tradition, minority, commuter, and part-time students. Participants completed a two-part questionnaire; the first part was focused on demographic and precollege cognitive data and the
second included items geared toward measuring perceived academic self-efficacy and stress. To investigate the effects of the latent constructs (self-efficacy and stress) on persistence, structural equation modeling was employed. The effect of self-efficacy was considered both alone and in combination with stress. In both models, self-efficacy did have a positive effect on other first-year outcomes (GPA and credits earned) but did not have a statistically significant effect on third semester enrollment.

Zajacova et al. (2005) found that students’ perceptions of self-efficacy can be used in predicting college GPA and credits earned. However, self-efficacy was less predictive of actual persistence beyond the first year. This finding was contradictory to what Multon et al. (1991) concluded based on a meta-analysis. The contradiction could have been a result of Zajacova et al.’s small sample size and their sample’s diversity.

**Social Engagement**

Student engagement is a measure of success that has received attention in recent years (Kuh, 2001, 2003; Pascarella & Terenzini, 2005) and although how a student chooses to engage themselves in the social domains of an institution varies by student, research has suggested that involvement is positively related to retention when conducted at appropriate levels. Within the framework of ACT Engage College assessment, social engagement encompasses both a student’s perception of their ability and willingness to interact with the campus community, as well as their willingness to be involved in the collegiate experience.

In 2011, Hu sought to better understand the relationship between different types of student engagement and persistence in college. Participants included applicants and recipients of the Washington State Achievers (WSA) program, a scholarship program awarded to students
with a family income 35% less than the median family income and who attended a designated school within the state that consisted of large populations of low socioeconomic students. Each applicant was required to participate in a survey conducted by the National Opinion Research Center (NORC), and Hu utilized these data for the study. Students were surveyed in their first year and again in their third year, resulting in 832 participants completing both surveys. Eight items on the NORC survey were related to student engagement in college activities and using factor analysis, items were distributed among two broad categories: academic engagement and social engagement. Social engagement items were different from academic engagement items in that they dealt with activities that did not relate to the classroom experience in any way. Social engagement included participation in various campus events, whether fraternal, residence hall-affiliated, or multicultural in nature. Academic engagement included working with other students outside of class, discussing ideas from class with faculty or students outside of class, and working harder to meet faculty expectations. All eight items were based on a 5-point scale, ranging from less than once a month to more than four times a week; the midpoint was not defined.

Hu (2011) found that when student and academic engagement were considered separately, students persistence was best predicted for students with a middle-level of academic engagement (83.7% retained) and a high-level of social engagement activities (95.6% retained). However, by running a logistic regression using the scale scores of academic and social engagement as the independent variables; neither variable was a statistically significant predictor of persistence ($\beta = .046$ and $\beta=.040$, respectively). Once the engagement variables were dummy coded; however, the regression model showed that students with a middle-level
of engagement in both academic and social areas appeared to be more likely to persist than their lower and higher counterparts. Although Hu’s study was not without limitations, Hu concluded students need an appropriate balance of academic and social engagement. Some of the limitations of Hu’s study included the use of only students eligible for the WSA program and of self-report data including whether or not the student had intentions to persist.

At a national level, one of the leading ways in which these types of engagement have been explored is through the use of the National Survey of Student Engagement (NSSE) although it is not the only option in assessing involvement. The NSSE offers a robust data set to explore the effect of student engagement on academic success in college. Kuh, Kinzie, Buckley, Bridges, Hayek (2006) used NSSE data to assess the impact of five clusters of student engagement including academic challenge, active and collaborative learning, student-faculty interaction, enriching educational experiences, and supportive campus environment on college persistence, as defined by four- and six-year graduation rates. The data set included a random sample from 680 U.S. four-year institutions. Using multiple regression models, Kuh, et al. found that four of the five clusters produced statistically significant results ($p \leq .001$) when predicting retention across both four- and six-year graduation. The only cluster not significant was active and collaborative learning, but this was only true for seniors in the six-year graduation category. These findings support the inclusion of a social engagement variable in understanding retention. In fact, Kuh et al. considered social engagement’s impact during the college experience; however, I focused on students’ perceptions of engagement prior to the college experience.

Elaborating on these findings, in 2007, Kuh, Kinzie, Cruce, Shoup, and Gonyea (2007) utilized data collected through the NSSE in an effort to understand the impact of engagement
During the first year of college on returning the second year, net the effects of student background, precollege experiences, first-year academic achievement, and unmet financial need. Additionally, they studied whether or not the impact of engagement on persistence differed across racial or ethnic backgrounds. Utilizing NSSE data from 18 different degree-granting colleges and universities, in addition to institutional and ACT data, Kuh et al., ran logistic regression models to address the research questions. Institutions were purposefully selected to ensure diversity among the sample. Predominately White Institutions and Minority Serving Institutions were invited to participate, yielding a sample size of 6,000 first-year students and 5,000 seniors. Model coefficients were used to calculate a predicted probability of returning to simplify the interpretation of results. Key findings suggested that student engagement during the first year of college, even after controlling for background characteristics, has a statistically significant, positive influence on retention. To quantify this, students engaged at a level of one standard deviation below the mean were 85% likely to return the next year, 91% of students were likely to return if their engagement fell one standard deviation above the mean. Ku et al.’s findings were generalizable due to the size and diversity of the sample.

Typical Predictive Measures. There is a significant amount of literature available postulating that aptitude test scores, most notably SAT or ACT scores, and high school GPA are strong predictors of academic performance in college (Moffatt, 1993; Wolfe & Johnson, 1995; Zheng, Saunders, Shelley, & Whalen, 2002). In fact, one or both of these variables can be found in most studies about college student retention.

Utilizing both SAT/ACT scores and high school GPA, Murtaugh, Burns, and Schuster
(1999) sought to examine the relationship between high school GPA and test scores and persistence at Oregon State University. The study included 8,897 first-time freshmen who enrolled during the fall quarters from 1991 to 1995. Both univariate and multivariate analyses were run to understand the effect of each predictor individually, as well as simultaneously. High school GPA and test scores both showed statistically significant associations with persistence when considered alone, but when taken collectively, only high school GPA ($p < .0001$) proved to be statistically significant. Furthermore, as high school GPA increased, the probability that a student would persist increased significantly. These findings provided justification for the decision to include high school rank percentile in the current analysis.

Kahn and Nauta (2001) generated a comprehensive study of the use of social cognitive measures and performance measures to predict retention and found that high school rank and ACT scores both revealed a statistically significant effect ($p < .01$) on persistence when considered collectively. The results of the logistic regression indicated that when a student’s high school rank increased by one unit, the likelihood to persist from first to second year in college would increase by 2% (Kahn & Nauta, 2001). Murtaugh et al. (1999) produced a similar finding.

To better understand the effect of SAT scores on persistence, St. John, Hu, Simmons, and Musoba (2001) utilized a random sample of full-time college freshmen within the Indiana public higher education system. In order to create a more standardized view of SAT scores in order to level the playing field regardless of high school quality, a SAT merit-aware index was calculated by taking the average SAT score of a student’s high school and then subtracting the student’s actual score from it. For analysis, students’ SAT score was seen as points below or above the
mean of their high school mean SAT score. A three-step logic regression model was implemented with the first step included demographic variables, such as gender and ethnicity, the second step added college grades, and the third step looked at variables associated with the college setting, like living on-campus. While the second and third steps contained variables less relevant to my study, St. John et al.’s findings offer implications supporting my research, which is explained below. They ran their model twice, first accounting for the effect of SAT score, and after that, they ran the model with the merit-aware index.

Results from the first step revealed that SAT scores, considered alone, have a modest direct effect on retention ($\text{SAT}_A = .018, p \leq .001$). Stated another way, for every 100-point increase in SAT score, the student would be 1.8% more likely to be retained. Despite this positive effect, the second step showed that when college grades are factored in, SAT no longer has a significant effect on retention (St. John et al., 2001). St. John et al.’s (2001) finding was consistent with what Kahn and Nauta (2001) found, because after students began the college experience, college-related behaviors added more predictive value to retention modeling. Kahn and Nauta suggested that SAT scores were no longer a significant predictor of persistence when college factors were added but did show that without college behavioral measures, SAT can be useful for identifying at-risk populations.

Friedman and Mandel (2011) also studied the impact of SAT scores and high school GPA on predicting retention. Unlike much of previous research on this topic, Friedman and Mandel did not find a benefit in adding high school GPA or SAT score to a predictive model. The limited sample utilized in the study may explain this anomaly. Their study is discussed in more detail in another section of the literature review.
Findings from the above studies suggested that high school grades may provide more predictive capability than standardized test scores. Despite this finding, given this study focuses on a specific at-risk population, SAT scores were included as an independent variable in an effort to better understand gender and ethnic differences in its predictive ability, as well as create a more robust precollege cognitive measure.

Special considerations of sub-populations. Researchers have consistently found that the demographics of a student affect persistence. Of the demographics studied, most often are those related to ethnicity and gender. Kuh et al. (2007) sought to understand the effects of gender and ethnicity on retention by utilizing the results from 11,000 NSSE respondents. Key findings from Kuh et al.’s study suggested that males are less likely to return beyond the first year (83%, compared to 89% of females) and Latino males represent an even lower probability of returning (82%, compared to 87% for White males). Although African American students were found to benefit more than White students from appropriate engagement activities, there were no racial or ethnic differences with other groups.

Elmers and Pike (1997) sought to add to the body of literature considering differences between Caucasians and ethnic minorities by exploring the similarities and differences among ethnic minority and Caucasian freshmen within a theoretical framework. Elmers and Pike utilized results from the Freshman Survey, a self-report assessment designed to measure how the experiences of a freshmen influence success, and actual precollege academic measures. College success measures were not considered in this study. The administration yielded a sample of 799 first-time in college freshmen from a Midwestern university and 12% of respondents were classified as minority. Structural equation modeling was used to assess the
similarities of relationships between each ethnic group (minority or Caucasian) on each construct of the model.

Elmers and Pike (1997) found no statistically significant difference existed for students’ intent to persist. The only exceptions related to academic achievement and perceptions of the quality of education. For ethnic minorities academic achievement was not significantly related to intent to persist ($\beta = .01, p > .05$), but perceived quality of education was ($\beta = .35, p < .001$). The opposite was true for nonminority students; academic achievement had a statistically significant positive effect on persistence ($\beta = .22, p < .001$) and perceived quality of education, albeit a significant effect, was much weaker ($\beta=.09, p < .05$). These findings highlighted the importance of prior academic achievement in predicting retention for minority students. The findings also emphasized the need to diversify retention predictive models to take into account of ethnic differences.

In 1999, Allen explored the impact of precollege variables on persistence variables among minority and Caucasian college students and tested the hypotheses that motivation has a direct effect on persistence and that motivation’s effect is stronger for ethnic minorities than for Caucasians. Data were collected from 581 freshmen attending a medium-sized public, regional institution in the Southwest, and 76.1% of the sample was Caucasian, 18% Hispanic, 4.1% African American, and 1.7% Asian-American. Because of the low percentages of African American and Asian American students in the sample, Allen had to combine all minority populations into one minority category. Students were asked to complete the College Student Inventory (CSI) just prior to the start of the fall semester to provide a measure for motivation, as defined by desire to finish.
Allen (1999) utilized a two-step structural equation model with persistence serving as the dependent variable and showed differences between minorities and Caucasians in what affected retention. Motivation explained a larger percent of the variance in minority students’ persistence than for Caucasian students. Allen concluded that retention models seem to work similarly for Caucasians and minorities.

Allen’s (1999) study is relevant because higher education scholars often assume theoretical models are more relevant for the majority population. However, a shortcoming of Allen’s study was combining ethnic groups into a single category of minority in order to make the minority group large enough for comparison with number of Caucasians in the sample. Allen contributed to the line of inquiry by considering the effect of motivation (and other psychosocial variables) through a single ethnic minority group. Although ethnicity is often seen through a homogeneous lens, increasingly researchers are considering each ethnicity’s distinctiveness. Below is a summary of the growing research surrounding the Latino college student and differences that have been found between male and female students.

Latino college students. Currently, the majority of literature and research available on the Latino college student population is centered upon access rather than persistence and completion. While challenges to access have been linked to lower family income levels and parental education (Arbona & Nora, 2007; Harrell & Forney, 2003; Longerbeam, Sedlacek, & Alatorre, 2004), poor academic preparation (Ramani, Giblertson, Fox, & Provasnik, 2007), and access issues to information regarding the pathways to high education (McDonough, 1997), little empirical research has provided insight on why Latinos have more difficulty in navigating the college experience and reaching the point of successful completion (Sáenz & Ponjuan,
Utilizing responses from 99 Latino undergraduate students from a Research Type I institution in the southwest of the United States, Gloria, Castellanos, Lopez, and Rosales (2005) sought to understand the relationship between university comfort, social support, and self-belief on academic persistence decisions. Students invited to participate in the study included students involved in on-campus organizations, research programs, and introductory-type courses. Most prevalent to my study were the social support and self-belief constructs as they most closely represent ACT Engage College’s social engagement and motivation and skills domains. There were three social support scales: (a) Perceived Social Support Inventory-Family and Friends (PSS-Fa and PSS-Fr), (b) Parent Engagement Scale (PES), and (c) Mentoring Scale (MS) and three self-belief scales: (a) Rosenberg Self-Esteem Scale (RSES), (b) College Self-Efficacy Inventory (CSEI), and (c) Educational Degree Behaviors Self-Efficacy Scale (EDBSES). All scales were validated by previous studies. The criterion variable was measured by using the Persistence/Voluntary Dropout Decisions Scale (PVDDS). Gloria et al.’s PVDDS items included the following examples:

1. “I am confident I made the right decision in choosing to attend this university.”

2. “It is important to me to graduate from this university.”

To address the research questions, a series of two-step hierarchical regression analyses were conducted; statistical significance was set at .001 to control for Type II error. Results suggested that both social support and self-belief were interrelated and were predictive of academic non-persistence decisions. In terms of social support, PVDDS was related to PSS-Fa ($r = .32, p \leq .001$), PSS-Fr ($r = .50, p \leq .001$), PES ($r = .25, p \leq .01$), and MS ($r = .40, p \leq .001$), leading
to the conclusion that students who believed they had support from family, friends, parents, and/or mentors showed a statistically significant lower score on the PVDDS. Furthermore, students with an increased sense of confidence in their ability to navigate the college experience had with fewer academic non-persistence decisions (CSEI $r = .37$; EDBSES $r = .44$, $p \leq .01$).

Gloria et al.’s (2005) findings are important to review because they focused on the interrelatedness of various issues specific to the Latino population. Gloria et al. showed that the Latino student’s college experience appears to be different than the experience had by members of the larger student population. While all students likely need to feel a sense of support from various people in their lives and need to belief they can navigate the college experience, Gloria et al. suggested that Latino students may need more of these supports than their White counterparts.

Hoffman and Lowitzki (2005) wanted to further the understanding of ethnic differences by exploring a more nuanced understanding of the influence of high school GPA and test scores on student success, with particular attention paid to the Latino population. Utilizing institutional data from 522 students, persistence patterns were analyzed using structural equation modeling. Although high school GPA and SAT score tend to show a statistically significant positive influence on students’ collegiate academic success, the same trend has not been observed for retention. High school GPA demonstrated a statistically significant influence for Latino students ($\beta = .22$, $p < .05$) but not for White students ($\beta = .03, p > .05$). SAT scores did not demonstrate any statistically significant impact. These findings justified the use high school rank percentile over standardized test scores for modeling Latino student persistence behaviors. However, as stated
before, I utilized both variables to generate robust cognitive measure.

In 2007, Arbona and Nora sought to examine the characteristics believed to impact college persistence and undergraduate degree attainment among Hispanic high school graduates by using secondary data from the National Educational Longitudinal Study from 1988 to 2000. Only Hispanic students who participated in the study from 1990 to 2000 and enrolled in a two-year or four-year college in 1992 or early 1993 were considered for their study. In total, 925 Hispanic college students were included and participants were coded by whether they attained a bachelor’s degree or did not. Predictor variables included demographic, precollege, college, and environmental variables. Using logistic regression analysis, the findings showed that degree attainment within eight years of beginning college among Hispanic college students was most often influenced by the following two precollege factors: (a) parental expectations for children obtain a bachelor’s degree and (b) peers who have similar plans. Additionally, five college factors influence degree attainment as follows: (a) beginning at a four-year institution versus a two-year institution, (b) attending full-time, (c) remaining enrolled in college continuously, (d) strong academic performance in the first year, and (e) completed a larger percentage of the hours attempted. Most relevant to my study was Arbona and Nora finding about the impact of parental expectations on children to obtain a bachelor’s degree. Parental influence likely shapes students’ motivations to obtain a bachelor’s degree, given the interrelatedness of the family component in the Latino population. This impact was studied further by Wells (2008) who investigated persistence from a broader framework.

Wells (2008) sought to determine the effects of social and cultural capital on persistence utilizing data from the National Educational Longitudinal Study from 1988 to 1994. Selecting
from the dataset students who graduated from high school in 1992 and were still enrolled in college in 1994, Wells analyzed 1,310 cases using logistic regression analysis. Admittedly, minority students were underrepresented in this study. Although Wells focused on the effect of social and cultural capital on several college outcomes, most relevant to my study was Wells used of the model surrounding persistence. Wells social or cultural capital variables included the following: (a) at least one parent received a college education, (b) the student had an expectation he or she would attend college, (c) at least one parent expected the child to attend college, (d) the student knew of peers who planned to attend college, (e) the student utilized test preparation materials prior to taking the ACT or SAT, and (f) the student’s parent was involved in his or her educational life. Four of the five factors represented positive impacts on persistence by use of the odds ratio ($OR$). The only factor that showed a negative impact on persistence was having at least one parent who expected the child to attend college ($OR = 2.723$). The strongest variable predicting retention was having at least one parent attend college because these students were 179% more likely to be retained. All other variables showed positive predictive relationships, but none had this level of prediction (Wells, 2008).

Also significant from Wells’ (2008) study was the impact of social and cultural capital on the Latino population. Capital was determined by calculating a value using one or zero for categorical variables and considering percentile for continuous variables. Data showed that the Latino population, compared to Whites, African Americans, and Asians entered college with the least amount of capital (0.65, compared to figures above 0.7 for all the other ethnicities). Wells found that Latino students with lower capital upon entry to college had significantly lower probabilities of persisting. Recognizing that the Latino population is going to enter college with
less social and cultural capital is important for scholars and administrators to understand. Lower levels of capital are likely to impact students’ self-efficacy and belief about being successful in a new, unknown environment.

Bordes-Edgar, Arrendono, Kurpius, and Rund (2011) sought to examine the issue of persistence for the Latino population in a 4.5-year longitudinal study with a group of 76 Latino college students who were originally surveyed in their first semester of college. Bordes-Edgar et al. considered both traditional predictive measures and non-academic factors that included self-beliefs, social support, and academic persistence decisions to explore persistence. Most relevant to my study was Bordes-Edgar et al.‘s hypothesis that students with positive self-beliefs, social support, and academic persistence decisions would persist at higher rates than students who dropped out of higher education. Bordes-Edgar et al. used multivariate analysis and found that although self-beliefs were strongly related to academic persistence decisions, the self-beliefs variable did not predict persistence.

Recognizing that Latino college students are less likely to persist and graduate than other ethnic groups, Baker and Robnett (2012) recently delved into the experiences of Latino college student experiences to better understand what characteristics affect the retention of this population of student compared to their peers in other racial or ethnic groups. Using an internally developed survey at the institutional level, Baker and Robnett sought first responses to their survey from all first-year students from a high-achieving Western institution in the US; 1,684 first-year students initially responded. Surveys from students who did not classify themselves as White, Latino, African American, or Asian American were excluded from the data. Baker and Robnett’s (2012) final sample was 1,502, and unlike most institutions, this Western
school seemed to represent an anomaly because African American students represented the highest retention rate group. Baker and Robnett used t-tests to compare Latino college student responses to those of students from other ethnic/racial groups. They employed logistic regression analysis to understand what factors best predicted retention for Latino college students.

Baker and Robnett (2012) observed statistically significant differences in high school GPA between Latino and White students as well as significant differences between Latinos and the White and Asian American students for SAT score. Nevertheless, the logic regression showed that no precollege cognitive characteristics affected the persistence of the Latino population. Instead, similar to what Kahn and Nauta (2001) found in their study looking at the impact of social cognitive factors in predicting retention, it appeared for Baker and Robnett that what happens in college matters more to persistence. Specifically, involvement in a sports club, not studying in a group, and first semester GPA proved to be the strongest predictors of retention. A limitation of Baker and Robnett’s study was the use of a single high achieving institution for their case study. Given the different nature of the institution, additional institutions would need to be considered to broaden generalizability.

Kahn and Nauta’s (2001) findings are important, with Baker and Robnett (2012) in mind, because they are counter-intuitive to what scholars generally believe about engagement in the college experience. One of Baker and Robnett’s findings was that Latino students may be better off studying independently. Before such a bold assertion can legitimately be made, further empirical research with a larger sample size must be conducted. Research could also be furthered by considering the specific gender differences that exist across students, but more
importantly, within populations.

Strayhorn (2010) sought to further understand the influence of precollege ability, as measured by high school achievement in math and science, participation in precollege outreach programs, and social and cultural capital on academic achievement in college for Latino males, as measured by college GPA. Although Strayhorn considered African American males, most pertinent are the findings related to Latino men. Strayhorn used NCES data and identified all Latino males who attending four-year institutions. To correct for oversampling of certain groups, nonresponse bias, and sampling error, sampling weights were applied to each case, yielding 140,222 Latino males. This technique helped to minimize the effect of a large sample size on standard errors and significance tests. Utilizing hierarchical linear regression techniques, Strayhorn observed the presence of a statistically significant relationship between the independent variables and college GPA for Latino men ($F[11, 27591] = 365.30, p < .01$). Furthermore, the addition of social and cultural capital, as measured by socioeconomic status and a parent’s highest level of education, explained 6% of the variance in college GPA, above and beyond precollege achievement and preparation ($R^2 = .06, F[9, 27591] = 201.34, p < .01$). Strayhorn concluded that social and cultural capital variables add to the predictive ability for Latino men in significant ways.

Strayhorn (2010) also found that social and cultural capital explained a statistically significant amount of the variance in college GPA, similar to the finding for Latino men. However, social and cultural capital explained a higher percentage, 14%. This finding is important to my study because Strayhorn highlighted the need to consider ethnicity individually, as opposed to including Latinos in a homogenous group, in order to understand
what variables provide the greatest predictive ability for different groups of students.

Gender. Just as the number of women attending college has increased over the last several decades, so has their success rate, as compared to their male counterparts. While it appears that more research has focused on access to higher education across genders than persistence, increasingly, researchers are seeking to better understand what circumstances lend themselves to females persisting in college at higher rates than men.

Leppel (2002) had found that most persistence studies were conducted using samples from single institutions and only considered retention from a singular lens involving students persisting from one year to the next at the same institution. Leppel used a national dataset with a broad definition of persistence and considered other persistence behaviors like transfer to another institution in order to get a more complete view of persistence. Leppel pulled data from the 1990 administration of the NCES’ Beginning Postsecondary Students (BPS). Only data from four-year bachelor degree granting institutions were considered, and the sample included 2,647 men and 2,737 females. Taken collectively, 84% of respondents persisted from one year to the next, although some may have been at another institution (Leppel, 2002). Leppel used several independent variables for looking at persistence, but most relevant to my study were those related to the effect of gender on involvement. Involvement was measured through a series of questions related to participation in various social and academic engagement opportunities that included joining an organization, meeting with a faculty member, etc. through responses involving the following choices: 0 = never, 1 = once, 2 = sometimes, and 3 = often.

Leppel (2002) concluded that gender differences existed in the impact of involvement on persistence. While both males and females had higher predicted persistence rates when they
participated in various involvement opportunities at least sometimes, but persistence rates were higher for women. Interesting from this study was the discrepancy between women in men when involvement was characterized as never. For women, if involvement was in this category, predicted retention was 91%, but for men at the same level, predicted retention was only 59% (Leppel, 2002). By adding one involvement activity, the predicted persistence for men increased to 80%, a significant increase. Leppel's finding highlights the importance of including college males’ perceptions of their involvement in college when developing early persistence prediction models. Leppel’s (2002) offered valuable information about gender differences in persistence patterns. Although Leppel considered persistence on a broader level, first-year persistence is merely a starting place to continued persistence.

Using Psychosocial Measures in Retention Predictive Models. Research related to predicting college outcomes, particularly in a student’s first year has most often been centered on cognitive factors such as SAT/ACT scores, high school GPA, and socioeconomic status (SES), and the literature showed that some groups of students may be at a disadvantage in these areas. Within the last 10 years, researchers, particularly those associated with ACT, have taken a vested interest in broadening retention predictive modeling scope to include psychosocial factors. The below is a summary of recently literature surrounding these studies.

Robbins et al. (2004) pulled results from 109 studies across a 20-year period and these studies included a wide variety of research methods and reporting. Robbins et al. used meta-analysis as the primary analysis tool to examine the role of psychosocial measures with retention and GPA and the relative effect of these constructs on academic achievement and performance. However, a secondary analysis was conducted using multiple regression models
to better understand the extent to which college retention and GPA can be predicted by psychosocial factors, after controlling for traditional predictors like SES, high school GPA, and ACT/SAT scores. Controlling for these variables allowed Robbins et al. to understand the effect of the psychosocial factors above and beyond SES, high school GPA, and ACT/SAT scores.

Robbins et al. (2004) found psychosocial factors predict first-year retention above and beyond those traditional predictors. The meta-analysis results conveyed that effect sizes associated with psychosocial factors were comparable to the effect sizes of SES, high school GPA, and ACT/SAT scores (Robbins et al., 2004). Specifically, Robbins et al. found a significant correlation between psychosocial variables and college persistence with 26% of the variance explained. In addition, multiple regression models showed that factors such as academic goals, institutional commitment, social support, social involvement, academic self-efficacy, and academic-related skills were incrementally predictive of retention in a positive direction. In terms of the relationships between psychosocial factors and GPA, although positive, they only moderately impact GPA above and beyond traditional predictors.

Robbins et al.’s (2004) findings helped to build a case for the use of psychosocial factors in retention predictive model and impacted further research, particularly when multiple regression models were run as due to lack of opportunity to control for moderator effects, like institutional type or size. While size did not necessarily pertain to my study, type did matter because my data were derived from a single institution. Differential effects between two-year versus four-year and public versus private is currently unknown.

Utilizing the ACT Engage instrument to build off Robbins et al.’s 2004 study, Robbins, Allen, Casillas, Peterson, and Le (2006) examined the effects of self-reported psychosocial
factors on first-year college outcomes with institutional type used as a control variable. Specifically, Robbins et al. sought to address four primary issues: (a) psychosocial domains of motivation and skills, self-regulation, or social activity as predictors of college outcomes than other domains; (b) psychosocial factors incremental prediction over and beyond that already predicted by traditional predictive factors, such as prior academic achievement, demographics, and institutional effects; (c) interaction likelihoods with achievement or curvilinear effects of the psychosocial measures; (d) effects of psychosocial measures as similar across two-year and four-year institutions. A total of 14,464 first-year students, representing 48 institutions, completed the ACT Engage College instrument to be included in the study. The population was diverse and spanned two-year and four-year institutions, with the exception of the Latino population, which only represented 5.4% of the sample (Robbins et al., 2006).

In terms of the predictability of ACT Engage College scales on first-year retention at four-year institutions, Robbins et al. (2006) used overall odds ratios and showed that social engagement factors present the strongest predictability. Even though other self-management factors, like emotional control and academic self-confidence, offer predictability, they simply were not found to be strong of predictors as social engagement. It is understandable that Latinos were the least represented group within the Robbins et al. (2006) study given the proportion of Latinos attending college. Future studies should over sample or target this cohort of students and run the same models to see how the various ACT Engage College domains impact the same outcome variables.

In another attempt to expound on the research of Robbins et al.’s 2004 study, Gore (2006) sought “to evaluate the utility of using measures of academic self-efficacy to predict
postsecondary academic success and persistence” (p. 95) by conducting two separate studies. The first was a longitudinal study of first-year college studies following 629 freshmen during their first 2 years of college (Gore, 2006). All participants in the study were enrolled in a 3-hour freshman seminar course during their first semester and completed the College Self-Efficacy Inventory (CSEI) in the first 2 weeks of the semester and then again during the last 2 weeks of the semester. A small percentage of the students also completed the Academic Self-Confidence scale that is part of the ACT Engage College instrument. Using hierarchical linear regression to explore the addition of self-efficacy factors in predictive modeling, findings suggested that when testing for retention, CSEI and Academic Self-Confidence (ASC) scores do not add to the model (above ACT scores) when data is collected at the start of the semester, but do add to the incremental model fit when collected at the end of the semester. Adding CSEI measures to the model at the end of the first semester revealed that for every 1-point increase in the CSEI self-efficacy score, the odds a student was retained increased 22%, a very significant finding.

The consideration of the timing of data collection for predicting college outcomes in Gore’s (2006) study is worth further study because the timing conflicted with current ways of thinking. While administrators often have in mind the need to intervene with students in the first 6 weeks in order to affect college outcomes, Gore (2006) suggested a need to rethink when predictive modeling is used for freshmen, at least in terms of persistence. Findings were not consistent for predicting academic success, where both the first and last 2 weeks served added to the model (Gore, 2006).

In the second study, Gore (2006) utilized a large, national dataset of students who completed the ACT Engage College across 25 large public institutions. A total of 7,956 randomly
selected students participated in the study. Students’ ACT and ASC scores, in combination with their college academic performance and persistence from the first 2 years of college, were analyzed. Gore (2006) used hierarchical linear regression to determine the best predictive model fit included both ACT scores and ASC scores and furthered the case for considering psychosocial measures in conjunction with cognitive predictors.

While the above studies all utilized the ACT Engage College instrument to measure various aspects of a psychosocial factors, other researchers have utilized other instruments to understand the impact of psychosocial factors on student success. Friedman and Mandel (2011) employed the Needs Assessment Questionnaire (NAQ) to determine if a student’s need for psychosocial factors like achievement, affiliation, autonomy, and dominance, which were all similar constructs to some of the ACT Engage College psychosocial scales, could predict retention better than SAT scores and high school GPA. Contrary to what Robbins et al. (2004) and Gore (2006) found, Friedman and Mandel found the four needs did not predict retention via hierarchical linear regression. Friedman and Mandel found that parents’ academic achievement served as the stronger motivator for students remaining in college. These results may be limited given the major limitation of sample size. The online survey was sent to all incoming freshman at one institution \((n = 1,372)\), but the response rate was only 38%, causing the authors to consider the results not generalizable to population of 1,372 students. Should the Friedman and Mandel study be expanded to a larger population, the results might be more consistent with findings from other studies in which psychosocial factors, like motivation, were used for understanding factors that predict retention.

In 2008, Allen, Robbins, Casillas, and Oh sought to broaden the understanding of
retention and utilize the ACT Engage College instrument to better understand the effects of motivation and social connection on the third year of persistence. Utilizing ACT Engage College results combined with actual outcome data, Allen et al.’s sample included 6,872 students representing 23 four-year institutions. Students completed the ACT Engage College instrument as entering freshmen and then enrollment data were obtained during the fall of their third year in college. Allen et al. ran a hierarchical multinomial logistic regression model using third-year enrollment status serving as the criterion variable. Allen et al. found that social connectedness and motivation constructs, particularly the college commitment scale within the motivation construct, had a direct effect on still being enrolled during the third year. Furthermore, academic self-discipline, a second motivation factor, had a statistically significant positive effect on third-year persistence, but the results did not show significant differences across gender and ethnicity (Allen et al., 2008).

Allen et al.’s (2008) study added to the retention literature by including psychosocial factors, particularly the motivation and social connection constructs of the ACT Engage instrument, for predictive modeling. Although Allen et al. focused on third-year retention, the findings were still relevant to first-year retention as the first step toward degree completion. Despite the fact that Allen et al. found none of the ethnicities to have significant total effects on persisting versus dropping out, the results might have suffered from bias due to the low 7.1% response rate from the Latino population. Should a larger Latino sample be studied, the sampling bias may be eliminated.

The above studies help confirm the benefit of utilizing psychosocial factors in retention predictive modeling. While none suggest they should be used in isolation, they can be an
incremental addition to predictive models that help to identify at-risk students. The fact that Friedman and Mandel (2011) found certain motivational factors did not predict retention further emphasized the need for institutions to test various modeling strategies with their particular populations to ensure effectiveness and the use of appropriate variables.

Summary

The variables of this study involving predictive modeling of first year retention were self-efficacy, social engagement, precollege cognitive factors, gender, ethnicity, and psychosocial. Even though these variables have been widely studied in terms of access to college or persistence in college and despite the abundance of literature available, few researchers considered the combination of these variables across genders and ethnicities, including paying specific attention to Latino males. Additionally, no prior researchers suggested the need for a different predictive model for men in general or for Latino men in particular. Given the dismal success rates of the Latino male student demographic, college administrators must take notice of what is causing the male Latino dropout phenomenon. There is a need to develop mechanisms to identify the Latino males most likely to struggle and ease their college transitions as they integrate into the academic and social domains of their respective institutions. While the research literature also suggested that measures during college, like first semester GPA, appear to have greater predictive power than precollege measures, it is important for college administrators to have a mechanism to identify those at-risk students as early in the first semester as possible.

A current shortcoming of the literature involved the lack of use of psychosocial factors in predictive modeling. The majority of the findings with psychosocial variables were published by
researchers from ACT, the private company who developed and sells the ACT Engage College instrument to institutions. The review enabled incorporation of research findings into the design and analysis of data for the current study.
APPENDIX D

DETAILED METHODS
Introduction

The primary goal of this study was to investigate and predict Latino male student retention using a combination of cognitive and psychosocial factors that were measured by ACT’s Engage College instrument. The following research questions guided this study:

1. Are there statistically significant relationships between a first-year student’s likelihood to persist at a four-year postsecondary institution and the student’s SAT score, high school academic achievement as measured by percentile ranking, gender, and race/ethnicity?

2. Are there statistically significant relationships between a first-year student’s likelihood to persist at a four-year postsecondary institution and the student’s motivational and skills score, social engagement score, and self-regulation scores, which were all measured by the ACT Engage College survey, after controlled for the student’s SAT score, high school academic achievement as measured by percentile ranking, gender, and race/ethnicity?

3. Are there statistically significant relationships between a first-year Latino male student’s likelihood to persist at a four-year postsecondary institution and the student’s motivational and skills score, social engagement score, and self-regulation scores, which were all measured by the ACT Engage College survey, after controlled for the student’s SAT score and high school academic achievement as measured by percentile ranking?

Instrumentation

The data for this study came from the 2009, 2010, and 2011 administrations of the ACT
Engage College instrument (formally the Student Readiness Inventory) at the selected institution. Engage College was developed by ACT as a 108-item instrument measuring three domains over 10 psychosocial scales and the three domains were the following:

Domain 1. Motivation and skills: Personal characteristics of a student that help them succeed academically by focusing effort toward goal-driven activities. Scales under this domain included Academic Discipline, Academic Self-Confidence, Commitment to College, Communication Skills, General Determination, and Goal Striving (ACT, 2012).

Domain 2. Social engagement: Interpersonal factors that influence a student’s integration into the collegiate environment. Scales under this domain included Social Activity and Social Connection (ACT, 2012).

Domain 3. Self-regulation: Cognitive and affective capacity used to monitor, regulate, and control behavior related to learning; the belief that the student can perform well in college, which has also been linked to ideas of self-efficacy. Scales included Steadiness and Study Skills (ACT, 2012).

Collectively, the instrument’s domains enable the cognitive predictors of college success to be combined with the instruments’ 10 psychosocial predictors to provide institutional representatives information that may help them better identify at-risk students. Even though the 10 psychosocial predictors provides institutional representatives with two key indices, academic success and retention, to help them better identify at-risk students, I did not incorporate these indexes into the study. Nonetheless, the 10 individual psychosocial scale scores falling within the three domains served as the independent variables as delineated in the
Development of the items for the ACT Engage College instrument occurred during an intensive process involving several steps (ACT, 2012). First, researchers from ACT reviewed over 20 years of literature geared toward identifying at-risk students to develop a set of constructs. Once these constructs were defined, experts in the fields of education, counseling, and psychology were asked to provide feedback on the constructs. The constructs were revised as needed and a research team was charged with developing items for each construct. The initial item pool was 320.

All items were first tested with a group of 38 high school students. Revisions were made based on findings, and the item pool was narrowed to 305. Items were retested with 5,970 first-year college students and high school seniors from 49 institutions. Exploratory and confirmatory factor analyses were conducted to ensure items fit with each scale. Through the exploratory analysis, the constructs were narrowed to 10, and the confirmatory analysis narrowed the item pool to approximately 10 items per construct (ACT, 2012).

Reliability

Reliability estimates were calculated for each of the 10 scales and produced moderate to high Cronbach’s alpha coefficients ranging from .80 to .87 (ACT, 2012). See Table D.1 for the internal consistency coefficients for each ACT Engage College psychosocial scale (ACT, 2012). Given the fact that reliability coefficients are generally accepted to be satisfactory when they fall
above .7 (Vogt, 2007), and all alpha levels met this criteria, the conclusion was drawn that the
data would produce consistent results across administrations to first-year students (ACT, 2012).

Table D.1

**Reliability Coefficients for Each Engage College Psychosocial Scale**

<table>
<thead>
<tr>
<th>Psychosocial Scale</th>
<th>Cronbach α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Self Discipline</td>
<td>.83</td>
</tr>
<tr>
<td>Academic Self-Confidence</td>
<td>.83</td>
</tr>
<tr>
<td>Commitment to College</td>
<td>.85</td>
</tr>
<tr>
<td>Communication Skills</td>
<td>.82</td>
</tr>
<tr>
<td>General Determination</td>
<td>.87</td>
</tr>
<tr>
<td>Goal Striving</td>
<td>.84</td>
</tr>
<tr>
<td>Social Activity</td>
<td>.84</td>
</tr>
<tr>
<td>Social Connection</td>
<td>.80</td>
</tr>
<tr>
<td>Steadiness</td>
<td>.84</td>
</tr>
<tr>
<td>Study Skills</td>
<td>.86</td>
</tr>
</tbody>
</table>

*Note. Table adapted from ACT (2012) data for N = 14,464.*

Validity

While developing the ACT Engage College instrument, several validity tests were
conducted to better understand how the scales correlated with each other, how well some of
the ACT Engage College constructs relate to those of other inventories like the Big Five Inventory
(BFI) personality assessment, and how well the ACT Engage College served as a predictive tool
for college success. Several of the scales within the instrument correlated more strongly than
others. For example, General Determination, Academic Discipline, Goal Striving, and
Commitment to College correlated more highly to each other than some of the other scales.
Correlation coefficients for these scales ranged from .54 to .79 (ACT, 2012).
In exploring relationships between the ACT Engage College’s scales and the BFI, several convergent relationships were also found. For example, the BFI’s Neuroticism scale related to ACT Engage College’s Steadiness scale, and the BFI’s Extroversion correlated to the ACT Engage College's Social Activity scale. These relationships demonstrated the ACT Engage College’s ability to accommodate a wide variety of personality types (ACT, 2012.)

To validate the instrument further, a study was conducted to predict college outcomes in terms of overall academic performance as measured by GPA, retention, and success in specific courses (ACT, 2012). Even after controlling for institution, demographic variables, and prior academic effects, ACT Engage College scores demonstrated the ability to predict college success (ACT, 2012; refer to the review of the literature for more information). Given the outcomes of the validity assessments, the ACT Engage College demonstrated validity across demographic, institutional, and standardized achievement variables, making it a viable retention prediction tool for many college institutions (ACT, 2012; Robbins et al., 2006).

Data Collection

The ACT Engage College instrument was administered to all incoming freshmen as part of their mandatory orientation program in 2009, 2010, and 2011. Completed instruments were sent to analysts at ACT for processing by the institution’s institutional research (IR) office. Upon completion of the processing, ACT representatives within IR were able to link the ACT Engage College data with the institution’s additional student data. Each respondent’s data included gender, ethnicity, high school percentile, and enrollment data. I received all data from the institution’s IR department following Institutional Review Board (IRB) approval to conduct the study.
Within the original files obtained from the IR department, a total of 10,738 records were retrieved, but not all of them presented complete data. Once scoring abnormalities, incomplete ACT Engage College results, and records that could not be linked to actual student data were removed from the dataset, 9,584 useable records remained. Table D.2 below summarizes the data received from IR.

Table D.2

Summary of Data Received from A Southwest University’s IR Office

<table>
<thead>
<tr>
<th>Data</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total N</td>
<td>3,449</td>
<td>3,458</td>
<td>3,799</td>
</tr>
<tr>
<td>ACT Scoring Abnormalities</td>
<td>63</td>
<td>81</td>
<td>27</td>
</tr>
<tr>
<td>Incomplete Engage Survey Results</td>
<td>32</td>
<td>29</td>
<td>207</td>
</tr>
<tr>
<td>Data unable to be linked to a student</td>
<td>201</td>
<td>111</td>
<td>371</td>
</tr>
<tr>
<td>Final n for data analysis</td>
<td>3,153</td>
<td>3,237</td>
<td>3,194</td>
</tr>
</tbody>
</table>

It should be noted that due to the fact that the institution practices open enrollment, occasionally new freshman students are accepted to the university after the start of classes, although this number is very low compared to the complete freshman population. Additionally, some new freshmen bypass the orientation process and enroll based on guidance from their college’s advisors. Any student who did not complete the ACT Engage College instrument was not included in the data.

Population and Sample

The population was all new first-time in college freshmen at a four-year public university located in a southwestern state of the US and situated in a rural/urban environment who entered college during the fall semesters of 2009, 2010, and 2011. Students who attended the
university’s mandatory freshman orientation program formed the sample. The institution was classified by the Carnegie Foundation for the Advancement of Teaching as a Doctoral Research–High Research institution, granting at least 50 doctoral degrees across at least 15 disciplines annually. The institution enrolled approximately 35,000 students, and approximately 15% were Latino students. About 55% of the students were females, and 45% were males (University of North Texas, 2011). Table D.3 summarizes the demographic breakdown of the institution’s total enrollment.

Table D.3

*Demographic Breakdown of Institution Enrollment by Year*

<table>
<thead>
<tr>
<th>Demographic Variable</th>
<th>2009 %</th>
<th>2010 %</th>
<th>2011 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Institutional Enrollment N</td>
<td>36,123</td>
<td>36,067</td>
<td>35,694</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>62.20</td>
<td>60.60</td>
<td>58.10</td>
</tr>
<tr>
<td>Latino</td>
<td>12.80</td>
<td>14.00</td>
<td>15.50</td>
</tr>
<tr>
<td>African American</td>
<td>13.20</td>
<td>12.10</td>
<td>12.70</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>5.45</td>
<td>5.81</td>
<td>6.08</td>
</tr>
<tr>
<td>American Indian/Alaskan</td>
<td>0.71</td>
<td>1.24</td>
<td>1.38</td>
</tr>
<tr>
<td>Nonresident/International</td>
<td>4.74</td>
<td>4.88</td>
<td>5.03</td>
</tr>
<tr>
<td>Unknown</td>
<td>0.90</td>
<td>1.38</td>
<td>1.22</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>56.00</td>
<td>54.00</td>
<td>54.00</td>
</tr>
<tr>
<td>Male</td>
<td>44.00</td>
<td>46.00</td>
<td>46.00</td>
</tr>
</tbody>
</table>


Although the institution experienced declines in total enrollment, most notably due to a university system change that added an additional bachelor serving institution with 60 miles of this institution, the campus’ diversity has continued to increase. The growth of Latinos is natural
given the demographics of the state in which the institution resides, a state with significant
growth in this population. Table D.4 below provides precollege cognitive factors for the first-
time in college cohorts the three respective years. For each year, first-time in college enrollment
increased. Additionally, the institution witnessed a steady increase in student quality, but
struggled to keep these students on their campus to the next fall based on the 2.3% reduction
in retention between the 2009 and 2011 cohorts.

Table D.4

Demographic Breakdown of First-time in College Enrollment

<table>
<thead>
<tr>
<th>Variable</th>
<th>2009 %</th>
<th>2010 %</th>
<th>2011 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Time in College Enrollment n for Cohort</td>
<td>3,175</td>
<td>3,367</td>
<td>3,607</td>
</tr>
<tr>
<td>Average SAT Score</td>
<td>1095</td>
<td>1101</td>
<td>1106</td>
</tr>
<tr>
<td>High School Quartile Rank</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Quarter or Top 25%</td>
<td>52.89</td>
<td>54.19</td>
<td>54.96</td>
</tr>
<tr>
<td>2nd Quarter</td>
<td>37.11</td>
<td>36.02</td>
<td>36.28</td>
</tr>
<tr>
<td>3rd Quarter</td>
<td>8.95</td>
<td>8.46</td>
<td>8.03</td>
</tr>
<tr>
<td>4th Quarter or Bottom 25%</td>
<td>1.04</td>
<td>1.33</td>
<td>0.74</td>
</tr>
<tr>
<td>Cohort’s First Year Retention Rate</td>
<td>78.10</td>
<td>78.50</td>
<td>75.80</td>
</tr>
</tbody>
</table>


Data retrieved from the IR department yielded 9,584 complete records for analysis.

Women represented 56% of the data (n = 5,398) and men composed 44% (n = 4,186). In terms
of race and ethnicity, 56% of the population was White (n = 5,417), with the second largest
population being Latino (n = 1,896, or 20% of the entire dataset). The average SAT score was
1091, and 85% if the dataset (n = 8,091) were in the top and second quarters of their high
school class. Latino men, the primary focus of the study, comprised 9% of the dataset at 860.
The first-year retention rate for all students in the sample was 77.5%. The first year retention
rate of Latino men was 75% ($n = 644$), a percent slightly lower than the overall first-year retention rate.

Data Analysis

I used binary logistic regression modeling to examine the psychometric validity and reliability of ACT Engage College for Latino males.

For the first research question seeking to understand if statistically significant relationships existed between a first-year student’s likelihood to persist at a four-year postsecondary institution and the student’s SAT score, high school academic achievement, gender, and race/ethnicity, a binary logistic regression analysis was conducted to examine the influence of multiple independent variables on persistence. Through this logistic regression model, an understanding was found of the total contribution of each independent variable on persistence, as well as the comparative importance of each variable (Vogt, 2007). This statistically model was appropriate given the dichotomous nature of the dependent variable (Aiken & West, 1991) and helped to show the strength of the association between the predictive factors and actual success data by analysis through odds ratio ($OR$). Additionally, it helped determine how much of the variance is accounted for by the predictors and how much by mere chance (Cramer & Howitt, 2004). The ACT Engage College scale scores were standardized to ease interpretation of results.

Dummy coding was applied to the high school academic achievement variable, gender, and ethnicity. Because academic achievement was considered through percentiles, there were five categories, the fifth encompassing students with no high school rank. Applying the $k - 1$ statistical practice, second quarter, third quarter, and fourth quarter students, as well as those
with no rank were dummy coded, with the top quarter of students serving as the baseline group. For the categorical demographic variables, the categories of White for race/ethnicity and female for gender served as baseline or reference groups for comparison.

Similar to the first research question, the second research question sought to understand if there were statistically significant relationships between a first-year student’s likelihood to persist at a four-year postsecondary institution and the addition of psychosocial variables, as measured by the ACT Engage College survey, after controlling for the student’s SAT score, high school academic achievement, gender, and ethnicity, a binary logistic regression analysis was conducted to investigate if various ACT Engage College scales served as predictors of persistence, separate from SAT score, high school percentile, gender, and ethnicity. Z-scores were calculated for each of the ACT Engage College scales for easier comparisons to the mean (Cohen, Cohen, West, & Aiken, 2003). This model looked holistically at all first-year students.

The third research question sought to understand if there were statistically significant relationships between a first-year Latino male student’s likelihood to persist at a four-year postsecondary institution and the student’s motivational and skills, social engagement, and self-regulation scores, which were all measured by the ACT Engage College survey, after controlling for the student’s SAT score and high school academic achievement. Again, a binary logistic regression analysis was conducted to answer this research question. First the model was considered similar to the first research question where only high school percentile, SAT score, and gender were taken into consideration and then the ACT Engage College scales were added to the model to determine if a model change existed. Again, z scores for each ACT Engage College scale was used for analysis. The third research question was meant to find out if Latino
men have different predictors of their persistence than the first-year students in general.

The data analysis methods employed for this study presented a comprehensive look at
the impact of both cognitive and psychosocial factors on persistence. Different from most
predictive models, the inclusion of psychosocial factors in the analysis allowed a more
comprehensive look of persistence for first-year students and differences across gender and
ethnicity. Additionally, by considering actual retention data, versus a predicted probability of
retention, the psychometric validity and reliability of an assessment designed to predict
retention could be explored. By parceling out Latino males in the last research question,
research on retention was enhanced by creating a greater understanding of the differences, or
the lack of difference, between Latino male college students and the overall college student
population.
APPENDIX E

ADDITIONAL DISCUSSION
Discussion

The college student retention literature has shown that what happens in college matters more than what happens prior to college in terms of student retention and academic achievement (Kahn & Nauta, 2001; St. John et al., 2001). However, the ACT Engage College represents a valuable assessment that provides a starting place for building a predictive model that can lead to early intervention for at-risk students. In today’s college environment, administrators need early predictive factors to identify those who may be at-risk so that targeted interventions can be employed early on in the college experience, before a student begins the departure process, whether mentally or physically.

My findings showed that the inclusion of cognitive and psychosocial factors in the predictive modeling of retention can be beneficial to understanding college students’ persistence. That being said, what psychosocial factors and the weight given to each factor should be considered, along with the student’s racial/ethnic and cultural background. Specifically, the psychosocial scales of Commitment to College ($OR = 1.006, p < .01$), Academic Discipline ($OR = 1.005, p < .01$), Social Activity ($OR = .997, p < .01$), Social Connection ($OR = 1.004, p < .01$), and Academic Self-Confidence ($OR = .997, p < .01$) provided predictive ability for a large sample of students. Two of these scales fell within the Motivation domain, two were in the Student Engagement domain, and one was part of the Self-Regulation domain. The five statistically significant predictors provide important fuel for designing interventions.

The findings showed for Latino males, in particular, other psychosocial measures outside of those simply measured by ACT Engage College may better predict their retention. In recent studies, Well (2008) and Strayhorn (2010) found that social and cultural capital may be more
likely to explain a significant amount of the variance for Latino males.

At the institution from which the data were obtained for this study, over 78% of the student population received some form of financial aid. I recommend studying a combination of psychosocial measures and social and cultural capital variables in order to explain more Latino male retention variance using institutions with a significant portion of the student population demonstrating high financial need. Retention efforts on college campuses are likely to increase, especially given the loss of income institutions endure with every student leaver and the external pressures from accrediting agencies and policymakers. Even though it is unlikely a silver bullet exists to identify at-risk students across populations of students and across institutional types and locations, administrators would benefit from empirically testing instruments and prediction formulas using their own student populations as part of the effort to improve retention even slightly.

I found that only five out of 10 ACT Engage College psychosocial scales explained a significant amount of the variance when considering as a collection of all students from a variety of backgrounds and academic abilities. None of the ACT Engage College psychosocial scales displayed statistical significance for predicting a sample of only Latino males. In situations such as this, institutional researchers may want to weight the statistically significant scales more heavily as part of developing a formula for identifying at-risk students. Future researchers are encouraged to consider more sophisticated data mining techniques as part of creating a better fitting retention model for specific campuses or student populations.

The recommendations are also calls to action for companies selling assessments to higher education institutions seeking to identify their at-risk populations early in the college
experience. In the case of the ACT Engage College, in addition to precollege cognitive factors and scores across the psychosocial measures being used to develop a retention and academic index, demographic factors like gender and ethnicity do need to be included. More research is needed to understand the individual differences that exist across the demographic variables. The demographics of institutions have become far too diverse to consider student populations in a homogenous way any longer. With each new study, retention models can be developed that better explain the variance in persistence.
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