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Quantitatively Assessing Student Transitions and Pathways to a Four-Year Higher Education Institution from High Schools and Community Colleges

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ABSTRACT

This case study examined the routes taken to attending college and the performances of 1,136 undergraduate students enrolled at a Southern, rural U.S. institution of higher education and who completed their respective bachelor degrees. The pathways to higher education admission and progression were examined with respect to both traditional high schoolers and community college students who transferred to a four-year university. An outcome of the study showed that the performance of the two groups did not depend on the path they took to attend the university. Thus, it appeared that the pathways experienced by high school admittees and community college transfer students toward collegiate enrollment did not affect their performance after admission.

Keywords: college choice; enrollment; higher education; student performance; transfer student; vocational education

1. Introduction

The pursuit of higher education remains a central goal for individuals seeking upward mobility, personal growth, and professional advancement. However, within the context of the college choice process, the pathways students individually take to enroll in college vary considerably depending upon whether they are considered traditional or non-traditional students. Traditional students, typically recent high school graduates, often adhere to a direct pipeline into college whereas non-traditional students may enter higher education later in life, perhaps after community college or pursing occupational employment, while simultaneously balancing work, family, and other responsibilities and obligations (Choy, 2002). Across both groups, standardized measures, such as American College Test (ACT) scores and collegiate grade point average (GPA) have important roles toward various opportunities, admissions decisions, and levels of academic persistence. Understanding characteristics of these pathways provides insight regarding various aspects of access and success in higher education.

Pursuing higher education is shaped by diverse student pathways, with two of the most common being direct enrollment from high school and transfer from community college. These routes differ in their timelines, the academic indicators used to evaluate readiness, and the institutional structures that support student progress. Standardized testing, particularly ACT scores, and measures of academic achievement such as high school GPA (HSGPA) and collegiate GPA, remain central to admissions and persistence. Recent research highlights evolving roles for these measures, especially as test-optional policies and community college transfer initiatives reshape the higher education landscape (National Student Clearinghouse Research Center, 2024; Sanchez, 2024a). This essay outlines the distinct pathways for high school and community college students and considers how ACT scores and collegiate GPA affect access and success.

1.1 Pathways from High School

Students entering directly from high school typically rely upon HSGPA and standardized test scores such as the ACT. Both measures are predictive of first-year college GPA (FYGPA), with stronger models emerging when the two are combined (Sanchez, 2024a). Sanchez (2024b) indicated that FYGPA mediates the relationship between pre-college metrics and longer-term academic outcomes, reinforcing the importance of early momentum (Sanchez, 2024b). However, recent trends complicate reliance on HSGPA alone. Between 2018 and 2022, grade inflation reduced the strength of HSGPA as a predictor of college outcomes, while ACT scores remained comparatively stable (Sanchez, 2024c). As a result, institutions adopting test-optional policies face challenges in balancing equity with predictive accuracy. Some selective universities, such as Harvard and Yale, have reinstated test requirements, citing internal evidence that standardized scores improve admissions decisions across socioeconomic lines (Borter, 2024; Leblanc, 2024).

1.2 Pathways from Community College

Community colleges serve as a vital entry point to higher education for many students, particularly those seeking affordable tuition, flexible scheduling, or academic preparation before transfer. In this pathway, ACT scores and HSGPA are less relevant; instead, collegiate GPA earned in community college becomes the central determinant of transfer eligibility (Velasco et al., 2024). Transfer admissions decisions, scholarship consideration, and major readiness hinge largely on GPA thresholds, often reinforced by articulation agreements between two- and four-year institutions. Many community college students lose credits in transfer or face unclear requirements, which delays bachelor's degree completion (Miller, 2025). As such, transfer credits contributing toward GAP are therefore not only a measure of academic ability, but also a gatekeeping factor for maintaining progress toward timely graduation. Students who transfer with higher GPAs may perform as well as or better than students who began at four-year institutions, once given access to equivalent coursework (Velasco et al., 2024). This underscores the importance of policies that streamline transfer and protect credits while holding clear GPA standards.

2. Relevant Literature

Student performance may be considered from the perspective of scores earned on the American College Test (ACT). The ACT is a standardized collegiate entry test that has been used widely in American society as a means of distinguishing "between the widely varying levels of rigor among high schools" (Buckley, Letukas, & Wildavsky, 2018, p. 290). Standardized test scores, such as the ACT, have long been heralded as predictors of student successfulness among collegiate environments academically (Sparkman, Maulding, & Roberts, 2012). For instance, among business students, ACT English and math scores were deemed valid predictors of successfulness among management and statistics courses (Welborn, Lester, & Parnell, 2015). Within a Mississippi community college, ACT scores were linked to student successfulness, but not unsuccessfulness (Harris & King, 2015). Harris and King (2015) showed that for each one-point increase of the ACT composite score, students were approximately 18% more likely to exhibit success within a computer applications class. Similarly, the chance of student success within a computer applications class was approximately 11.9% greater for every solitary point increase of the ACT score representing science reasoning (Harris & King, 2015). Although ACT scores may be predictors of success, they were not related to predicting accurately college graduation (Sparkman, Maulding, & Roberts, 2012).

Grade-point average (GPA) is an indicator of student performance. A study performed at a comprehensive IIA higher education institution showed that gender minimally affected GPA, and that females performed academically somewhat better than males (Doss & Kamery, 2005). The study also showed that class standing and collegiate major did not impact GPA significantly (Doss & Kamery, 2005). The study also showed that ACT score predicted significantly GPA, and that a relationship existed between ACT score and GPA (Doss & Kamery, 2005). Additionally, among transfer students that entered university settings from community colleges, Townsend, McNerny, and Arnold (1993) showed that community college GPA was a predictor of university GPA. Townsend, McNerny, and Arnold (1993) also showed that transfer students who exhibited at least a 2.5 GPA during community college were capable of maintaining a 2.3 GPA among university settings (Townsend, McNerny, & Arnold, 1993). Transfer students that exhibited a GPA of less than 2.5 average exhibited a university GPA of approximately 1.9 (Townsend, McNerny, & Arnold, 1993).

Transitioning from high school to a university setting has often been tumultuous and stressful for incoming students (Chemers, Hu, & Garcia, 2001). During the first year of collegiate education, self-efficacy of students was a factor that contributed indirectly and directly toward student success and academic performance (Chemers, Hu, & Garcia, 2001). Similarly, during the first collegiate year, self-efficacy also influenced personal adjustments among students regarding acclimation to collegiate settings (Chemers, Hu, & Garcia, 2001). Self-efficacy also exhibited a strong relationship with student responses to the rigors of collegiate experiences (Chemers, Hu, & Garcia, 2001). Medical conditions also affected the transition to collegiate settings (Almadani, et al., 2014). For instance, students diagnosed with irritable bowel syndrome did not adjust to collegiate environments as well as their healthy counterparts thereby impacting academic performance (Almadani, et al., 2014).

Student performance may be considered from the perspective of active learning paradigms. Active learning engages students directly within the learning process. Common examples of active learning included interaction among small groups, class games, simulations, case study exercises, and assignments that involved solving problems (Becker, Watts, & Becker, 2006). Active learning contributed toward improvements of student performance in the fields of mathematics, science, and engineering (Freeman, et al., 2014). Among collegiate settings, the use of active learning contributed toward improved remembrance of materials contained within introductory and upper-level classes (Cherney, 2008).

Student performance may be viewed from the perspective of accountability. High levels of accountability existed among states that exhibited large populations and high quantities of students whom were minorities (Carnoy & Loeb, 2002, p. 320). Among states that implemented high accountability, neither significantly lowered rates of completion nor significantly higher rates of retention existed (Carnoy & Loeb, 2002). Within the U.S., among states, the use of systems of accountability contributed toward achievement increases that would not have occurred in the absence of accountability (Hanushek & Raymond, 2004). The use of punitive consequences, such as "takeover threats" institutionally for poor performance or the use of rewards monetarily, were catalysts whereby academic institutions were motivated toward enhancing student performance (Hanushek & Raymond, 2004, p. 2).

Modality of learning venue also is a consideration of student performance among collegiate settings. Regarding online, blended, and face-to-face course delivery modalities, Larson and Sung (2009) indicated that no statistically significant difference existed regarding examinations versus final grades when comparing these three modalities. Among these three categories, online and blended delivery modalities exhibited higher levels of learning effectiveness,

faculty satisfaction, and student satisfaction (Larson & Sung, 2009). Friday, Friday-Stroud, Green, and Hill (2006) discovered no differences between online versus physical students among collegiate management courses, but observed differences regarding gender (Friday, Friday-Stroud, Green & Hill, 2006). In this case, females performed better than males among online learning environments (Friday, Friday-Stroud, Green & Hill, 2006).

Faculty instruction and grading are also contexts of student performance. Within a study that examined a microcomputers and business course, it was determined that part-time faculty members assigned final grades that were 0.35 points higher than the grades awarded by full-time faculty members (Doss, Pitts, & Kamery, 2005a). Another study showed that full-time faculty members assigned grades that were 0.46 lower than the final grades assigned by part-time faculty within an Algebra fundamentals course (Doss, Pitts, & Kamery, 2005b). Regarding collegiate studies involving organizational behavior and management, full-time faculty assigned final grades that were 0.22 points higher than the grades that were assigned by part-time faculty (Doss, Pitts, & Kamery, 2005c). Within an English course, a study showed that part-time faculty members awarded grades that were 0.83 higher than the grades which were awarded by full-time faculty members (Doss, Pitts, & Kamery, 2005d). Regarding a Legal Environment of Business Course, Pitts, Doss, and Kamery (2005a) showed that part-time faculty personnel awarded final grades that were 0.40 points higher than grades which were awarded by full-time faculty. Another study that examined final grades within a business law course showed that part-time faculty awarded final grades that were 0.16 higher than the grades awarded by their full-time faculty counterparts (Pitts, Doss, & Kamery, 2005b).

Full-time versus part-time student enrollment status may affect performance. Effective time management was of greater importance for part-time students than it is for full-time students (MacCann, Fogarty, & Roberts, 2012). In contrast to full-time students, part-time students often had distractors that affected collegiate experiences and performances. For instance, part-time students often devoted attention to employment, families, and other life obligations (Martin, Wilson, Liem, & Ginns, 2013). In some cases, the use of mentoring programs potentially improved grades among part-time students (Bettinger, Boatman, & Long, 2013).

Learning style and teaching style also may affect student performance through time. An understanding of learning style was necessary for ensuring that learning was meaningful and effective (Anjali, 2014). Authoritarian teaching has been shown to improve student performance among Vietnamese, Hispanic, and Caucasian students (Dever & Karabenick, 2011). When an array of learning styles was accommodated within teaching processes, the effectiveness of teaching improved (Felder, Felder, & Dietz, 2002). The aligning of learning and teaching styles facilitated improved remembrance and understanding of materials (Brown, 1978; Felder, 1993). Also, differences existed among learning styles across a variety of academic disciplines, and the preference of learning style also varied with respect to performance (Jones, Reichard, & Mokhtari, 2010).

A variety of other attributes affect student performance within higher education settings. Common examples have included attendance; class settings that were catalysts for critical thinking and interaction among students; use of supplements to enhance textbook materials; incorporation of realistic examples during discussions; scheduling of courses during mid-day hours between 10:00 a.m. and 3:00 p.m.; use of class projects; student employment, working hours, and quantity of hours worked; and financial stressors among students (Devadoss & Foltz, 1996). Learning experiences must be understandable, relevant, realistic, and meaningful for the student (McElreath, et al., 2018). Obesity may also affect student performance detrimentally (Taras & Potts-Datema, 2005). Physical exercise, occurring over lengthy periods for producing fitness improvements, improved the chances of enhancing cognitive capabilities (Taras, 2005). Among business courses, capturing lectures, via audio or video recordings, contributed to an approximate 3% improvement among final examination scores (Terry, Macy, Clark, & Sanders, 2012). Regarding students who are employed, grades were unharmed by marginal working hours (Darolia, 2014). Feedback from instructors contributed toward improving student performance (Eom, Wen, & Ashill, 2006). Such examples show the complexities of student performance among collegiate settings.

Although a review of the literature revealed a variety of factors that affected student performance, absent from the reviewed literature were discussions that addressed whether pathways to college or university settings affected student performance at a regional university. Given this literary shortcoming, this study addressed not only student performance, but also the perspective of pathways to higher education regarding direct entrance to collegiate and university settings after graduating high school versus transferring to a four-year institution after attending a community college.

3. Research Questions and Hypotheses

Given the discovered absence of literature discussing whether the routes to higher education impacted student performance during the collegiate years, the primary research question of this study was: Was there a difference between the collegiate performances of students who entered college directly from high school versus the collegiate performances of students who entered college by transferring from a community college? This primary research question was addressed by posing supplemental research questions, as follows:

> Q_1: Was there a difference between the American College Test (ACT) composite scores of high school entrants versus the ACT composite scores of community college entrants?
>
> Q_2: Upon completing the bachelor's degree and graduating from the host institution, was there a difference between the grade point averages (GPAs) earned by direct high school entrants versus the GPAs earned by community college entrants?
>
> Q_3: Was there a relationship between composite ACT score upon entering the host institution and GPA upon graduation at the host institution?
>
> Q_4: Was there a relationship between composite ACT score upon entering the host institution and distance traveled from home versus GPA upon graduation at the host institution?
>
> Q_5: Did the academic performance of a student depend on the path (either direct entry after high school or after attending community college) they took to attending the host institution?

Various hypotheses were crafted to reflect these research questions. The null hypotheses are stated as follows:

> H_1: There was no statistically significant difference between the ACT composite scores of high school entrants versus the ACT composite scores of community college entrants.
>
> H_2: There was no statistically significant difference between the GPAs earned by direct high school entrants versus the GPAs earned by community college entrants upon completion of the bachelor degree program.
>
> H_3: No statistically significant relationship existed between composite ACT score upon entering the host institution and GPA upon graduation at the host institution.
>
> H_4: No statistically significant relationship existed between ACT score and distance from home versus GPA upon graduation.
>
> H_5: No statistically significant relationship existed between the routes taken to enter the host institution (either direct entry after high school or entry after attending a community college) and distance from home versus GPA upon graduation.

4. Methodology

The study was performed at a regional teaching university located within the southern United States. All data sets were anonymized by removing all personally identifying attributes from the data. Thus, the data sets reflected only records for ACT, GPA, and distance from an origin point to the higher education institution. Data sets for this research study represented two perspectives: students entering the institution directly from high school and students entering the institution by transferring from a community college. A total of 1,136 student records was examined within this study. The examined academic records were limited to those individuals who entered the host institution and completed an undergraduate degree.

Statistical analysis was performed to examine students that directly attended the host institution from high school versus students who attended the host institution after transferring from another institution. The analytical methods consisted of analysis of variance (ANOVA), regression, and the Chi-Square test. Significance levels were 0.05 for

each statistical test. In order to judge effect magnitude, the Cohen's f^2 method was used to examine effect size for statistically significant outcomes.

The ANOVA method was used to examine whether a statistically significant difference existed between the ACT scores of students who directly attended the host institution after completing high school versus students who entered the host institution after transferring from a community college. The ANOVA method was used to examine whether a statistically significant difference existed between the GPA values of students who entered the host institution directly from high school versus the GPA values of students who entered the host institution after transferring from a community college.

Regression was used for exploring the relationship between composite ACT score upon entering the host institution and GPA upon graduation at the host institution. Regression was also used to examine the relationship between ACT score and distance from home versus GPA upon graduation. The Chi-Square test was used to examine distributions between students directly entering the institution from high school versus students indirectly entering the institution via a community college.

5. Findings

Analysis of variance (ANOVA), regression, and the Chi-Square test for independence were performed as hypothesis testing regimens. All hypothesis tests incorporated a 0.05 level of significance ($\alpha = 0.05$). The statistical tests were performed to examine the traditional and non-traditional students that attended the host institution and who successfully completed their degrees with a GPA of 2.0 or higher.

5.1 Demographics

The demographics of the examined students showed that the composite ACT score was approximately 19.36 and that the average GPA upon graduation was approximately 2.992. The host institution employed a four-point GPA scale (e.g., A=4.0, B=3.0, C=2.0, D=1.0, F=0.0). Therefore, the average student GPA upon graduation represented an upper-bound, average performance. The demographics showed that approximately 57.81% of the students were classified as in-state students whereas approximately 42.19% were classified as out-of-state students. Among the examined student records, approximately 82.16% received Bachelor of Science degrees, approximately 16.92% received Bachelor of Business Administration degrees, approximately 0.84% received Bachelor of Arts degrees, and approximately 0.08% received Bachelor of Music Education degrees.

5.2 Findings of the First Hypothesis

The first hypothesis investigated whether ACT score differences existed between the groups. Table 1 shows data demographics for the examined ACT scores.

Table 1
ACT Scores

Category	High School	Community College
Mean	19.39	19.54
Median	19.00	20.00
Mode	18.00	20.00
Variance	11.92	12.40
St. Dev.	3.45	3.52

The ANOVA testing regimen was performed between the ACT scores of students who directly attended the host institution after completing high school versus students who transferred from a community college. Hypothesis testing showed no statistical significance [$F(1,831) = 0.37$, $p = 0.54$, $\alpha = 0.05$] between the high school and community college groups. Failure to reject the null hypothesis suggested that no statistically significant difference existed between the ACT composite scores of high school entrants versus the ACT composite scores of community college entrants.

5.3 Findings of the Second Hypothesis

The second hypothesis examined GPA differences between the groups. Table 2 shows data demographics for the examined GPA values.

Table 2
GPA Scores

Category	High School	Community College
Mean	2.92	2.96
Median	2.92	2.91
Mode	2.94	3.64
Variance	0.27	0.20
St. Dev.	0.52	0.45

The ANOVA testing regimen was performed between the GPA scores of students who directly attended the host institution after completing high school versus students who transferred from a community college. The GPA represented the academic performance earned upon graduation from the host institution. Hypothesis testing showed no statistical significance [$F(1,831) = 0.96$, $p = 0.32$, a = 0.05] between the high school and community college groups. Failure to reject the null hypothesis suggested that no statistically significant difference existed between the GPA composite scores of high school entrants versus the GPA composite scores of community college entrants upon graduation from the institution.

5.4 Findings of the Third Hypothesis

The third hypothesis examined the strength of relationship between ACT score and GPA upon graduation. Table 3 shows data demographics for the examined variables.

Table 3
ACT Scores and GPA Scores

Category	ACT Score	GPA Score
Mean	19.49	2.93
Median	19.00	2.92
Mode	20.00	2.93
Variance	11.90	0.24
St. Dev.	3.45	0.49

Straightforward regression analysis showed a weak relationship between the examined variables. Specifically, the regression outcome showed a multiple R value of 0.4156, and that the R^2 predictor explained 17.27% of the variance. The model significantly predicted GPA upon graduation, $F(1, 712) = 148.67$, $p = .001$, $f^2 = 0.20$.

5.5 Findings of the Fourth Hypothesis

The fourth hypothesis investigated the independent variables of ACT score and distance from home versus the dependent variable of GPA upon graduation. Table 4 shows data demographics for the examined variables.

Table 4
Distance from Home, ACT Scores, and GPA Scores

Category	Distance from Home	ACT Score	GPA Score
Mean	70.69	19.49	2.93
Median	52.29	19.00	2.92
Mode	21.44	20.00	2.93
Variance	9878.85	11.90	0.24
St. Dev.	99.39	3.45	0.49

Regression was performed to determine whether composite ACT score upon entering the host institution and distance from home significantly predicted GPA upon graduation at the host institution. The regression testing outcome showed that the predictors explained 17.48% of the variance and that the model significantly predicted GPA upon graduation, $F(2, 711) = 75.32$, $p = .001$. The regression analysis showed that ACT composite score contributed significantly to the model ($B = 0.06$; $p = 0.000$; $f^2 = 0.21$), but distance from home did not provide a significant contribution ($B = -0.00023$; $p = 0.17$).

5.6 Findings of the Fifth Hypothesis

Detailed analyses were performed by different GPAs between the groups. The Chi-Square test of independence was performed to determine the dependency of performance by the two groups involving students directly entering the institution from high school versus students indirectly entering the institution via a community college (i.e., transfer students). To perform the analysis, the students were categorized based on their collegiate GPA performance. Below, Table 5 shows these GPA categories and their respective data values.

Table 5
Observed Values for Pearson-Chi-Square Test of Independence

	Observed Values in Different Categories of GPA Ranges				
Item	2.0 - 2.5	2.5 - 3.0	3.0 - 3.5	3.5 - 4.0	Total
High School	106	213	170	80	569
Community College	72	224	194	77	567
Total	178	437	364	157	1,136

The Chi-Squared result was significant ($X^2(3, N = 1{,}136) = 8.41$, $p = 0.04$). The analysis was performed again by deleting the GPA category between 2.0 and 2.5. The resulting outcome showed an insignificant result ($X^2(2, N = 1{,}136) = 2.04$, $p = 0.36$), meaning that the performance of a student did not depend on the path they took to attending the host institution.

6. Conclusions, Implications, and Recommendations

No statistically significant difference existed between the ACT composite scores of high school entrants versus the ACT composite scores of community college entrants. Upon completing the bachelor degree and graduating from the host institution, no statistically significant difference existed between the GPAs earned by direct high school entrants versus the GPAs earned by community college entrants. Therefore, during the upperclassman years of study, the educational processes and academic experiences employed by the host institution appeared to have affected both groups similarly regardless of their selected method of entering the host institution. This study also showed that no statistically significant difference existed between the admissions test composite scores of high school entrants versus the admissions test composite scores of community college entrants. An outcome of the statistical analysis showed that the performance of a student did not depend on the path they took to attending the host institution (i.e., direct enrollment after high school or transferring from a community college).

This study showed that GPA and the path of the students were significantly dependent. More students fell below a 2.5 GPA who directly came from high school as compared to community college entrants. In other words, students who entered the host institution after attending community college earned somewhat better GPAs as compared to students who entered the host institution directly from high school. Given this outcome, the host institution may desire to increase its recruiting and enrollment efforts among community colleges.

Institutional survival depends on the successes of students in completing their degrees (Howard & Sharpe, 2019; Noel, 1978). Thus, higher education institutions have a vested interest toward ensuring that all students, whether transfers or those who entered directly after high school, successfully complete their respective studies and earn degrees. This study showed that the pathway taken to attend the host institution and the resulting GPA upon the completion of the bachelor degree were not dependent. In other words, the performance of a student to complete a degree did not depend on the path they took to attend the host institution.

Although this study considered pathways to higher education, it lacked consideration of efforts made by students toward completing their studies after enrollment. Time expended for studying is a consideration of student performance. During the year 1961, undergraduate students expended approximately 40 hours weekly studying whereas they expended approximately 27 hours studying weekly by the year 2003 (Babcock & Marks, 2011). Future studies may examine whether any differences exist in study time regarding performance and GPA with respect to whether students entered the institution from either high school directly or via a community college.

Amalgamating data regarding the pathway students take to enter a higher education institution provides an opportunity to examine whether institutional policies and enrollment activities are fruitful through time, including strategic periods (i.e., five or more years). As such, given that accreditation occurs over ten-year periods, opportunity exists to examine educational pathways from the perspective of period studies. The examining of segmented periods, or periodization, was deemed a useful method for generating historical contexts of events (Topolski, 1973). Regarding such

perspectives, McEleath, et. al, (2021) indicated that the passing of much time, usually a couple of decades, ranging across strategic periods, was necessary for understanding historical contexts of events. Thus, opportunities exist for future research consider educational pathways from the perspectives of institutional accreditation from both periodization and longitudinal approaches.

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