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College Commute Distance and Retention for First-time, Community College Freshmen

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College Commute Distance and Retention for First-time, Community College Freshmen

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by

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ABSTRACT

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The purpose of this non-experimental, quantitative correlational study was to investigate whether any significant relationships existed between one-way student commute distance and retention for first-time, community college freshmen. Additional student success metrics such as three-year graduation rates, enrollment status, credit hours attempted and completed, and GPA were also analyzed for any possible relationship with commute distance.

Archival student data were collected from the participating institution, a public community college in the southeastern United States with four separate instructional site locations. This study followed the incoming class of 2016, entering in the fall semester, through the end of their third year, completing in Spring 2019. The sample included all first-time freshmen at the institution who were taking all their classes in-person (N = 1,320). Students' residential ZIP codes and location of classroom instruction were collected to calculate the one-way commute distance in miles.

Chi-square test of independence, one-way analysis of variance (ANOVA), and a Pearson correlation coefficient were utilized to analyze the research questions for significant relationships among the study's variables. Results indicated that commute distance for first-time community college freshmen does not have a significant relationship with freshman to sophomore retention, overall GPA, or three-year graduation outcome. This study identified a significant, positive

relationship between commute distance and credits attempted and credits completed during the first semester of enrollment. Student ethnicity was also found to have a significant relationship with commute distance. Minority students were found to be less likely to commute longer distance compared to their peers. Students attending classes at the institution's main campus instructional site were found to be significantly more likely to graduate in three years compared to those attending classes at satellite locations, regardless of commute distance.

DEDICATION

This dissertation is dedicated to my family, who have shown endless love and support to me throughout my life. To my parents, Michael and Maria O'Hagan, for building a loving home environment and always putting family first. To my paternal grandfather, Harry Hagan, whose love and quest for knowledge and truth is infectious and has continuously pushed me forward to continue learning. To my sister, Carmen O'Hagan, who has been by my side as the greatest friend and confidant a brother could ever have. And last, but certainly not least, to my loving and wonderful wife, Lindsey O'Hagan. I am truly blessed beyond words to be your husband. Your intellect, beauty, and kindness inspire me to be the best I can be. I would also like to dedicate this dissertation to any future children we may have. I hope that the commitment and dedication invested in this endeavor will prove to you early in life that you can achieve anything you set your mind to.

Additionally, I dedicate this dissertation to the memory and honor of influential loved ones who have passed before me. To my maternal grandfather, Jose Herrán, who earned his doctorate from the University of Havana before fleeing communism in Cuba to start a new life for his children in America. To my paternal great grandmother, Pauline Moore, who helped raise my father and send him to law school, and later formed a loving bond with me when I was a young boy. And lastly, to my father-in-law, Eduardo Isla, who raised my amazing wife, Lindsey, and accepted me into his heart as his own son. I know each of you would be very proud of this accomplishment. Your memory lives on in my heart.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1. Introduction

Across all types of post-secondary institutions in the United States, whether public or private, two-year or four-year, the majority of students live off-campus (Jacoby, 2000). In fact, it is reported that more than 85% of college students live in housing that is not owned by or located on their college campus (Horn & Nevill, 2006). By definition, these individuals are labeled as commuter students, as they live in non-institutionally owned housing and must commute to and from their college campus each day to attend classes (He, 2019). For the overwhelming majority of public, two-year community colleges, which by historical design do not typically offer on-campus housing, nearly all of their students are considered commuters and must therefore find a way to transport themselves to and from their respective college campuses. With that necessity to regularly travel to class comes many potential variables and barriers that could hinder student retention and success, specifically at the community college level. There is a significant imbalance in the amount of research dedicated to commuter students when compared to their overwhelming majority status within the population of college students across the country (Dugan et al., 2008). This lack of knowledge and understanding could be hindering this population from future success by not fully identifying and studying the unique challenges that this group faces. More specifically, the differences found and observed within the community college student population, compared to their four-year, university peers, could benefit from further focus on the relationship between commute distance and retention (Mertes & Hoover, 2014). Community colleges are unique institutions of higher education with their own characteristic history and mission, and their students face a disproportionate ratio of necessary commuting to attend class. Therefore, it should be a high priority for the academic community to study this topic in greater depth.

Meanwhile, national focus in the higher education field has been fixated on the alarming statistics and trends associated with college retention and completion. The National Student Clearinghouse Research Center has reported modest improvements in the overall six-year college completion rate nationally for full-time students, yet those retention and completion rates have worsened for part-time students; additionally, the three-year completion rate for community college students has been steadily declining for years (Lang et al., 2021). Coupling declining retention and completion rates with the overwhelming representation of commuter students enrolled in community colleges poses some significant problems for higher education professionals. For example, as these declining trends continue, so does public trust in institutions of higher education, which will ultimately lead to decreased enrollments and graduates, thus harming the economy and resulting in a further chasm of perceived differences in quality between two- and four-year colleges (Garza & Fullerton, 2018). With such statistics and inequities, the topic of college retention is becoming increasingly critical. While there is little research explicitly investigating commute distance and retention, there have been attempts to isolate living arrangement as a research variable associated with college retention. For example, Seow-Eng et al. (2013) identified a possible relationship between on-campus housing and student retention, identifying higher retention rates at institutions with greater on-campus housing availabilities. From this, it could be inferred that commuter students, who do not live in on-campus housing, might be at a disadvantage when it comes to retention. Naturally, this finding also automatically eliminates community college students from the discussion, as only 28% of community colleges offer on-campus housing and only 1% of community college students live in on-campus housing (American Association of Community Colleges, 2015). With that covering such a small percentage of the overall college student population, additional

research is needed to better understand the relationship between commuter students and retention, once more specifically for those enrolled at the community college level.

From the college commuter student perspective, time and money are two important factors and obvious potential barriers that individuals have to deal with in order to attend and complete a postsecondary education. When it comes to the topic of commuting to classes, both of these factors are central to the equation. With juggling work, home, and school, college students can often find time and money to be precious and finite commodities. This is especially true for community college students, who are documented to have a higher likelihood of having to balance these additional responsibilities in addition to their college coursework (Kuh et al., 2001). Depending on where a student lives and what academic institutions are nearby, the time and money costs of commuting can have a significant impact on college attendance and, subsequently, their success. In the rural Southeast, where distance to higher education locations can be substantial, this can seem like a insurmountable problem.

Finally, when it comes to the actual distance that college students must travel to their institutions, there is relatively limited data. Hyde (1980) is one of the few who explicitly highlighted specific mileage distances for student commutes, calculating a one-way average commute distance of 10.2 miles. He also found that community college students have a significantly higher burden of cost related to transportation when compared to their four-year peers. More recently, Nelson et al. (2016) found a negative correlation between commute distance and GPA. Others (e.g. Hillman, 2019; Turley, 2009) have analyzed mileage distances in relation to enrollment trends, but these studies are not focused on the commute itself and do not consider the possibility that students may move far from their home address after enrolling at far-away, four-year universities. Clearly, much remains unstudied and unknown when it comes to

community college commuter distance ranges, trends, and patterns, as well as relationships that may exist with related retention and success metrics for those same commuter students.

Statement of the Problem

Nearly all community college students in America are considered commuter students because they live somewhere other than college housing (American Association of Community Colleges, 2015). Due to this living arrangement, these students are therefore responsible for finding a way to get to and from their home and college campus, which in many cases can be a journey spanning many miles. Whether this is done on foot, bicycle, public transit system, or automobile, commuter students have unique burdens that are not part of residential college students' daily lives. Commuting barriers for college students can range from the preliminary costs and hurdles of obtaining and maintaining transportation to the academic ramifications of juggling classroom responsibilities with the time requirements of commuting and all its associated activities. It has already been documented that some negative correlations have been found between increased commute distances and overall GPA (Nelson et al., 2016).

Higher education accessibility is a key topic throughout America, especially in its more rural areas. Specifically, for this study's focus of first-time, community college freshmen in the Southeast, the distance of nearby campuses can be a significant factor determining college attendance and ultimately retention and completion. The seemingly inconsequential detail of where a child is born and raised has significant impacts on that child's future ability and likelihood to successfully pursue a postsecondary education (Ardoin, 2017). The topics of rurality and access have long been an issue for higher education professionals and will only continue to be as the United States begins to face declining populations of young adults exiting high school.

Therefore, the purpose of this non-experimental, quantitative correlational study was to investigate whether the distance that community college students must travel to their college classes has a significant relationship to retention rates. Potential relationships between distance traveled with full- and part-time student status, three-year graduation rates, credit hours completed, and GPA were also analyzed. Findings from this study could shed light on the topic of college retention rates in rural areas that may not have nearby higher education institutions. Additional outcomes could influence student retention opportunities, barriers, and initiatives for institutions as they seek to improve student success and college accessibility.

Research Questions

The research questions found below were developed and designed for this study's focus on the relationship between the distance in miles that students must travel to attend college classes and their year-to-year retention rate. Additional items such as GPA, graduation rate, full- and part-time status, credit hours completed, along with age, gender, and ethnicity are also included. Each question is proposed as follows:

Research Question 1

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and freshman to sophomore retention?

Research Question 2

Is there a significant difference in overall GPA among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles?

Research Question 3

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and their enrollment status (full- or part-time)?

Research Question 4

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and three-year graduation rate?

Research Question 5

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and credits attempted in first semester (0-6 hours, 7-12 hours, 13-18 hours, or 19+ hours)?

Research Question 6

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and credits completed in first semester (0-6 hours, 7-12 hours, 13-18 hours, or 19+ hours)?

Research Question 7

Is there a significant difference in overall credits attempted among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles?

Research Question 8

Is there a significant difference in overall credits completed among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles?

Research Question 9

Is there a significant relationship between first semester GPA and overall GPA for community college commuter students who attend all of their classes in-person?

Research Question 10

Is there a significant difference in age among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles?

Research Question 11

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and gender (male or female)?

Research Question 12

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and ethnicity (Asian, Black, Hispanic, White, or Other)?

Research Question 13

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and the number of days per week attending class (1, 2, 3, 4, or 5)?

Research Question 14

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and type of degree (AA, AS, or AAS) pursued?

Research Question 15

Is there a significant relationship between instructional site location (main campus or other) and three-year graduation for community college commuter students only taking in-person classes?

Significance of the Study

Despite commuter students being the majority population in U.S. colleges and universities, this student group is largely underrepresented in major research and often underserved and overlooked across all higher education institution types (He, 2019). This study seeks to increase the knowledge and understanding that higher education professionals have related to this large student population's unique barriers of commute distances and any associated impacts that may have on retention and success. Through the process of analyzing data related to student success metrics in conjunction with commute distances, it may be possible to uncover significant relationships that have been previously overlooked. By better understanding any impacts college student commuting distances may have on retention, higher education practitioners and institutions can have a better opportunity to address low retention rates for their students. This study's findings may also allow college students and their parents to have better information on which to base potential enrollment decisions and living arrangements for college attendance.

Compounding the significance of this study is the looming "enrollment cliff" that faces higher education institutions across the country; thanks in part to the long-term impact of the "Great Recession," fertility rates saw a significant decline during that time and will culminate in record low numbers of college-aged students starting in 2026, and holding steady for several years (Grawe, 2018). The obvious impact of this is a significantly reduced pool of potential

students to enroll in higher education institutions. This unavoidable drop in enrollment will make it critical for institutions to better understand and serve what remaining population of college-eligible students are available. From the perspective of this study, that means better understanding any relationships that may exist between commuter students, specifically those enrolled at a two-year community college, and retention rates. It will become increasingly more imperative for college administrators to identify solutions to retain commuter students who are currently enrolled and to better attract and support future commuter students to enroll and complete at their colleges.

The last two decades have seen increased and renewed focus on college student retention and success across a national level. Governmental entities at both state and federal levels continue to increase pressure on higher education institutions to improve these rates in hopes of addressing economic and workforce development needs for the future (Ruecker et al., 2017). To keep these pressures at bay, it may benefit the higher education sector to identify possible variables that may impact college retention through the unique lens of the commuter student. The literature has long pointed to student engagement and integration models as a key to student persistence and retention success (Astin, 1993; Kuh et al., 2001; Tinto, 1975). The next step should then be to isolate the potentially critical variable of commute distance and see what impact, if any, that may have on the retention problem. By fully investigating the under researched topic of commute distance for college students, specifically first-time community college students, it may be possible to uncover significant knowledge and resources to turn the tide on the national trend of low college retention rates.

This study has the additional significance of addressing the important topic of rural access to higher education. Students who reside in rural areas are at a higher risk of not attending

post-secondary institutions due to a lack of options in proximity to their home (Harmon et al., 2022). Couple this with the statistic that the majority of undergraduate college students choose to enroll in institutions within 25 miles of their home, and the problem becomes significantly clearer (Hillman, 2019). Many parts of the service area for the community college in this study are located outside of the abovementioned 25-mile commute range, which forces students who do enroll to find a way to cover that distance on their daily commute. Research on first-generation community college students' enrollment trends shows that such students tend to choose institutions close to home, which further highlights the significance that college proximity plays in the college access discussion (Inman & Mayes, 1999). The findings of this study may justify increased outreach and development of higher education access points across rural areas.

Definitions of Terms

For the purpose of this study, the following terms have been defined:

Commute distance: The one-way driving distance, in miles, from a student's primary home address ZIP code to the location of the college classes being attended.

Commuter student: Student who does not live in on-campus housing and must travel to attend their classes (He, 2019).

Completion rate: The rate at which community college students successfully complete a program within three years; calculated as a percentage (Tennessee Board of Regents, 2023)

Distance education: A delivery of teaching in which the student and instructor are physically separated; common methods of instruction are delivered through the internet and various audio/visual technologies (Roffe, 2004).

Education desert: An area without any postsecondary institutions in the immediate vicinity (Hillman & Weichman, 2016); commonly categorized as counties with no higher education institution (Rinn, 2022).

First-time freshman: A student with no prior post-secondary education experience (U.S. Department of Education, 2023). For the purposes of this study, dual enrollment students and students who have earned Advanced Placement credit are excluded.

Full-time student: An undergraduate student who is enrolled in 12 or more credit hours in a semester (U.S. Department of Education, 2023).

Online education: A form of distance education delivered through the use of computers and the internet; a minimum of 80% of the course must be delivered online to meet the definition (Allen & Seaman, 2008).

Part-time student: An undergraduate student who is enrolled in fewer than 12 credit hours in a semester (U.S. Department of Education, 2023).

Persistence: The quality that an individual employs to overcome obstacles in order to achieve a goal; another way to define motivation (Tinto, 2017).

Self-efficacy: An individual's belief in their self to successfully complete a goal or task (Bandura, 1977).

Student involvement: The amount of energy, both physical and psychological, that students invest into their overall college experience; includes both academic and social aspects of college life (Astin, 1999).

Retention rate: The rate at which first-time, degree-seeking students are enrolled one year after their first semester. This is typically measured from fall semester to the next fall semester (U.S. Department of Education, 2023).

Limitations and Delimitations

This study is limited to the archival student data maintained by the participating institution. Other limitations to this study include self-reported primary student address ZIP codes that are maintained in the student database. It is assumed that the primary residence ZIP code on file for the student is accurate and is the actual area from which the student regularly traveled from to attend class. It is assumed that the data analysis and statistical tests of this study were appropriate to identify any potential significant differences among the test variables.

This study is delimited to first-time, community college freshmen at the participating institution, located in the southeastern United States, who were enrolled in the Fall 2016 semester, and taking on-ground, in-person classes. Students enrolled in virtual or online course formats were excluded from the study, as their distance from home to the college would be insignificant to this study due to their class delivery method. Additionally, this study is delimited to degree-seeking students, as graduation rates are one of the key variables analyzed in conjunction with the students' commute distance. Therefore, results of this study are not necessarily generalizable to other settings.

Overview of the Study

This study is presented in five chapters. Chapter 1 provides an introduction to the topic of college commute distance and student retention, in addition to the statement of the problem, research questions, significance of the study, definition of terms, and limitations and delimitations. The review of literature, as it relates to the topic research questions posed, is presented in Chapter 2. Chapter 3 contains the research methodology used in this study, along with details related to the instrumentation, population and sample, and data selection and

analysis. In Chapter 4, research findings are presented. Finally, Chapter 5 closes with a summary of the study, conclusions, and further recommendations.

Chapter 2. Review of Literature

Associated causes and factors related to college student retention have long been a focal point of higher education research. This is due to the fact that institutions of higher education, from two-year to four-year and beyond to the graduate level, have the ultimate goal of successfully educating and matriculating their students. In order for this successful end result to become a reality, students must first be retained from semester to semester, and subsequently from year to year. When it comes to student retention as a research topic, scholars have developed multiple theories, models, and frameworks to tackle this empirical challenge, yet retention rates across the board have remained largely unchanged throughout modern history (Yu, 2017). While an array of student and institutional attributes have been studied in relation to retention – items such as student background, GPA, work and family commitments, institutional connectivity, social engagement, faculty involvement, and curriculum – little research has been conducted on any possible relationships that may exist specifically among college commute distance and student retention or success rates (Jacoby, 1990).

For this reason, the literature review was conducted in a multi-stage approach focusing on many of the aforementioned variables. It was necessary to first identify the common themes related to the topic that have already been studied, most often as isolated studies focused on a singular subject category. Additional focus was placed on topics with close associations to commuting and retention, such as student transportation barriers and costs, student success, higher education accessibility, and student persistence. From that point, it was then possible to begin to take the literature piecemeal and connect the various findings as appropriate to form a better picture of the relationships of the subjects for this study, primarily community college commuting and its relationship with student retention.

As there is limited research on the specific relationship among college commute distance, student retention, and student success specifically as they relate to community college students, inclusion of four-year college and graduate school studies has been necessary to review, while still keeping in mind the unique characteristics inherent to two-year institutions of higher education (Fong et al., 2018). Additionally, other topics closely related to commute distance through secondary relationships have been explored to better understand the potential barriers, opportunities, and outcomes associated with various distance ranges students might travel to attend college. Commuter students across all institutional types have been largely overlooked in research (Sasso & Paladini, 2021). Therefore, it has become necessary to include any reputable research that could have implications for the study of commuter students.

Due to the specific characteristics of higher education in the United States, literature focused on foreign studies have been excluded from this review. Likewise, literature with virtual or on-line class components were excluded, as the focal point of this work is on physical, in-person education only and the commute distance associated with those classes and students. While some previous research (Hyde, 1980; Nelson et al., 2016) has gathered distance ranges from students and their colleges, there has been little emphasis on commuters specifically. For example, many have analyzed distance ranges to better understand enrollment rates for colleges and universities, but this does not consider where those students are living while attending. The following literature highlights how commuter students, the overwhelming majority student type across all college populations, face a significantly unique experience and set of barriers when it comes to their overall educational experience, and how this relationship can impact retention and completion for commuting students at large, especially first-time freshmen enrolled in a community college (Jacoby, 1990).

Commuting and GPA

Through an extensive meta-analysis of 700 studies performed across two- and four-year schools, Crede and Niehorster (2012) found that the greatest connection to retention could be found with college GPA. For students with strong GPAs, their likelihood of continuing enrollment from semester to semester is significantly higher than that of students with low GPAs. They further evaluated the college adjustment process and its multilevel dimensions through various relationships associated with the student and institution. Crede and Niehorster's study included both two- and four-year students; however, there was no special designation or attention given to commuter students or mention of the distance that they must travel to attend class. Nelson et al. (2016) analyzed GPAs of students enrolled at a four-year university and its related graduate school. Naturally, there are some inherent distinctions between community college and university students and culture, but this does provide a good starting point for this research topic. Nelson et al. (2016) found mixed results – a curvilinear relationship between distance and GPA. A negative relationship was found between shorter commuting distances and GPA, but a positive relationship was found between significantly longer commuting distances and GPA. This suggested that initial distance increases are harmful to student GPA, while significantly further distances, in this study those at the 1% level of the distance range, are actually positive. Nelson et al. concluded that this could be tied to an increased level of dedication and persistence for those students who take on an abnormally large commute distances to receive their higher education. Just as importantly, the large majority of the students faced a negative impact on their GPA with increased commute distances. The average commute distance for the subject population was calculated to be 26.13 miles, with a range of 0-120 miles.

Further research on college distance, degree attainment, and GPA can be found in Garza and Fullerton's 2018 longitudinal study that analyzed the relationship among these variables and showed that first-generation students at four-year universities actually increased their likelihood of success with increased distances from home. While this work included only first-generation college students enrolled in four-year degree programs, it does allow for a stronger analysis of these key topics and provides a greater depth of knowledge to how we might approach and understand college retention as a whole as it relates to distance. One of the key distinctions of their work, however, is that the distance calculated from college to student home address was primarily that of students who moved from that home and resided near or on campus. To be clear, these were not commuter students, but residential, on-campus, students. Hence, these findings further highlight the social integration values of the student experience and how that relationship can tie to increased retention and success. It was noted that this does not dispute the current understanding of decreased retention and success for students who must commute longer distances, and therefore lose out on important on-campus interactions that could boost retention as highlighted by Kuh et al. (2001).

Living arrangements, and their relationship with work, were analyzed by Bozick (2007) in first-generation college students across two- and four-year institutions. Results yielded a link between commuter students who worked and increased dropout rates during the first year of college. Ironically, the cost-saving measures of living at home and working while attending college seem to have negative effects on student success and completion (Boznick, 2007). Additional studies have similar findings that commuting for four-year college students has a negative correlation with the completion of a bachelor's degree (Astin, 1993). Many factors are related to this finding, but research shows that the stress associated with the commute was a key

factor. These four-year students with longer commutes to school often cited increased travel-related stressors in association with declines in degree attainment (Astin, 1993). It is possible to associate these findings between commuter stress and completion to further support the understanding of transportation barriers and costs linked with decreased retention.

In the same line of thought, we also know that students who must commute to their college are also more likely to be the first in their generation to attend college, are older, and have to juggle additional responsibilities associated with home life (Kuh et al., 2001). All of these characteristics further exacerbate the issue of student engagement, persistence, and retention across the board. One anomaly found in the literature involved commuter students who earned higher GPAs than their residential counterparts at a four-year university in the southeastern U.S. (Simpson & Burnett, 2017). The authors conceded that the results could not reasonably be correlated to an academic performance advantage of commuter students over residential students, based on living arrangement alone. It does, however, give further reason to analyze the persistence and success rates of commuter students and any possible characteristics that may be uniquely associated with how they might engage with their college coursework.

Commuting Costs for Students

It is widely accepted that as college students must take time away from their college campus, whether to work or commute, they are at a decreased likelihood of success (Nelson et al., 2016). Not only does commuting, by nature, detract from associated academic pursuits due to its physical time demands, but it also brings about other substantial costs, both fiscal and otherwise, that surround all the transportation-related necessities of college commuting (Jacoby & Garland, 2004). The most recent national data provided by the College Board (Ma & Pender, 2022) shows that the average public community college student had a financial burden of $1,870

just for transportation-related costs alone in the 2022-23 year; this is much higher than the related transportation costs found for students of four-year intuitions, regardless of if they attend a public or private school or live on- or off-campus. To put this into perspective for community college students, whose average tuition and fees for 2022-23 were calculated to be $3,860, the barrier to cover transportation-associated costs is over one-half of their financial obligation of tuition and fees alone. Furthermore, as community college students are more likely to be from lower socio-economic backgrounds, underrepresented or underserved groups, and are often the first-generation in their family to attend college, it is reasonable to expect drops in persistence, retention, and success with such significant commuting costs (Cohen & Brawer, 2003; Jacoby, 1990). Pratt et al. (2019) found that first-generation college students in particular were significantly more concerned with financial needs when attending college and were more likely than their peers to take on employment in addition to their studies. By demanding such a large percentage of student attendance costs for these at-risk populations, it would not come as a surprise to find decreased retention and success metrics (Pratt et al., 2019).

Elengold et al. (2021) identified four major student costs associated with transportation – financial, schedule, time, and stress. Each of the four categories bring with them their own inherent costs and barriers to retention. Their study found that Latino students were 19% more likely than their non-Latino counterparts to cite transportation issues as a barrier to their college success and completion. The issue furthers the growing chasm of college access and affordability for community college students. Castellano and Overman (2009) analyzed this issue through the lens of increasing college going costs, which include transportation, and their impact on community college students in occupational programs. They showed the need for continued

policy efforts and initiatives to address the disparities in college affordability and access, specifically for underserved student populations.

Digging deeper into the literature on the impact of student commutes, historical data presented by Hyde (1980) highlighted that while commuting costs can be significant to all college students, community college students tend to have much higher transportation costs associated with their education due to the fact that on-campus living is not an option. Hyde's 1980 findings indicate that financial barriers related to transportation can have a significantly negative impact on retention and success, especially when it comes to community college students. Furthermore, the study breaks down the barrier of commuting for students into two distinct costs: transportation costs and time costs incurred while actively commuting to and from classes. The former, costs related to transportation, focuses mainly on automobile transportation, which at the time of the study accounted for 89.9% of commuters (Hyde, 1980). Costs associated with this portion include the fuel required to operate students' automobiles, as well as maintenance and upkeep costs of vehicles. Important comparisons were made to other statistical points such as the significantly higher percentage of community college students commuting compared to that of university commuters. Hyde (1980) stated that, "Most of the commuting time is borne by community college students, and the degree of underestimation of this cost is greater for the average community college student than for the average student attending elsewhere" (p. 15). The average one-way distance traveled for a full-time community college student was 10.2 miles (Hyde, 1980). Hyde calculated conservatively that the average community college student of that time spent approximately 61.2 hours commuting per academic year. Hyde additionally found a statistically significant difference between the distance and time spent commuting between part-time students taking one to five hours of college credit, compared

to full-time students. Full-time students traveled significantly farther than part-time students to get to their classes (Hyde, 1980). This may also have a correlation to the increased persistence of full-time students who took on significantly long commutes as shown by Nelson et al. (2016).

Clay and Valentine (2021) further showed the impact of financial barriers due to transportation costs on students' retention and completion. In their quasi-experimental study, the pair looked at the impact of a transportation program provided to community college commuter students in the Los Angeles, California area. The program was an innovative partnership between a public community college and the Los Angeles County Metropolitan Transportation Agency, in which students were provided transportation passes to travel to and from school at significantly discounted rates. This cost reduction removed a significant financial barrier from the students, who were estimated to be spending up to one-fifth of their living expenses on transportation alone (Clay & Valentine, 2021). Students who received the public transportation pass for their commutes showed higher retention rates, both semester to semester and year to year, than their peers. The results were also found to hold true for both part- and full-time students, across gender and academic preparedness. These findings provide another relevant lens to analyze student commute distances and retention, specifically as it relates to mass transportation programs. Similarly to the institution featured in Clay and Valentine's (2021) evaluation, this study's participating community college has also offered mass transit passes to students in the past as part of their regular tuition costs (Shelly, 2022).

Just as commuting has a fiscal cost to students, it also imposes a real time cost that can have equally negative consequences for student retention and completion. If students have too many obligations and time requirements that create a time deficit for physical and mental recovery, then that individual is considered to be time-poor, according to the theory of time

poverty (Vickery, 1977). Using Vickery's theory it becomes clear that students who face long commutes may have less time available for studying and required course activities. This could also lower their GPA and chances of successful completion. The loss of time credited to the commute can also take away from the important social connections that can be made with peers and faculty outside of scheduled class times. These time obligations associated with living at home for commuter students are cited as another key factor and detractor causing declines in student persistence and success across the country (He, 2019). Furthermore, first-time, working community college students have been found to be less likely to reach out to faculty when support is needed, thus removing another key asset – faculty support – that could ultimately benefit a student's overall retention from one year to the next (Longwell-Grice & Longwell-Grice, 2008). The amount of time lost to commuting, along with the associated distractions and obligations associated with off-campus home life, can lead to a decreased amount of time to dedicate to academics and a decreased ability for students to build critical on-campus relationships, ultimately leading to lower GPAs. The greater diversity of obligations carried by non-traditional students such as commuters has a distinct pull on time and energy resources for these students (Metzner & Bean, 1987). Simpon and Burnett (2017) suggested that students living at home may not be particularly disadvantaged when it comes to their academic performance, but instead have to find alternate ways of allocating their time.

Uniqueness of Community Colleges

Most of the reviewed studies related to student commutes or living distance from campus focus solely on those who attend a four-year college or university. The majority of studies also feature traditional student populations, which leaves out older, part-time, and commuter students, which are large subpopulations of community college attendees (Metzner & Bean, 1987). While

much useful knowledge can be gleamed from these studies at the university level, only so much can be applied to the two-year counterparts of four-year students. The differences between the two types of students can be profound at times. Hence, studies that highlight two-year college students' unique characteristics and challenges when it comes to the topics of commuting and retention provide profound takeaways (Mertes & Hoover, 2014). Many of the differences are based on statistical characteristics, such as the fact that the majority of community college students work and attend college part-time (Horn & Nevill, 2006). This is further touched upon in Bozick's (2007) analysis of living and working arrangements for first-generation college students, showing a negative relationship between work and educational success for commuter students.

Another commonly cited statistic deals with the low rate of retention at community colleges – just under one-half of two-year students do not return for their second year – which further erodes the public's trust for the quality of education available at two-year schools (Braxton et al., 2011; Savage et al., 2019). Some of this can be explained through the process at which four-year institutions screen their potential students for admission, eliminating those who may be less likely to succeed from entering, while community colleges are open-admissions institutions (Monaghan & Sommers, 2021). Other differences are rooted in long-held misperceptions, which also cause negative stereotypes of community college students. Garza and Fullerton (2018) called attention to the perceived difference of community college versus four-year students citing potential discrepancies in objectives and characteristics between the institution types. For some individuals working in higher education, the mindset of belittling community colleges as lesser than four-year institutions may not come as surprising. There are in fact many stark differences between two- and four-year institutions that can lead to these slights

of judgement. As Kurlaender et al. (2016) point out, however, it is the characteristic traits and uniqueness of two-year institutions that make them challenging to assess in terms of quality compared to other institution types. Historically speaking, community colleges, originally called junior colleges, have since their inception been "distinctively American intuitions" with the noble goal of providing universal access to post-secondary education (Thelin, 2019, p. 303). The idea of open access to all was a fundamental shift from the longstanding tradition of post-secondary education being primarily for offspring of the wealthy or privileged classes. With that unique historical shift in education, community colleges continue to be the torchbearers of open-access education for all, particularly those from at-risk or underserved populations.

The overwhelming focus on four-year intuitions in the literature on this topic has created a significant gap in knowledge and understanding of the relationship among student commute distance, retention, success, and other key metrics as they pertain uniquely to first-time, community college students (Yu, 2017). As "institutions of opportunity," community colleges are charged with the unique task of accepting students who require developmental course work and additional supportive services that four-year colleges may never have to worry or think about (Schneider, 2022 p. 29). It also should be noted that community college students' ability to develop institutional attachment and belonging happens primarily in the classroom, meaning that a more coordinated effort must be taken by the faculty and staff in order to provide the framework needed to bolster student retention (Schneider, 2022). This is in direct opposition to university students who have a greater opportunity for institutional attachment outside of the classroom.

According to Strauss and Volkwein (2004), it is widely accepted that university students have a greater sense of institutional attachment developed through social interaction

opportunities that are made available outside of the traditional classroom across the institution's campus. Conversely, community college students must rely more heavily on their in-class experiences to build institutional attachment, as the out-of-class social structures are limited on community college campuses that are largely comprised of commuter student populations. It has been found that community college students have larger levels of institutional commitment when all other variables are controlled (Strauss & Volkwein, 2004). This changes the commonly held perception regarding institutional commitment at the two- and four-year levels. Strauss and Volkwein's study involved first-time students from 28 two-year and 23 four-year public colleges and provided more depth and understanding to the complex topic of student commitment and success. As Tinto (1987) has long held, the importance of classroom interactions and relations is a cornerstone for a supportive educational environment, especially for community college students. Strauss and Volkwein (2004) also found that older students had significantly higher levels of institutional commitment, which was an important finding again for community colleges that typically have an increased population of older students. These findings indicate that the in-class experience leads to a greater likelihood of being a predictor for student commitment when compared to social integration. Sasso and Paladini (2021) uncovered that commuter students self-report high levels of student involvement independent of their attachment style or living arrangements, despite their low levels of actual time reported for involvement.

Another characteristic of community colleges, as highlighted by Schneider (2022), is their subpopulation of students who are not enrolled with the intention of completing a program or degree. This is an incredibly unique population to the community college system, based largely on its historical focus on affordable education and occupational studies. Nearly all

community colleges feature continuing education and workforce development departments that serve as access points in communities that regularly attract adult learners who enroll in a course for the sole purpose of increased knowledge or professional/personal development, but not to complete a degree (Schneider, 2022). Universities, on the other hand, traditionally focus on students who enroll with the intent to graduate with a degree.

D'Amico et al. (2014) contended that there are some similarities between community college and four-year students when isolating transfer students. D'Amico et al.'s findings showed that students who transfer from community college to a four-year institution do so with the requisite skills and knowledge to continue their success at the university level. In many respects, this helps to dispel many of the negative perceptions related to community college education quality. While this is useful knowledge for the overall scope of higher education transfers and success, it fails to consider the much larger number of community college students who were not successful at the two-year level for the various reasons cited above that are endemic to community college populations (Burrus et al., 2013).

Rural Access to Higher Education

Proximity to higher education locations near a student's primary residence leads to a greater likelihood of an individual's ultimate college attendance; this is especially true for underrepresented populations and those from lower socioeconomic backgrounds (Turley, 2009). This predominance to enroll in college close to home has many implications that institutions should be monitoring. Inman and Mayes (1999) came to the same conclusions with their subjects, first-generation community college students, who chose to enroll in colleges closer to home. This is further supported by Sowl and Crain's 2021 findings that proximity to higher education was the most common factor in school choice for rural students; their research further

highlighted the complexities of higher education access in rural areas and the necessity of institutions to address the topic. When this data are analyzed from the perspective of rural service areas, it becomes possible to see additional barriers that may impact the discussion of college commute distance and student retention rates. If colleges are not located in rural areas, then those residents may be less likely to seek out and enroll in higher education; research shows that proximity to higher education institutions even has an impact with students choosing on-line programs (Rinn, 2022).

Rural areas are some of the most likely to lack postsecondary access (Harmon et al., 2022). This is coupled with the recent declines of rural industry across many parts of the country, which has further elevated the necessity of a college education for chances of upward socioeconomic mobility (Marcus & Krupnick, 2017). As a result of decreased educational access points, rural students who want to enter college must therefore consider driving longer distances to access institutes of higher learning, when compared to their counterparts in more urban areas. College proximity data show that students living in rural areas are twice as far away, in miles, from their first-choice school (Turley, 2009). From that statistic, it is then reasonable to accept that rural students may be commuting a greater distance to college than their urban counterparts. This leads to the phenomenon of so-called "education deserts," areas with little to no higher education access point, which are endemic to rural regions and contribute to the perception and reality of higher education access issues for rural populations (Hillman & Weichman, 2016). Education deserts are scattered across the entire country and affect individuals from all walks of life. The necessity of proximity for higher education access is evident through Hillman (2019), who found that two-thirds of all undergraduate college students attend school within 25 miles of their home. This statistic considers both two- and four-year institutions. Community colleges,

due to their unique history and mission to deliver open-access higher education to all, serve over one-half of all students who reside within these educational deserts (Hillman & Weichman, 2016). Living in rural areas can have often severe implications for higher education access (Jackson, 2010).

Especially insightful for the literature review related to college commute distance and retention in rural America is the fact that students who reside in the southern United States have the fewest number of colleges located within commuting distance in comparison with all other regions of the country (Turley, 2009). The lack of opportunities within driving range could significantly decrease the likelihood of higher education enrollment and subsequently impact persistence and retention for those students who enroll. In addition to the physical absence of higher education opportunities, the permeating culture surrounding these areas with little to no access may also play a significant role in a student's ultimate success in college. The literature further supports the notion that as commute distances increase, the less likely students are to engage with and take advantage of academic and supportive resources that could bolster their ultimate success (Kuh et al., 2001). By requiring additional time to travel to and from campus, students begin to accrue a time deficit as referenced above that can take away critical opportunities to engage on campus with peers or faculty. In many cases, it is these extra interactions that can help increase student engagement and subsequently lead to persistence and success (Tinto, 2017; Walton & Cohen, 2007). Surveys of higher education access in rural areas, which comprise of the vast majority of the United States' land area, show a historical hyper fixation on the K-12 and community context that overlooks other equally important variables such as economic, social, and political attributes (Sowl & Crain, 2021). This focus on only a

portion of the variables at play in the overall higher education ecosystem may discount additional factors that could be equally decisive.

The often-cited barrier of economic depression found in rural areas leads to a student perception of lack of opportunities and options for potential rural students (Koricich et al., 2018). Economic trends such as local unemployment rates have long been tied to enrollment trends, especially for community colleges (Hillman & Orians, 2013). Of course, this perception is at times validated by statistical data. The cultural and societal implications of this have been shown to have direct correlations to college going rates in rural America, with significantly negative college enrollment rates based on rurality of student communities (Koricich et al., 2018). The compounded results of rural perceptions and realities can therefore have significant impacts on higher education access and enrollment.

The topic of in-state attendance of students to colleges and universities was explicitly studied in the University System of Georgia, which showed the important role that distance played in the enrollment process for students; increases in distance to the nearest college decreased the likelihood of enrollment (Alm & Winters, 2009). Findings also exist that indicate that distance could also be a significant variable in enrollment decision making, just as tuition and financial aid have long been viewed and researched. For example, Cooke and Boyle (2011) further the emphasis on location-based enrollment choices by analyzing important data related to high school residence and college enrollment based on location and proximity of higher education options. Unsurprisingly, students with limited access to nearby higher education access points ended up traveling significantly further to attend, if they decided to enroll at all (Cooke & Boyle, 2011). These studies continue to show the many disparities that arise from rural areas in relation to their accessibility to higher education sites.

Growth of Online Learning

Advances in technology throughout the nineteenth, twentieth, and twenty-first centuries have offered innovative approaches to higher education accessibility through the role of distance learning (Kentnor, 2015). Examples of such revolutionary approaches included radio and television, which were both highlighted in their respective eras as a new medium for college and university learning sources (Baum & McPherson, 2019). The same was true with the advent of the internet. The continued expansion and evolution of the internet over the last several decades has seen online distance learning evolve from another trend to a mainstay component of higher education offerings which serves nearly one-third of all college students, who are taking at least one online college course (Kentnor, 2015). The online course modality has offered a potential solution to the transportation and access barriers that are endemic to traditional in-person instruction as well. However, internet access and connectivity inequities throughout the country among many populations remains a significant barrier despite great technological advances (Shrier, 2021).

The disruption caused by the global COVID-19 pandemic was a direct catalyst of significant increases in use and focus on online learning for college students across both universities and community colleges (Kelly & Columbus, 2020). U.S. Department of Education (2021) statistics show the significance of the shift by comparing Fall 2019 and Fall 2020 enrollments for distance education courses across the nation. However, the upward trend of online college enrollments had been climbing steadily for years even prior to the pandemic; the number of U.S. college students enrolling in some online courses or all online courses increased each year from 2012-2016, while overall higher education enrollment decreased during the same time period (Xu, 2020). While weaknesses of online learning were highlighted during the

pandemic, it was the nation's history of nearly three decades of online or digital learning, made possible by the internet, which helped mitigate much of the potential downfall of forced virtualization during the COVID-19 lockdowns (Shrier, 2021). Now that the pandemic has come to an end, numbers of students returning to in-person classes have normalized, but not to pre-pandemic levels. In Fall 2021, 60% of all undergraduate students were enrolled in at least one online course (U.S. Department of Education, 2022).

Online versus On-ground Outcomes

Online college programs have been touted as a prospective fix to the "education dessert" problem that faces the 33 million Americans living in regions without any institution of higher education (Rinn, 2022). Even with the increased availability of online programs, research shows that distance still plays a critical role in enrollment decision making; nearly one-half of all online learners choose an institution located within 50 miles of their residence (Rinn, 2022). This further supports research across many fields that cite distance as one of the most common cited variables for accessibility to public and community services (Donnelly, 2015). Xu (2020) found that online courses lead to increased likelihoods of withdrawal for community college students when compared to those enrolled in face-to-face instruction. This impact on community college student success is exacerbated further when isolating more at-risk student populations, such as younger students under the age of 25 and African-American and Hispanic students (Hart et al., 2018). Protopsaltis and Baum (2019) found that educational outcome inequalities persistent among socioeconomic groups are widened when students take online courses. Xu and Jaggars (2014) highlighted similar findings for community and technical college students who, regardless of subgroups or academic programs of study, all showed decreased performance metrics compared to students taking on-ground, in-person courses. The performance gaps for students

taking online courses were worsened with stronger declines for male students, African-American students, younger students, and those with lower GPAs (Xu & Jaggars, 2014). Another study (Ortagus, 2023) also focused on community college students found that degree attainment was significantly lowered when students took all of their coursework online compared to those who took a smaller percentage of their course load online.

In addition to the quantitative findings related to the differences of student performance outcomes between online and face-to-face courses, Jaggars' 2014 qualitative study focused on students' perspective and reasoning for choosing their course modality. Flexibility and convenience were the highest cited reasons for community college students to choose an online class, with significant portions of those respondents bringing up employment and childcare needs as part of their reasoning (Jaggars, 2014). The overwhelming majority of the students in the study, all enrolled in a public community college, reported that they would not want to take all of their coursework online due to a lack of instructor and community presence. Others may not even have an option to take online courses due to inadequate internet access. Over five million adults across the United States do not have internet speeds capable of meeting the requirements to participate in online courses (Rosenboom & Blagg, 2018). The disparities found in the "digital divide" further bring attention to inequities of broadband internet access needed for online learning participation, compounding the issues of college accessibility (Kelly & Columbus, 2020).

Student Persistence and Success

The foundational work of Tinto's 1987 seminal model of student persistence has long been utilized to study potential factors related to why students stay enrolled and ultimately complete their education. The relationship of student persistence with the subsequent metrics of

retention and completion make this a topic that is critical to the higher education conversation. As funding formulas for intuitions are tied to these metrics, it is in the best interest of all organizations to better understand the underlying factors that may be at play when it comes to student persistence. Tinto (2017) defined student persistence as the individual's ability or commitment to successfully remain enrolled in their education program and ultimately complete by earning their degree. In its most basic sense, persistence is the drive that a person puts toward achieving an end-goal. From the perspective of higher education institutions that are dependent upon student persistence to lead to retention and completion, persistence is best analyzed through the lens of the student.

A key piece to this puzzle is the students' environment, both at home and on campus, their own self-efficacy, and sense of belonging at the institution. Many studies (e.g. Pascarella & Terenzini, 2005; Pratt et al., 2019; Tinto, 2017; Walton & Cohen, 2007) have found that a sense of student belonging, whether to peers, faculty, or the institution, can have a significant impact on that individual's ultimate persistence and subsequent success. In addition to the student lens and viewpoint, persistence can, and should, also be studied through the institutional perspective (Yu, 2017). Strauss and Volkwein (2004) conducted model analyses among two- and four-year student populations to learn that while two-year students lack many social integration opportunities compared to four-year students, both groups have overwhelmingly similar relationships between student-level predictors and institutional commitment.

Student persistence and success studies at the four-year level continue to develop and expand from Tinto's 1975 original model of student persistence, with increased attention and value being placed on the understanding of commitment in relation to persistence. Savage et al.'s 2019 four-year retention model was employed with full-time university students in an effort to

examine student persistence. The students' commitment to degree completion was studied alongside their perception of the institution's commitment to their own success. Findings showed a significant relationship between intended persistence and subsequent commitment after the student interacted with the institution (i.e., enrolled and began attending classes). As students progressed through their time at the institution, those who expressed the intention to persist from one semester to the next proved to commit and successfully retain from year to year. Interestingly, there were no significant differences between students who persisted and those who did not and their perceptions of the institution's commitment to them (Savage et al., 2019). This indicated the importance of student intent as it relates to persistence and gives further credence to Rusbult's 1983 investment model that has since helped highlight the role student satisfaction plays in subsequent student commitment and persistence. Similarly, Astin (1999) developed the student involvement theory, which in its simplest form, stated that student learning and development are directly related to the student's involvement in college. Again, this includes both involvement and engagement inside and out of the classroom.

Metzner and Bean's 1987 study was conducted at a four-year university on non-traditional students to better understand their reasons for attrition. A takeaway from this work was that Metzner and Bean found that students in the study ended up dropping out not due to social factors at the school but due to academic reasons such as GPA, full- and part-time status, and total credit hours attempted. Once more, the findings were only in relation to four-year university students and did not include community college students. Even so, a great deal of the variables analyzed could be associated with students at two-year colleges. The psychological variables of satisfaction and intent were again highlighted as strong predictors of dropping out, as well as the environmental factors of finances and external support (Metzner & Bean, 1987).

Each of these variables helps to give further complexity to the subject of student persistence and the several models used to better understand it. The findings of Hudacs (2020) furthered the known importance of family finances and academic readiness in the college persistence equation; that study took place at community colleges located in various types of rural settings and found these to be the most significant predictors of persistence and completion.

Okun et al. (1991) utilized investment and interdependence theories to further the research on understanding student persistence. These theories were popularized in work associated with employee engagement and retention and were then later utilized in the research of college student attrition and retention. It was found that similar to employees, college students commonly seek out a positive outcome value from their relationship with an institution of higher education (Okun et al., 1991). Their study focused on non-traditional, part-time community college students and found a strong negative correlation between student intent and student attrition. One finding of the study surrounded academic performance and retention; 77% of the students who left the institution during the study did not do so due to low GPAs, showing that many other factors that may be less observable could potentially have a greater impact on student decision making when it comes to persisting (Okun et al., 1991). This is aligned with surrounding literature on the topic of student persistence and environmental factors that can have an impact on ultimate retention (Metzner & Bean, 1987; Walton & Cohen, 2007).

Garza and Fullerton (2018) pointed out that there are many financial advantages to students who are able to live at home or near their college campus. However, they also claimed there may be a negative correlation with living at home and student persistence due to the potential obligations and distractions found around the home and family (Garza & Fullerton, 2018). These findings are supported by other researchers as well (Astin, 1999), and seem to be

independent of the commute distance associated with living off-campus. There is strong evidence that the social integration aspect of college life found through on-campus living at universities can have positive implications for student persistence and ultimately success (Pike & Kuh, 2005). Astin (1999) supported those findings as well and concluded that students who lived on-campus significantly increased their chances of persistence, even increasing their ultimate aspirations into graduate-level studies. These social integration variables are important considerations when analyzing the characteristics of first-time community college students who must commute to school. As Metzner and Bean (1987) concluded, Tinto's original theoretical model may not be the most valid when analyzing non-traditional students, a category which is made up largely of commuters.

Fong et al.'s 2017 meta-analysis of relevant research on psychological factors and community college student success indicated that both success and persistence can be predicated by motivation and self-perception. Their research ties together the critical relationship between student persistence and success and further highlights the pivotal role that psychological factors can have in this area. It also specifically highlights this relationship through the unique lens of community college students. Subsequently, Bean and Eaton (2000) developed a revised model of student retention and success that highlights the role and importance of psychological factors. They asserted that through thoughtful integration of institutional programs such as mentoring, learning programs, and freshman seminars, schools can proactively institute support structures for students to develop a healthy self-efficacy and relationship with the college that will ultimately lead to their retention and subsequent completion at the school. Along these lines, Harris and Wood (2016) developed their socio-ecological model that has been designed to address the specific characteristics associated with student retention and success for men of color

who are enrolled in community colleges. The model's need for such specificity shows once more how complex the variables associated with retention can be. Harris and Wood (2016) cited many of these same aforementioned variables such as social integration and external commitments, even mentioning transportation costs and commuting time specifically.

Student Retention at Community Colleges

Researchers have established through years of study the relationship between commitment and persistence, which ultimately leads to the end result of retention (Savage et al., 2019). Naturally, before students can successfully navigate higher education coursework and life, there must first be a level of commitment to the task at hand that leads to enrollment. That commitment then leads to a persistence to push through and return to class from semester to semester, ultimately culminating in successful degree completion. Hafer et al. (2021) showcased the imperative for community colleges nationwide to reimagine how student retention is tackled by developing their own model. As state and federal funding models transition to completion-based formulas, the necessary step of student retention must be improved in order to secure the longstanding role of higher education in our society. The researchers indicated a positive relationship between full-time student status and retention, showing that those students who enrolled in 12 or more credit hours per semester were more likely to complete and return for classes the next term (Hafer et al., 2021). Doyle (2011) studied community college students' trends in the number of credit hours taken during their first year of college as associated with their ultimate completion and transfer to a four-year university. Significant findings indicated a positive linear relationship between credits taken and probability of completion and transfer (Doyle, 2011). Further research with community college transfer students supports the early academic momentum theory and shows a significant, positive relationship between increased

credits hours attempted and the likelihood of transfer students obtaining a STEM degree at a four-year institution (Zhang, 2019). As Kopko and Crosta (2016) have shown, students who earn an Associate of Arts or Associate of Science degree at the community college level are significantly more likely to earn their bachelor's degree within six years. Students who attempt more credits, above the standard 12 credit hours per semester, during their first year have displayed significantly higher chances of retention and eventual completion compared to their peers taking fewer credits (Doyle, 2011; Zhang, 2019). These implications could be extremely beneficial for institutions engaged in improving retention and, ultimately, success rates (Huntington-Klein & Gill, 2021).

The importance of addressing community college retention is evident in the statistic that over one-half of all community college students attempting completion do not succeed in earning their credential (Shapiro et al., 2015). Not only do institutions of higher education face negative financial consequences due to low retention rates, students are also negatively impacted financially, both in the immediate and long-term, when they fail to stay enrolled. Seidman (2005) addressed this commonly overlooked dilemma in great detail and provides relevant formulas for both parties to address these disparities. Of primary importance for the institution is to first identify at-risk students early in the enrollment process to provide interventions that could help retain them (Seidman, 2005). Providing early interventions may allow the institution to mitigate many of the variables and risks that have long been known to negatively impact retention rates. Strauss and Volkwein (2004) also found that institutional commitment was influenced by student-level campus experiences, rather than from organizational features. This held true across both two- and four-year institutions in the study. They defined institutional commitment as the student's sense of belonging and commitment to the college and found that while there are

notable organizational variations between two- and four-year institutions, the differences of institutional commitment among the types of institutions were not significant (Strauss & Volkwein, 2004).

As community college students are at large a more diverse student body group and come with an increased proportion of various challenges and barriers to success, it is worth noting that Watson and Chen (2019) have found student support models are positively correlated with increased retention even among underrepresented groups, in spite of commonly found gender and race disparities. This gives further credence to the role that student support services can play in college retention. Yu's 2017 theoretical model of student retention has taken the focus directly to two-year institutions and students by utilizing data from across the country and from previous studies to more accurately predict and understand community college completion and success. Community college students often carry with them increased obligations and burdens when compared to their four-year peers; therefore, it is important to keep in mind how these characteristics might impact retention. Community college students are more likely than university students to be enrolled on a part-time basis. This status can lead to increased dropout rates and lack of completion (Yu, 2017). This type of student attrition is yet another example of the delicate nature of college retention, especially for community college students (Schneider, 2022). This point further emphasizes how important it is for college administrators to study college commuting distances and retention for community college students. It is however necessary to note that while these studies show specific successes for intervention and support models, retention rates at large have remained unchanged over the last several decades, even in spite of increases in these types of interventions (Seidman, 2005). This further complicates the current understanding and approach when it comes to addressing overall retention.

Mertes and Hoover (2014) studied first-year predictors of student retention on two separate cohorts of rural community college students. Following along with the established models of student retention in the literature, they further studied additional variables that have previously been omitted or overlooked in past research. Data analyses of these variables when comparing fall-to-fall retention rates yielded statistically significant findings related to the variables of high school GPA, age, gender, and program of study, which was consistent with the literature's established view (Mertes & Hoover, 2014). However, some of the findings changed between the three years separating the subject cohorts; for example, students in occupational programs of study in the first population group showed the highest retention rates for their population. Just three years later, the opposite was true, and students in occupational programs had the lowest retention rates. One possible explanation for this anomaly is the changes in the workforce economy and the impact that may have on occupational program retention (Mertes & Hoover, 2014).

The economy has direct ties to student enrollment rates in post-secondary education. This is especially true for community colleges where enrollment trends have a longstanding history of being counter-cyclical to those of the economy (Monaghan & Sommers, 2021). With significant economic downtowns such as the Great Recession, community colleges across the country saw sizable increases in enrollment. As unemployment decreases and the economy is strong, community colleges are also the first to lose students (Hillman & Orians, 2013). These economically-tied enrollment trends have a direct effect on student retention, as we see how students can be discouraged from attending college due to changes in the economy. Some of the reasoning behind these decisions to enroll or drop out due to the economy can be connected to the characteristics of community college missions and the specific makeup of the average

community college student. Kienzl et al. (2007) substantiated the increased volatility of community college students' persistence and retention rates during times of economic turmoil. Their research further indicated that as community college students tend to be most likely focused on occupational credentials and already working while enrolled they are at a higher predisposition to be swayed to dropout due to changes in the local economy (Kienzl et al., 2007). While both full- and part-time student enrollments are tied to the state of the local economy's employment rates, full-time enrollments are impacted more than those of part-time students; Hillman and Orians (2013) calculated this to be a 3.3% increase in full-time enrollment and 1.6 % increase in part-time enrollment for each 1% increase in unemployment rates. While unemployment is high students often feel the necessity to increase their educational attainment for hopes of increased employment. Likewise, when employers are hiring, it can be less enticing for individuals to spend time in class when they could be earning a wage.

Chapter 3. Research Method

This chapter includes an introduction to the research methodology, a list of the research questions and associated null hypotheses, instrumentation, population selection, data collection, and data analysis for this study. In order to compare retention rates for first-time, community college freshmen based on their respective one-way commute distance in miles, the research method utilized was a non-experimental, comparative quantitative approach. A quantitative method was chosen to test the study's research questions and explore any relationships present among the variables.

The purpose of this non-experimental, quantitative correlational study was to investigate whether the distance that students must travel to their college classes has any relationship to their retention rates. Potential relationships between distance traveled with full- and part-time student status, three-year graduation rates, credit hours attempted and completed, and GPA were also analyzed. Findings from this study could shed light on the topic of college retention rates in rural areas that may not have nearby higher education institutions. Additional outcomes could influence student retention opportunities, knowledge, and initiatives for institutions as they seek to improve student success and college accessibility.

All data in this study were collected from existing student records at the participating community college. Residential address ZIP codes were collected from the student records system through the institution's Office of Institutional Effectiveness, Research, and Planning as self-reported by students at time of enrollment. ZIP codes were utilized in place of full addresses to prevent any privacy issues related to students' personally identifiable information. The method of utilizing ZIP codes to calculate and study driving distance trends has been utilized across multiple research fields and by governmental agencies (Ando et al., 2021; Streetlight Data, 2018;

U.S. Census Bureau, 2023). One-way commute distance, in miles, from the students' residential ZIP code to the location of college classes was then calculated through Google Maps. The shortest drivable road distance was utilized in each case. All student metrics were collected from the same student record system, ensuring the consistency and integrity of said data, and reducing the risk for possible error in data collection.

This comparative statistical analysis among varying ranges of student commute distances and first-year retention rates provided additional insight into the role college commute distances may have on student success, particularly for first-time community college freshmen. Other variables were also analyzed to further the scope of this study's reach and provide a greater understanding of any other possible impacts and relationships college commute distance may have on students. For example, an analysis of data based on student status (full- or part-time) was designed to identify any correlations between commute distance and a student's likelihood to attempt more or less credit hours compared to students commuting in other mileage ranges. Self-reported gender was incorporated to identify any commuting trends between males and females. Likewise, data were analyzed for age groups to provide greater knowledge of generational trends when it comes to taking on a specific commute distance to attend college. Each of these analyses provided the academic community with correlational data that could be incorporated in the decision making process for future higher education policy.

Research Questions and Null Hypotheses

The following research questions and null hypotheses guided this research to identify any relationships between community college commute distance and retention, and other student success metrics:

Research Question 1

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and freshman to sophomore retention?

$H_0$1: There is not a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and freshman to sophomore retention.

Research Question 2

Is there a significant difference in overall GPA among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles?

$H_0$2: There is not significant difference in overall GPA among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles.

Research Question 3

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and their enrollment status (full- or part-time)?

$H_0$3: There is not a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and their enrollment status (full- or part-time).

Research Question 4

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and three-year graduation rate?

$H_0$4: There is not a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and three-year graduation rate.

Research Question 5

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and credits attempted in first semester (0-6 hours, 7-12 hours, 13-18 hours, or 19+ hours)?

$H_0$5: There is not a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and credits attempted in first semester (0-6 hours, 7-12 hours, 13-18 hours, or 19+ hours).

Research Question 6

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and credits completed in first semester (0-6 hours, 7-12 hours, 13-18 hours, or 19+ hours)?

$H_0$6: There is not a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and credits completed in first semester (0-6 hours, 7-12 hours, 13-18 hours, or 19+ hours).

Research Question 7

Is there a significant difference in overall credits attempted among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles?

$H_0$7: There is not a significant difference in overall credits attempted among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles.

Research Question 8

Is there a significant difference in overall credits completed among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles?

$H_0$8: There is not a significant difference in overall credits completed among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles.

Research Question 9

Is there a significant relationship between first semester GPA and overall GPA for community college commuter students who attend all of their classes in-person?

$H_0$9: There is not a significant relationship between first semester GPA and overall GPA for community college commuter students who attend all of their classes in-person.

Research Question 10

Is there a significant difference in age among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles?

$H_0$10: There is not a significant difference in age among students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles.

Research Question 11

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and gender (male or female)?

$H_0$11: There is not a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and gender (male or female).

Research Question 12

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and ethnicity (Asian, Black, Hispanic, White, or Other))?

$H_0$12: There is not significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and ethnicity (Asian, Black, Hispanic, White, or Other).

Research Question 13

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and the number of days per week attending class (1, 2, 3, 4, or 5)?

$H_0$13: There is not a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and the number of days per week attending class (1, 2, 3, 4, or 5).

Research Question 14

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and type of degree (AA, AS, or AAS) pursued?

$H_0$14: There is not a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and type of degree (AA, AS, or AAS) pursued.

Research Question 15

Is there a significant relationship between instructional site location (main campus or other) and three-year graduation for community college commuter students only taking in-person classes?

$H_0$15: There is not a significant relationship between instructional site location (main campus or other) and three-year graduation for community college commuter students only taking in-person classes.

Population and Sample

This study's population consisted of 1,320 community college students enrolled as first-time freshmen at a public community college in the southeastern United States. These individuals attended in-person classes at one of the college's four instructional sites at the start of the 2016-17 academic year. The participating institution does not offer on-campus housing, therefore all individuals in the study were considered commuter students and were thus categorized into smaller groups based on the number of miles they traveled to get to their instructional site. These subgroups were categorized as those traveling 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, and 61+ miles. The population consisted of community college first-time freshmen, including both traditional and non-traditional students from diverse experiences including various race, gender, ethnicity, and socioeconomic backgrounds. Students in the first-time freshmen population for the 2016-17 academic year who were not taking all in-person courses were excluded from the sample.

This study was conducted utilizing archival student data from a mid-sized community college, located in the Southeast. The participating college has four instructional site locations – a main campus located in a metropolitan area, two rural satellites, and one industry-partnered

training location (all included as part of this research). These four instructional locations serve the six-county region that comprises the college's official service area as outlined by the college's governing board. It is worth noting that this service area is made up of a diverse group of students and settings, serving both a large, urban metropolitan community, and many small, rural communities. According to the governing board student success captured in the form of first-year retention rate was at 50% at the participating institution for the 2020-21 school year, and the three-year graduation rate was at 22% for that same year (Tennessee Board of Regents, 2022). It would be beneficial to dig deeper into these statistics and analyze if commute distance had a relationship to these important student success metrics.

First-time freshmen entering the college during the Fall 2016 semester were identified for this study. Only those taking in-person instruction were selected, due to the study's focus on commute distance to class. Students enrolled in virtual, hybrid, or on-line courses were excluded from this data collection. Individuals taking online or virtual classes do not have to physically commute from home to campus for class, and would therefore skew the data as it relates to commute distances. Subsequently, of those whom were taking in-person courses beginning in the Fall 2016 semester, personal student data was collected from the Banner database system. This information included data across all of the study's variables – student's home ZIP code and location of instruction, full- or part-time enrollment status, credit hours attempted and completed, three-year graduation outcome, age, gender, ethnicity, and GPA.

This study's sample consisted of nonprobability convenience sampling based on the required study variables. All sample subjects were considered first-time college freshmen and attended the same public community college.

Data Source

This study utilized archival student data accessed through the participating college's Office of Institutional Effectiveness, Research, and Planning (IERP). All student data (student's residential ZIP code, location of classes taken, GPA, credit hours attempted and completed, graduation status, age, gender, and ethnicity) involved in this study were recorded and stored on the college's integrated database system, Ellucian Banner, most commonly referred to simply as Banner. The Banner system serves as the central data storage point for all student information. From the moment an individual applies to the college, they have an entry in Banner containing all the requisite information needed for a college application. As the individual progresses through the application process, is admitted, and finally completes coursework, all associated data with those activities are recorded in the system. Each department of the college has varied access to Banner based on their specific departmental functions. For example, the Admissions department monitors all data related to student admission; academic divisions handle their specific academic course data and final grades. The college's Office of IERP has full access to the system and serves as the department in charge of managing access for research that falls outside of typical department-specific system access.

Data Collection

This study's dissertation committee first reviewed and approved this proposed plan of research. Upon approval from the committee, a formal request for review was made to East Tennessee State University's Internal Review Board (IRB). Data collected for this research were then obtained through a formal request to the study institution's Office of IERP. Upon approval to proceed from both the study institution's IERP administrator and ETSU's IRB, archival student data pertaining to the research questions was collected from the institution's student

information system, Ellucian Banner. These data were sent via email and in the form of an Excel spreadsheet from the Office of IERP. All student information such as home ZIP code, gender, age, academic records, and any other information utilized for this study was housed in the Ellucian Banner system. As this data make up the official student and academic file it is recognized as consistent and reliable for the purpose of this study. All student identifications were coded by the study institution's IERP prior to being provided to the researcher. No personally identifiable information was viewed by the researcher for this study.

Data Analysis

Research Questions 1, 3, 4, 5, 6, 11, 12, 14, and 15 were analyzed using chi-square tests; Research Questions 2, 7, 8, 10, and 13 were analyzed using a one-way analysis of variance (ANOVA). Research Question 9 was analyzed by computing a Pearson correlation coefficient. An alpha level of .05 was used to test for all levels of significance in this study. The factor variable in each research question was the commute distance in miles, categorized in five levels: 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, and 61+ miles. Post-hoc analysis was conducted for any significant findings that were identified among the groups in each question. In that instance, Tukey's Honest Significant Difference (HSD) test was then utilized to identify where those significant differences existed.

One-way commute distances were calculated by utilizing Google Maps' driving directions feature. The student's ZIP code of primary residence was keyed as the origin point, and the location of college classes as the destination. Distance was then calculated, in miles, using the shortest drivable road distance between the two points. Each student was then grouped into one-way commute distance levels (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, and

61+ miles) to account for any possible variances in distance between ZIP code center and student's home.

Chapter Summary

This chapter provided a detailed description of my research methodology and purpose statement. Additionally, all of the research questions and their respective null hypotheses were outlined. The study's instrumentation, population and sample characteristics, and data collection and analyses procedures were also described. A quantitative research method was utilized to identify possible relationships between college commute distances and student retention rates for first-time community college freshmen.

Chapter 4. Findings

The purpose of this study was to examine the relationship between commute distance and freshman to sophomore retention for first-time, community college freshmen commuting to in-person classes. Student archival data from the Fall 2016 incoming class at a public, two-year community college located in the southeastern United States were analyzed to evaluate the research questions. Data associated with each research question and its relationship with student commute distances were analyzed and presented in this chapter. Chi-square test, one-way analysis of variance (ANOVA), and Pearson correlation coefficient were used as appropriate to determine if a significant relationship existed between variables.

Description of Data

The data requested for this study included students' residential ZIP codes, campus of attendance, enrollment status (full- or part-time), days attending class per week, age, gender, ethnicity, degree of study, credit hours attempted and completed for first semester, total credit hours attempted and completed overall, first term GPA, overall GPA, retention, and three-year graduation status. Only students entering the Fall 2016 semester as first-time freshmen were included in this study. To align with this study's focus on commuting students, individuals who took any online or hybrid format coursework were excluded from the data collection. All data were collected and anonymized by the participating institution's Office of Institutional Effectiveness, Research, and Planning. All personally identifiable information was removed prior to the data being provided.

Subject Demographics

The total number of individual students who met the abovementioned criteria and were included in this study equaled 1,320. Of that population, 609 (46%) identified as male and 711

(54%) identified as female. In terms of ethnicity, 69% of the group identified as White, 17% Black or African American, 8% Hispanic, 4% Other, and 2% Asian. The mean age of the group was 19, with a standard deviation of 3.61.

Research Question 1

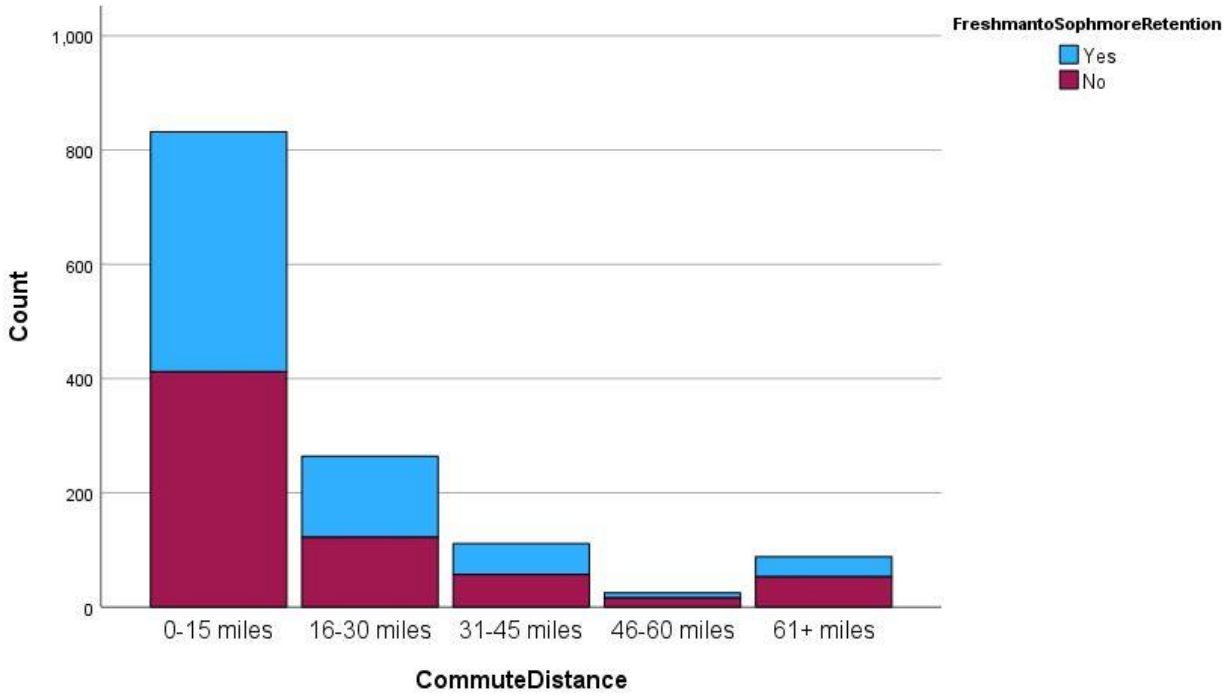
Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and freshman to sophomore retention?

$H_0$1: There is not a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and freshman to sophomore retention.

A chi-square test of independence was conducted to evaluate the relationship between one-way community college student commute distance and freshman to sophomore retention for community college students. The two variables were commute distance (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and freshman to sophomore retention (yes or no). Student commute distance and freshman to sophomore retention were not found to be significantly related, Pearson $\chi^2(4, N = 1{,}320) = 7.34$, $p = .120$, Cramer's $V = .074$. Therefore, the null hypothesis was retained. Commuting distance was not a factor in whether students were retained from freshman to sophomore years. Total freshman to sophomore retention equaled approximately 50% across the population, and was evenly distributed across each commute distance range group as seen in Figure 1.

Figure 1

Freshman to Sophomore Retention Rates among Commute Distance Groups



Research Question 2

Is there a significant difference in overall GPA among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles?

$H_0$2: There is not significant difference in overall GPA among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles.

A one-way analysis of variance (ANOVA) was conducted to evaluate the relationship between overall GPA and community college student commute distance. The factor variable, the commute distance, included five levels: 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, and 61+ miles. The dependent variable was overall GPA. The ANOVA was not significant, $F(4,1350) = 1.962$, $p = .098$. Therefore, the null hypothesis was retained. The strength of the relationship between the commute distance and overall GPA, as assessed by η^2, was small

(.006). The results indicate that overall GPA was not significantly related to the students' commute distance. The means and standard deviations of overall GPA for the five commute distance groups are reported in Table 1. Figure 2 provides visual representation of overall GPA among the commute distance groups.

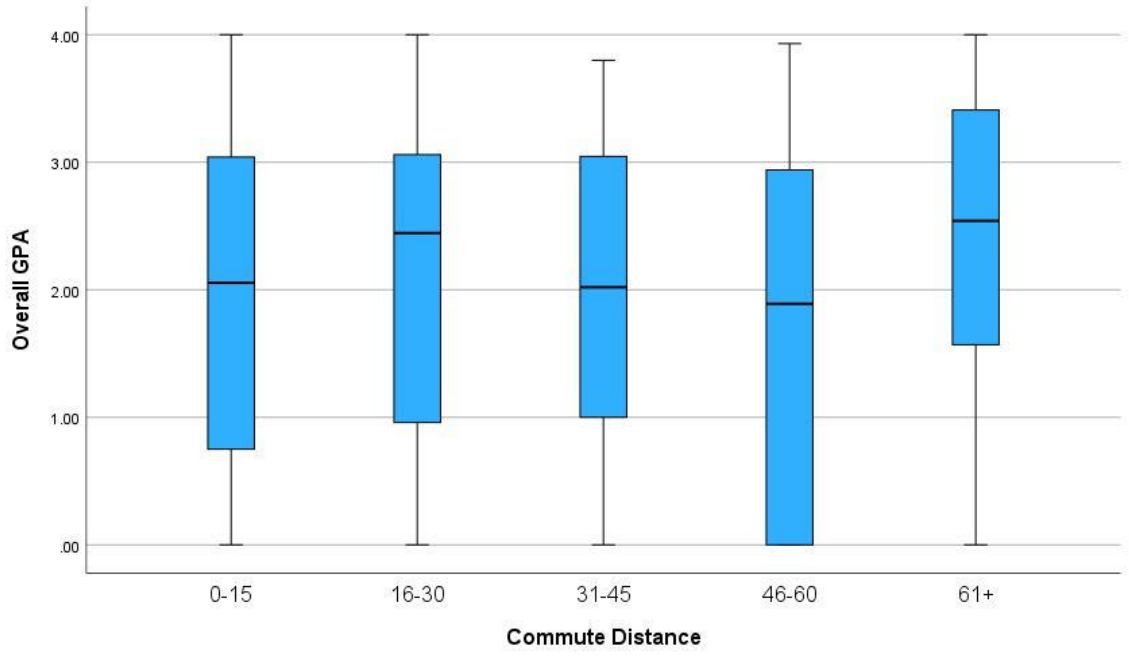
Table 1

Means and Standard Deviations of Overall GPA for Commute Distance Groups

Commute Distance	M	SD	N
0-15 miles	1.93	1.30	832
16-30 miles	2.06	1.26	264
31-45 miles	1.95	1.25	111
46-60 miles	1.81	1.54	25
61+ miles	2.28	1.28	88
Total	1.98	1.29	1320

Figure 2

Overall GPA among Commute Groups



Research Question 3

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and their enrollment status (full- or part-time)?

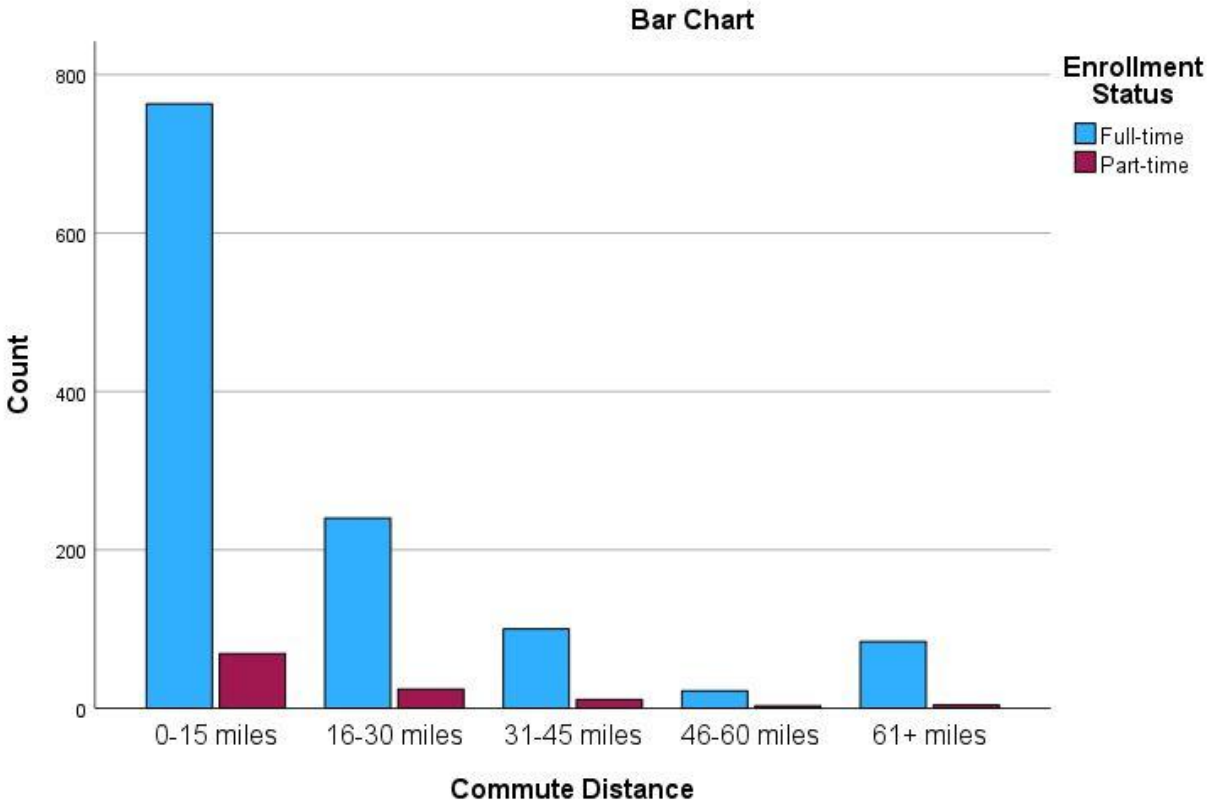
$H_0$3: There is not a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and their enrollment status (full- or part-time).

A chi-square test of independence was conducted to evaluate the relationship between one-way community college student commute distance and enrollment status for community college students. The two variables were commute distance (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and enrollment status (full-time or part-time). Student commute distance and enrollment status were not found to be significantly related, Pearson χ^2(4,

N = 1,320) = 2.62, p = .623, Cramer's V = .045. Therefore, the null hypothesis was retained. Commuting distance was not related to enrollment status. The commute distance group with the largest percentage of full-time students was the 61+ mile range, with 95% of those students enrolling full-time. Enrollment status count by commute distance group is displayed in Figure 3.

Figure 3

Enrollment Status by Commute Group



Research Question 4

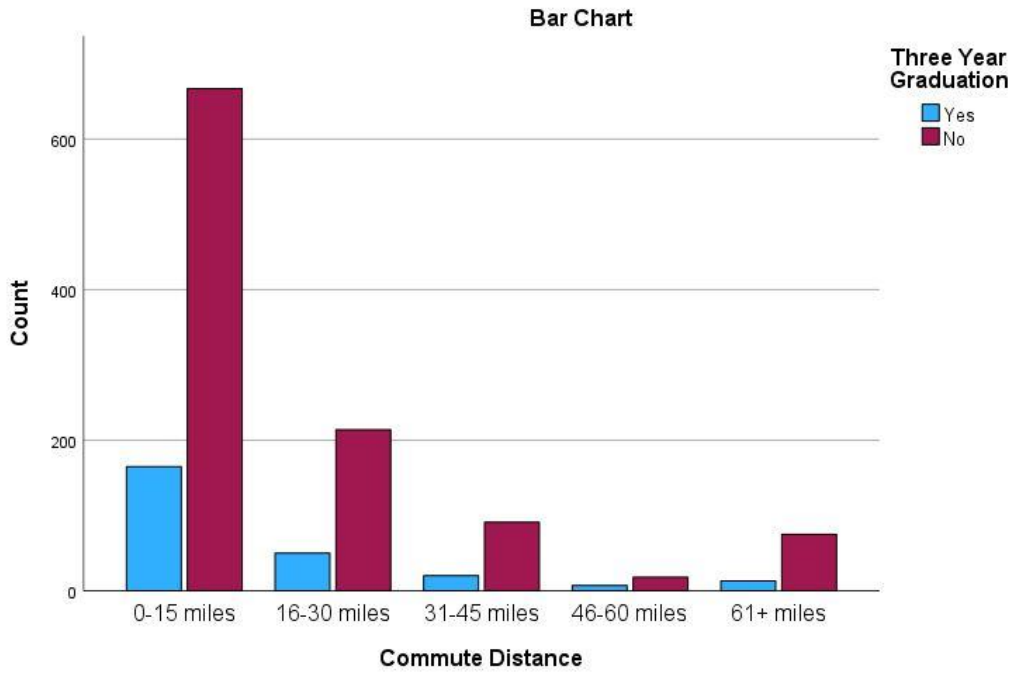
Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and three-year graduation rate?

$H_0$4: There is not a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and three-year graduation rate.

A chi-square test of independence was conducted to evaluate the relationship between one-way community college student commute distance and three-year graduation rates. The two variables were commute distance (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and three-year graduation outcome (yes or no). Student commute distance and three-year graduation were not found to be significantly related, Pearson $\chi^2(4, N = 1{,}320) = 2.66$, $p = .616$, Cramer's $V = .045$. Therefore, the null hypothesis was retained. Commuting distance was not related to whether or not students graduated within three years of starting school. Figure 4 shows a small, yet not significant, decrease in three-year graduate rate as commute distance increases.

Figure 4

Three-year Graduation Results Compared to Commute Distance



Research Question 5

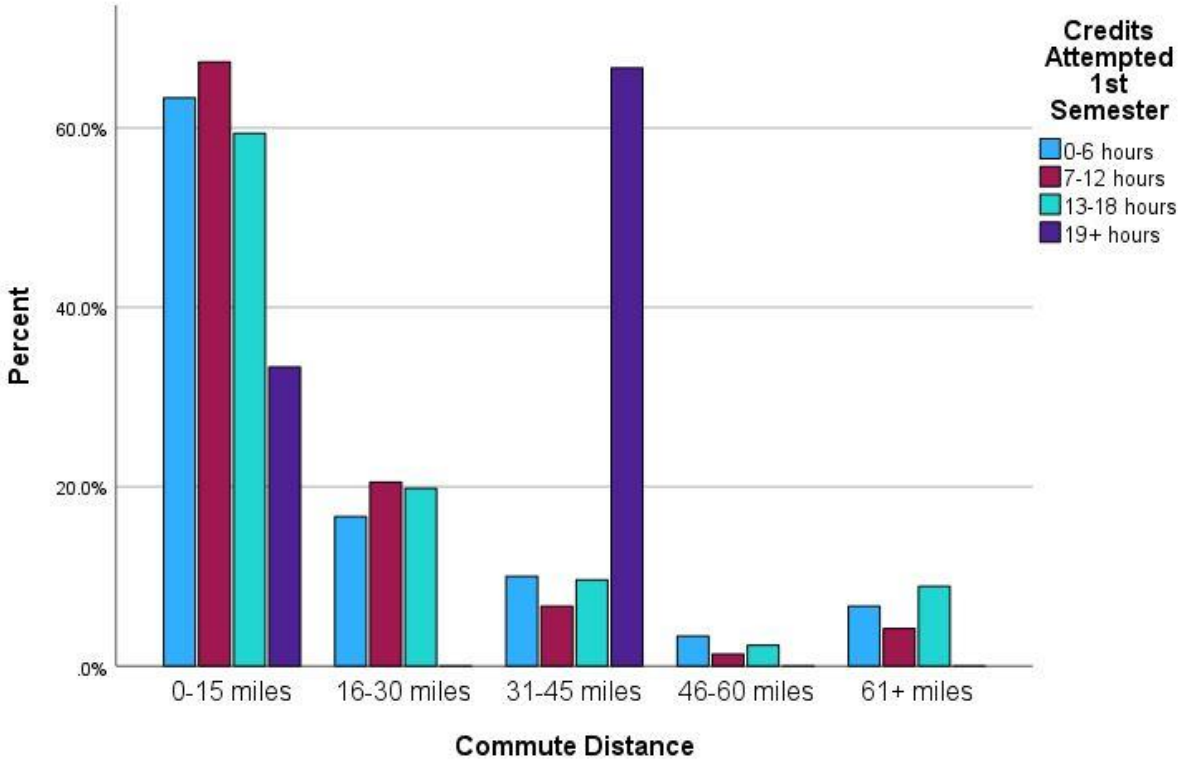
Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and credits attempted in first semester (0-6 hours, 7-12 hours, 13-18 hours, or 19+ hours)?

$H_0$5: There is not a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and credits attempted in first semester (0-6 hours, 7-12 hours, 13-18 hours, or 19+ hours).

A chi-square test of independence was conducted to evaluate the relationship between one-way community college student commute distance and credit hours attempted during the students' first semester. The two variables were commute distance (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and credit hours attempted during first semester (0-6 hours, 7-12 hours, 13-18 hours, or 19+ hours). Student commute distance and credit hours attempted during first semester were found to be significantly related, Pearson $\chi^2(12, N = 1{,}320) = 32.96$, $p < .001$, Cramer's $V = .091$. Therefore, the null hypothesis was rejected. Commuting distance was a factor in the number of credit hours attempted during a student's first semester. Students with higher commute distances were likely to attempt more credit hours in their first semester. Students in the 31-45 mile group were significantly more likely to attempt 19+ hours compared to students in any other commute distance group. The commuting group of 61+ miles had a significantly greater percentage of students attempting 13-18 hours during their first semester compared to any other credit range for that group of commuters. The commute distance groups and respective credit hours attempted are shown in Figure 5.

Figure 5

Credit Hours Attempted in First Semester Grouped by Commute Distance



Research Question 6

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and credits completed in first semester (0-6 hours, 7-12 hours, 13-18 hours, or 19+ hours)?

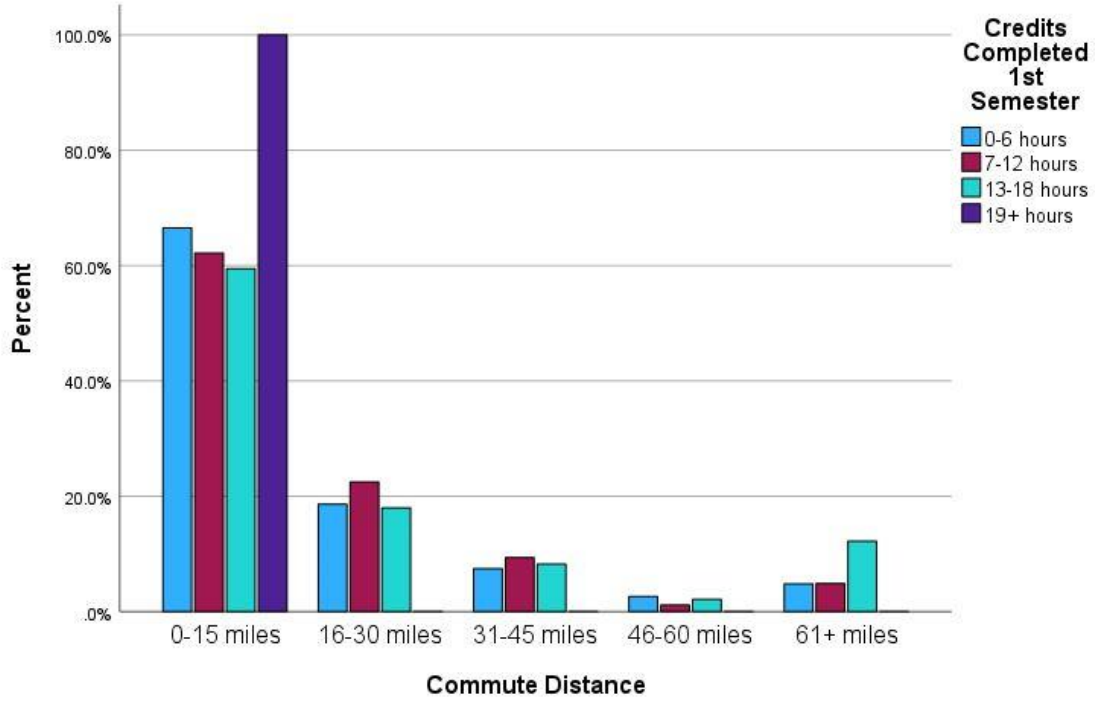
$H_0$6: There is not a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and credits completed in first semester (0-6 hours, 7-12 hours, 13-18 hours, or 19+ hours).

A chi-square test of independence was conducted to evaluate the relationship between one-way community college student commute distance and credit hours completed during the students' first semester. The two variables were commute distance (0-15 miles, 16-30 miles, 31-

45 miles, 46-60 miles, or 61+ miles) and credit hours completed during first semester (0-6 hours, 7-12 hours, 13-18 hours, or 19+ hours). Student commute distance and credit hours completed during first semester were found to be significantly related, Pearson $\chi^2(12, N = 1{,}320) = 29.09$, $p = .004$, Cramer's $V = .086$. Therefore, the null hypothesis was rejected. Commuting distance was a factor in the number of credit hours completed during a student's first semester. Students with the longest commute distance (61+ miles) were found to be significantly less likely to complete 0-6 hours and 7-12 hours in their first semester compared to their peers in the other commute groups. Those in the 61+ mile group were also found to be significantly more likely to complete between 13-18 hours compared to the other groups. Figure 6 shows the credit hours completed in first semester grouped by commute distance.

Figure 6

Credit Hours Completed in First Semester Grouped by Commute Distance



Research Question 7

Is there a significant difference in overall credits attempted among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles?

$H_0$7: There is not a significant difference in overall credits attempted among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles.

A one-way analysis of variance (ANOVA) was conducted to evaluate the relationship between overall credits attempted and community college student commute distance. The factor variable, the commute distance, included five levels: 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, and 61+ miles. The dependent variable was overall credits attempted. The ANOVA was not significant, $F(4,1315) = 1.182$, $p = .317$. Therefore, the null hypothesis was retained. The strength of the relationship between the commute distance and overall credits attempted, as assessed by η^2, was small (.004). The results indicate that overall credits attempted was not significantly related to the students' commute distance. The means and standard deviations of overall credits attempted for the five commute distance groups are reported in Table 2. Figure 7 displays the overall credits attempted as grouped by commute distance.

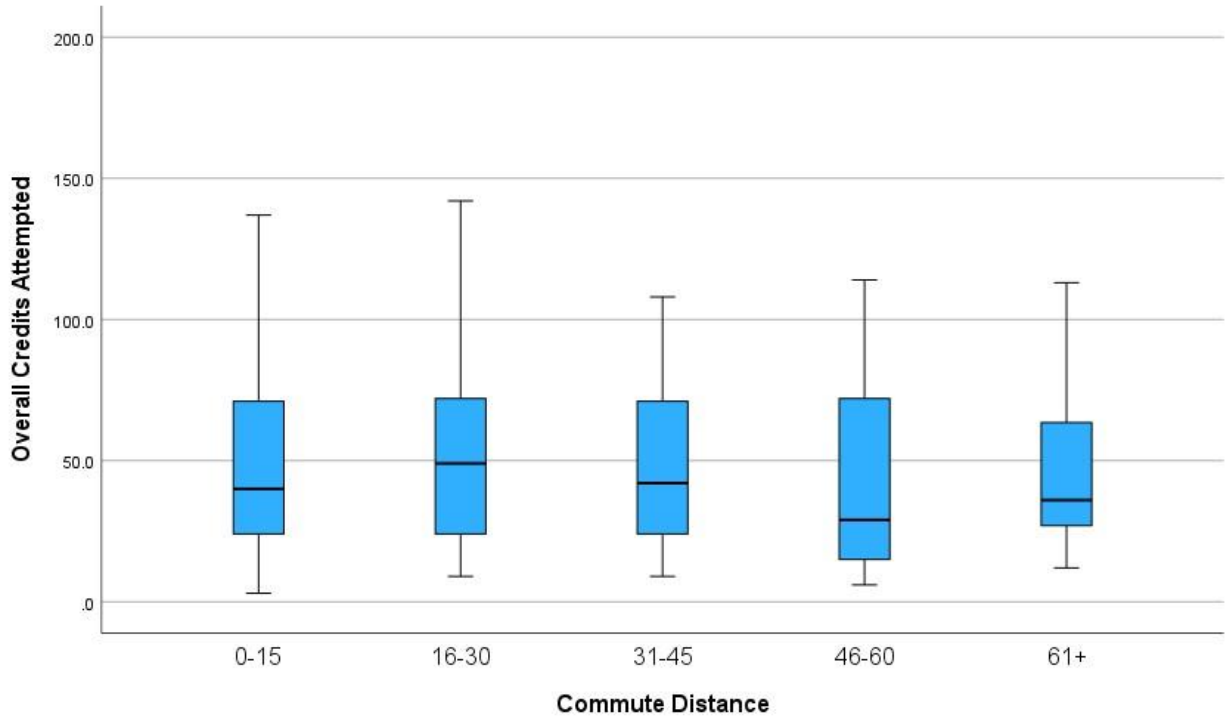
Table 2

Means and Standard Deviations of Overall Credits Attempted, According to Commute Group

Commute Distance	M	SD	N
0-15 miles	48.34	31.44	832
16-30 miles	51.40	31.67	264
31-45 miles	46.02	27.40	111
46-60 miles	42.32	31.72	25
61+ miles	45.85	25.69	88
Total	48.47	30.83	1320

Figure 7

Overall Credits Attempted by Commute Distance Group



Research Question 8

Is there a significant difference in overall credits completed among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles?

$H_0$8: There is not a significant difference in overall credits completed among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles.

A one-way analysis of variance (ANOVA) was conducted to evaluate the relationship between overall credits completed and community college student commute distance. The factor variable, the commute distance, included five levels: 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, and 61+ miles. The dependent variable was overall credits completed. The ANOVA was not significant, $F(4,1315) = 1.028$, $p = .391$. Therefore, the null hypothesis was retained. The strength of the relationship between the commute distance and overall credits completed, as assessed by η^2, was small (.003). The results indicate that overall credits completed was not significantly related to the students' commute distance. Table 3 shows the means and standard deviations of overall credits completed for the five commute distance groups. Figure 8 displays the overall credits completed across each commute distance group.

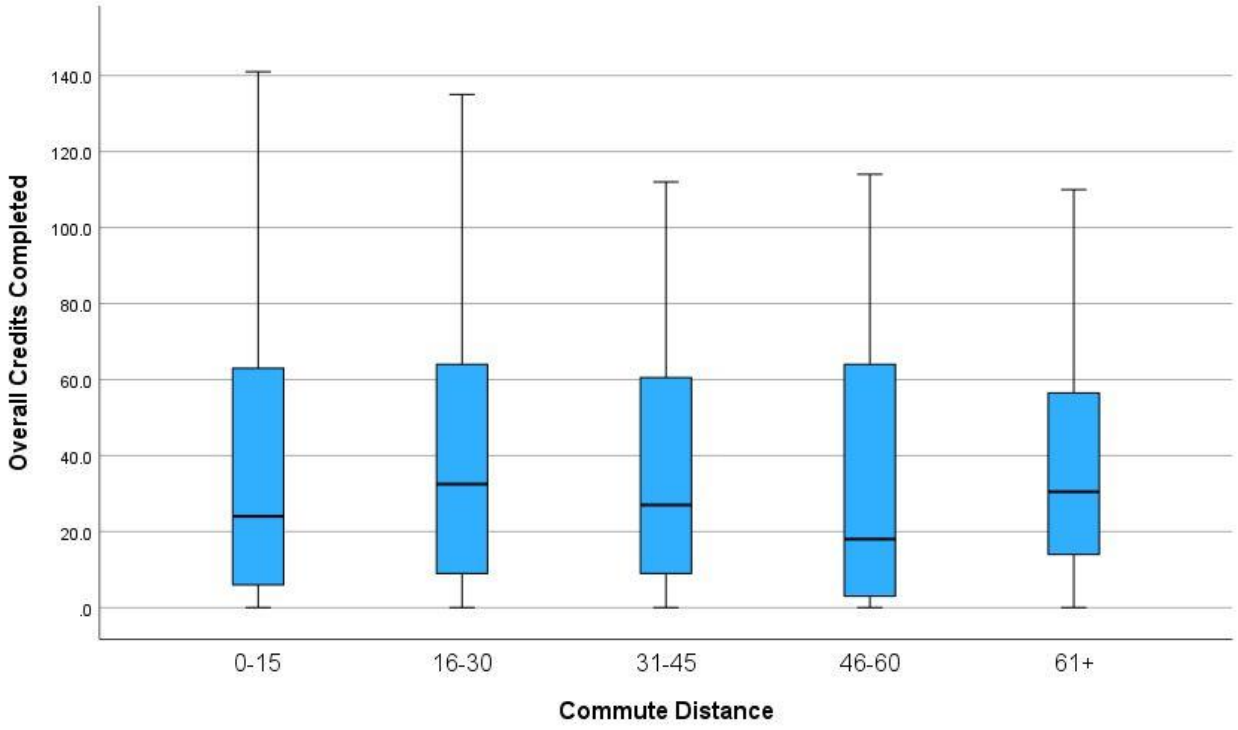
Table 3

Means and Standard Deviations of Overall Credits Completed, According to Commute

Commute Distance	M	SD	N
0-15 miles	34.33	31.74	832
16-30 miles	38.43	31.81	264
31-45 miles	34.12	28.91	111
46-60 miles	30.80	34.00	25
61+ miles	34.98	25.36	88
Total	35.11	31.19	1320

Figure 8

Overall Credits Completed by Commute Group



Research Question 9

Is there a significant relationship between first semester GPA and overall GPA for community college commuter students who attend all of their classes in-person?

$H_0$9: There is not a significant relationship between first semester GPA and overall GPA for community college commuter students who attend all of their classes in-person.

A Pearson correlation coefficient was computed to evaluate whether there was a significant relationship between first semester GPA and overall GPA for community college commuter students attending all in-person classes. There was a significant, positive correlation found between the first semester GPA (M = 2.25, SD = 1.46) and overall GPA (M = 1.98, SD = 1.29), $r(1,319) = .825$, $p < .001$. Therefore, the null hypothesis was rejected. The results suggest that community college commuter students who attend all in-person classes and earn high first semester GPAs will likely have high overall GPAs. Conversely, students who perform poorly during their first semester will be statistically be less likely than their peers with higher GPAs to earn a high overall GPA. Table 4 shows the mean and standard deviations for first semester GPA compared to overall, final GPA.

Table 4

Means and Standard Deviations for First Semester GPA and Overall GPA of Commuter Students

	M	N	SD	SEM
First Semester GPA	2.25	1320	1.46	.04
Overall GPA	1.98	1320	1.29	.034

Research Question 10

Is there a significant difference in age among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles?

$H_0$10: There is not a significant difference in age among community college students who commuted 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles.

A one-way analysis of variance (ANOVA) was conducted to evaluate the relationship between community college student age and commute distance. The factor variable, the commute distance, included five levels: 0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, and 61+ miles. The dependent variable was age of the student. The ANOVA was not significant, $F(4,1315) = 1.847$, $p = .117$. Therefore, the null hypothesis was retained. The strength of the relationship between the student age and commute distance was small, $\eta^2 = .006$. The results indicate that age was not significantly related to the distance a student commuted. Table 5 shows the means and standard deviations of student age for each of the five commute distance groups.

Table 5

Means and Standard Deviations of Student Age Grouped by Commute Distance

Commute Distance	M	SD	N
0-15 miles	19.28	3.89	832
16-30 miles	18.85	2.91	264
31-45 miles	19.05	3.84	111
46-60 miles	19.24	4.62	25
61+ miles	18.33	1.42	88
Total	19.11	3.61	1320

Research Question 11

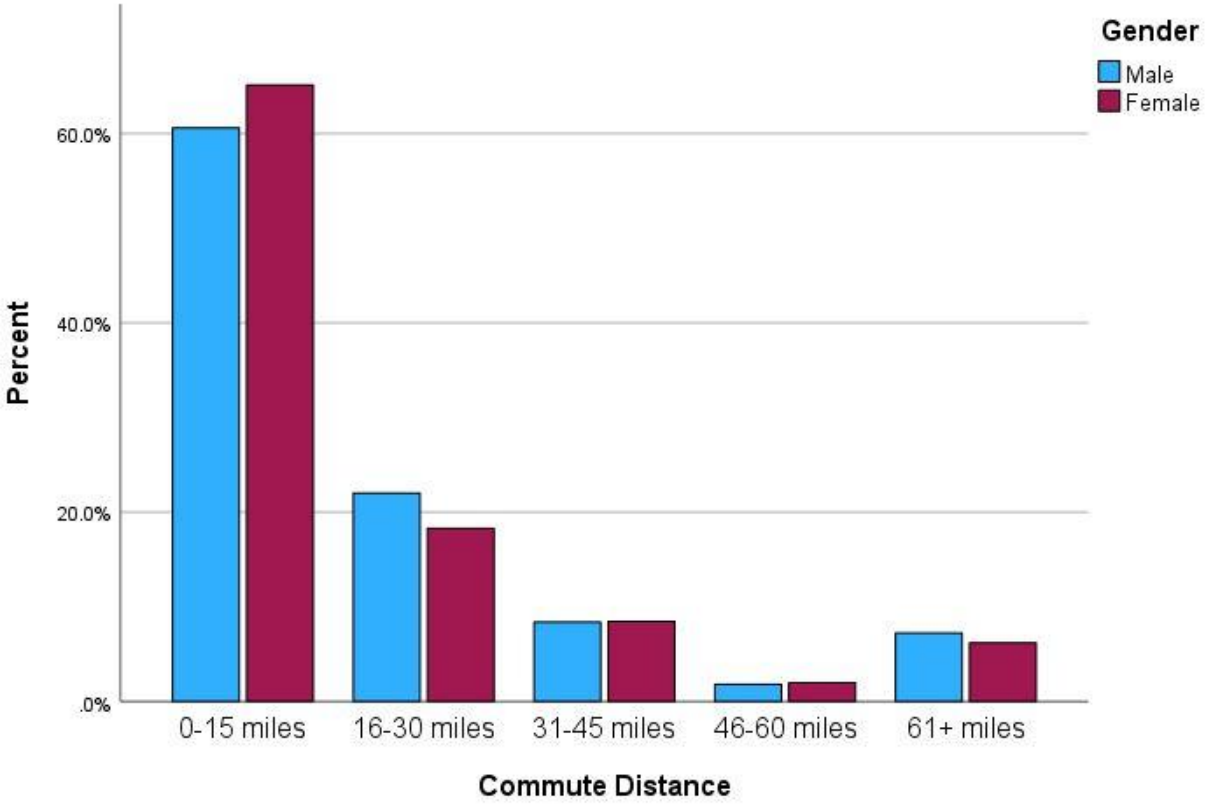
Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and gender (male or female)?

$H_0$11: There is not a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and gender (male or female).

A chi-square test of independence was conducted to evaluate the relationship between one-way community college student commute distance and gender. The two variables were commute distance (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and identified gender (male or female). Student commute distance and gender were not found to be significantly related, Pearson $\chi^2(4, N = 1{,}320) = 3.91$, $p = .418$, Cramer's $V = .054$. Therefore, the null hypothesis was retained. Students' identified gender was related to the distance they commuted. A breakdown of gender across the commute distance groups is displayed in Figure 9.

Figure 9

Student Gender by Commute Distance



Research Question 12

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and ethnicity (Asian, Black, Hispanic, White, or Other)

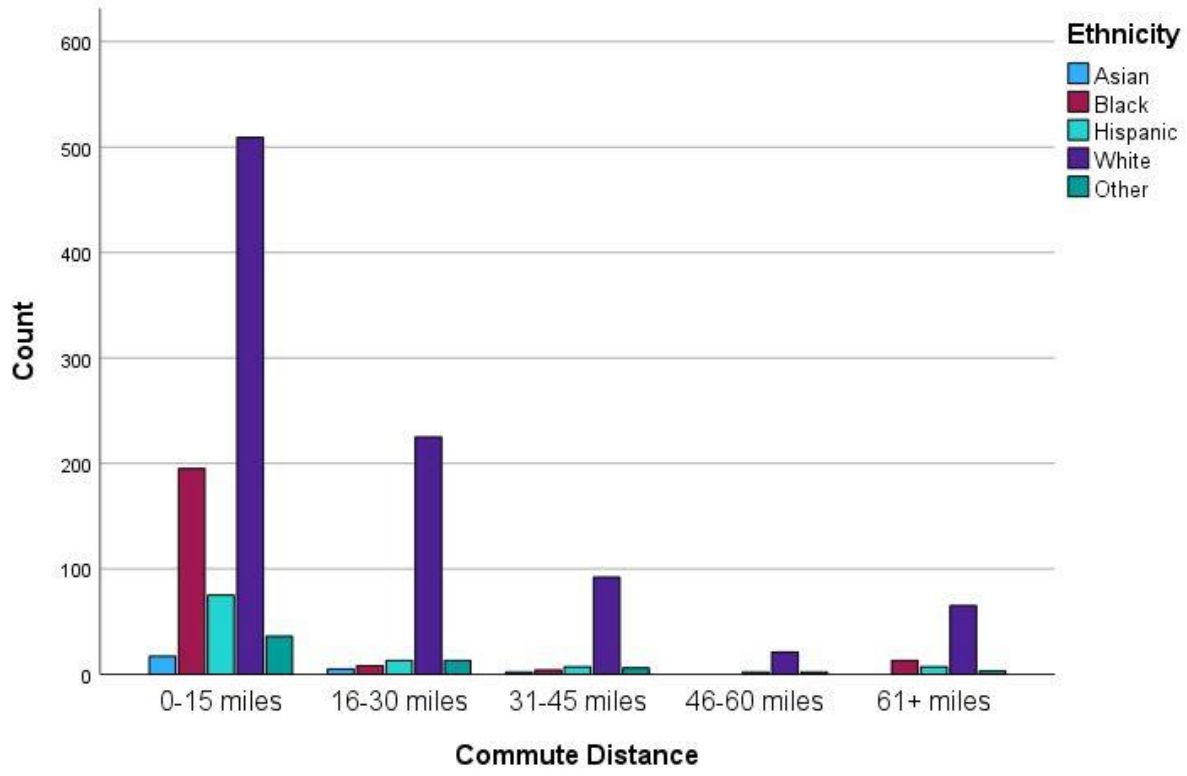
$H_0$12: There is not significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and ethnicity (Asian, Black, Hispanic, White, or Other).

A chi-square test of independence was conducted to evaluate the relationship between one-way community college student commute distance and student ethnicity. The two variables were commute distance (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and

ethnicity (Asian, Black, Hispanic, White, or Other). Student commute distance and ethnicity were found to be significantly related, Pearson $\chi^2(16, N = 1{,}320) = 97.89$, $p < .001$, Cramer's V = .136. Therefore, the null hypothesis was rejected. The results indicate that some ethnicities share significant relationships with commute distance groups. For example, Black and Hispanic students were significantly more likely to commute in the 0-15 mile range than White students, and conversely less likely to commute in the 16-30 mile range than White students. Black students were significantly less likely than Hispanic and White students to be in the longer distance groups as well (31-45 miles and 46-60 miles). White students were significantly more likely to drive further than other ethnicities, with larger representations in the 16-30 mile and 31-45 mile ranges. There were no significant differences detected among ethnicities in the furthest commute distance group of 61+ miles. Figure 10 shows the representation of ethnicity by commute distance group.

Figure 10

Ethnicity Representation by Commute Distance Group



Research Question 13

Is there a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and the number of days per week attending class (1, 2, 3, 4, or 5)?

$H_0$13: There is not a significant relationship between one-way community college student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and the number of days per week attending class (1, 2, 3, 4, or 5).

A one-way analysis of variance (ANOVA) was conducted to evaluate the relationship between one-way community college student commute distance and the number of days per week attending class. The factor variable, the commute distance, included five levels: 0-15 miles,

16-30 miles, 31-45 miles, 46-60 miles, and 61+ miles. The dependent variable was days per week attending class. The ANOVA was significant, $F(4,1315) = 2.913$, $p = .021$. Therefore, the null hypothesis was rejected. The strength of the relationship between the commute distance and days per week attending class was small at $\eta^2 = .009$. The results indicate that the number of days per week a student had to attend class was significantly related to commute distance. Students commuting in the longest commute group of 61+ miles were significantly more likely to attend class five days per week compared to students in the other commute groups. The means and standard deviations of days per week attending class for the five commute distance groups are reported in Table 6. Figure 11 displays the number of days for weekly class attendance by commute distance group.

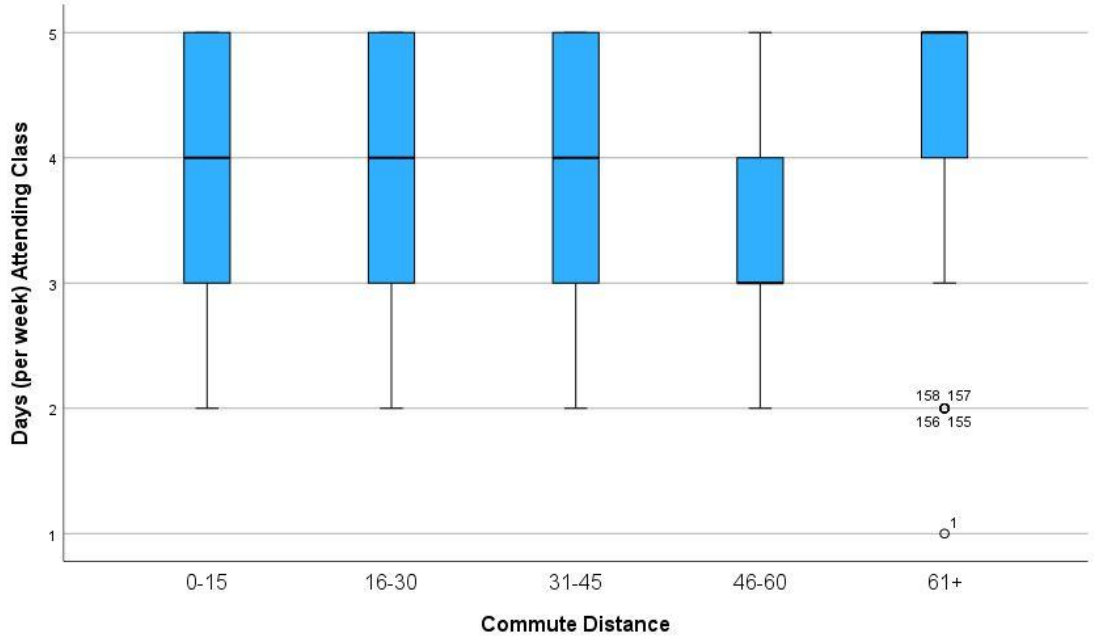
Table 6

Means and Standard Deviations of Days per Week Attending Class by Commute Distance Group

Commute Distance	M	SD	N
0-15 miles	3.96	1.06	832
16-30 miles	3.91	1.05	264
31-45 miles	3.95	1.09	111
46-60 miles	3.64	.95	25
61+ miles	4.30	1.02	88
Total	3.97	1.06	1320

Figure 11

Days Attending Class Weekly by Commute Distance



Research Question 14

Is there a significant relationship between one-way student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and type of degree (AA, AS, or AAS) pursued?

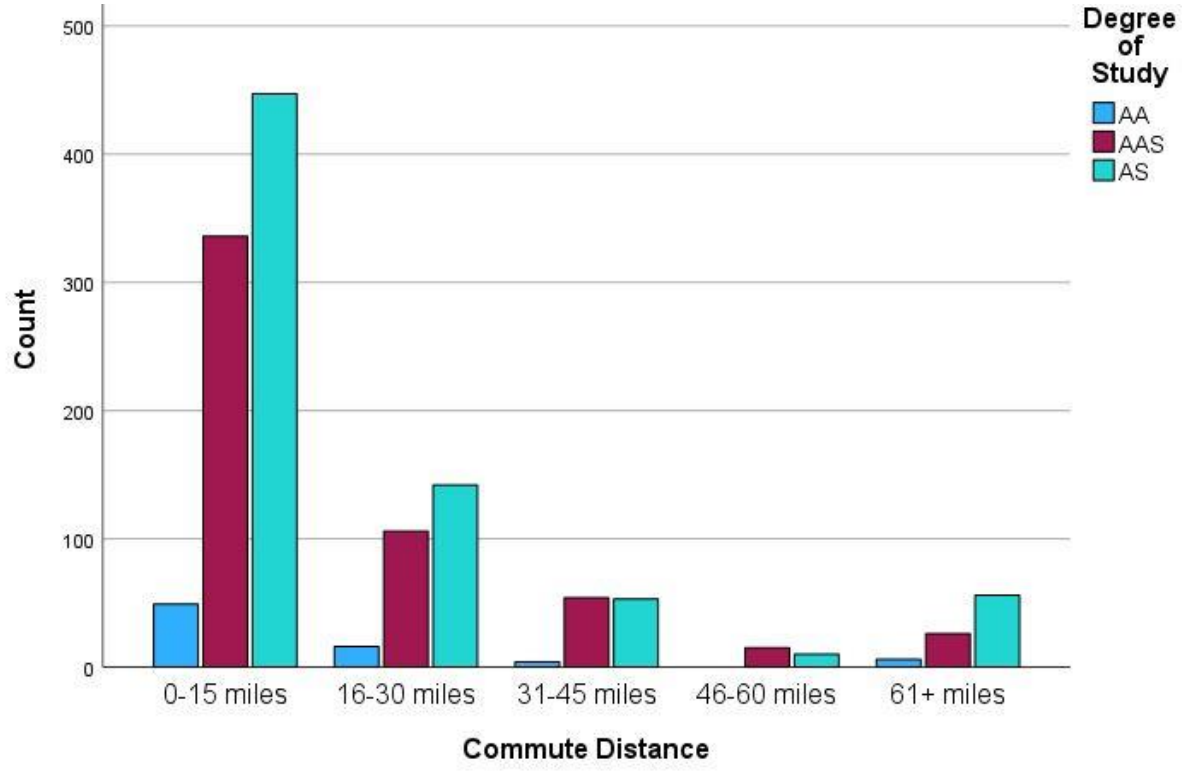
$H_0$14: There is not a significant relationship between one-way student commute distances (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and type of degree (AA, AS, or AAS) pursued.

A chi-square test of independence was conducted to evaluate the relationship between one-way student commute distance and type of degree pursued. The two variables were commute distance (0-15 miles, 16-30 miles, 31-45 miles, 46-60 miles, or 61+ miles) and degree of study (Associate of Arts, Associate of Science, or Associate of Applied Science). Student commute distance and degree of study were not found to be significantly related, Pearson $\chi^2(8, N = 1{,}320)$

= 12.57, p = .128, Cramer's V = .069. Therefore, the null hypothesis was retained. Commute distance was not related to students' chosen degree of study. The representation of degree selection among commute distance groups remained approximately dispersed proportionally as shown in Figure 12.

Figure 12

Degree of Study by Commute Distance



Research Question 15

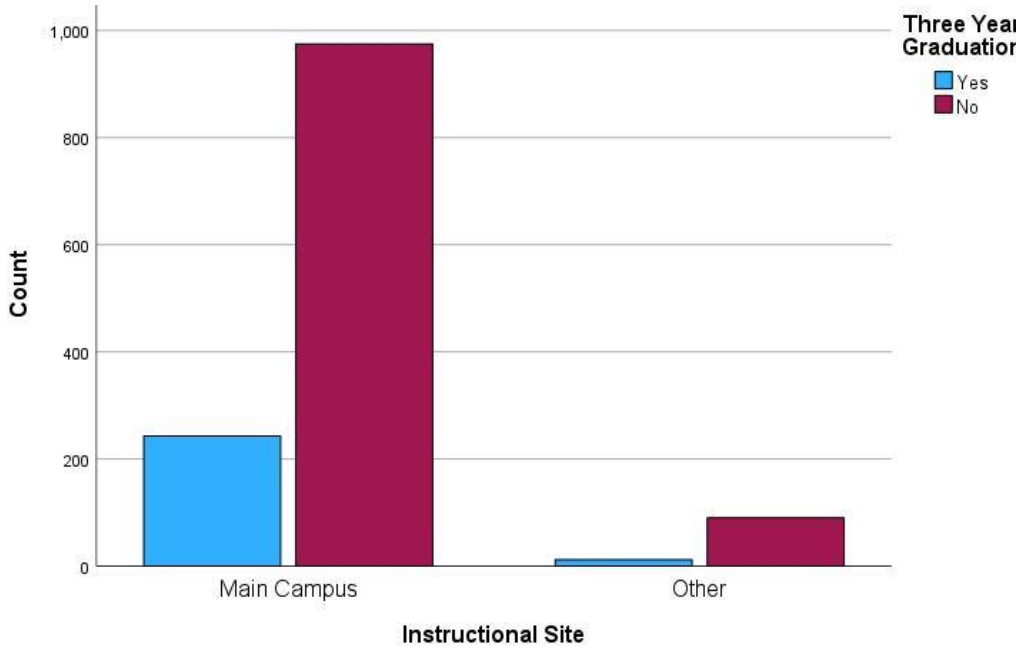
Is there a significant relationship between instructional site location (main campus or other) and three-year graduation for community college commuter students only taking in-person classes?

$H_0$15: There is not a significant relationship between instructional site location (main campus or other) and three-year graduation for community college commuter students only taking in-person classes.

A chi-square test of independence was conducted to evaluate the relationship between instructional site location and three-year graduation rates for community college commuter students only taking in-person classes. The two variables were instructional site location (main campus or other) and three-year graduation outcome (yes or no). Instructional site location and three-year graduation were found to be significantly related, Pearson $\chi^2(1, N = 1{,}320) = 4.05$, $p = .044$, Cramer's $V = .055$. Therefore, the null hypothesis was rejected. The results indicate that location of instruction shares significant relationships with three-year graduation rates. Students attending the main campus were significantly more likely to graduate within three years than students commuting to an instructional site location other than the main campus. Figure 13 shows the breakdown of three-year graduation rates by instructional site.

Figure 13

Three-year Graduation Outcomes Compared by Instructional Site Location



Chapter 5. Summary, Conclusions, and Recommendations

The purpose of this non-experimental, quantitative correlational study was to investigate whether the distance that community college students must travel to their college classes has a significant relationship to retention and other student success metrics (GPA, enrollment status, credits attempted and earned, graduation outcome). All student data for this study were archival, provided by the participating community college's Office of Institutional Effectiveness, Research, and Planning. As the focal point of this study was commute distance, students' residential ZIP codes were utilized as the origin to calculate the distance between home and the site of instruction. The dataset included first-time, freshmen community college students attending a public community college in the southeastern United States. The participating college included four instructional sites that students could have attended. Only students attending all in-person classes were included in this study to maintain consistency in commute distance impact. Findings from this study add to the body of knowledge regarding community college commute distance impact and trends related to student retention, as well as other success metrics. These findings may also assist institutions in their strategic approaches to improving student retention and success for commuter students.

Summary of Findings

One-way student commute distance (in miles) from students' home ZIP code to address of instructional site was utilized as the independent variable in Research Questions 1-8 and 10-14. Distance was analyzed with each question's dependent variable using a chi-square test of independence or one-way analysis of variance (ANOVA) as appropriate. Research Question 9 involved comparing first semester GPA to overall GPA. Research Question 15 compared three-year graduation rates among instructional site locations and was analyzed with a chi-square test.

Research Question 1 compared freshman to sophomore retention at the participating institution to the student commute distance groups. While the upper two distance ranges (46-60 miles and 61+ miles) had the lowest retention rates, the chi-square test of independence found no significant differences in retention from freshman to sophomore year based on commute distance. Students with the shortest commutes had approximately the same likelihood of returning to college their sophomore year as did their peers who had to commute significantly further.

Overall college GPA was analyzed in Research Question 2 for each of the subjects, and compared to commute distance through ANOVA. The average final GPA across all commute distances was 1.98. This included all students in the study, regardless of graduation outcome. The data analysis detected a small relationship between distance and overall GPA. The lack of significance indicated that a student's overall GPA was not related to commute distance.

Research Question 3 reviewed the relationship between student enrollment statuses, full-time or part-time enrollment, and one-way commute distance. Results did not indicate any relationship between commute distance and enrollment status. Each commute group was evenly distributed with approximately the same proportion of students (90%) enrolling full-time in college. While these are high percentages of full-time enrollment, each distance group shared the same high percentages of full-time enrollment.

Research Question 4 dealt with student success outcomes by comparing three-year graduation outcomes among the commute distances of students. The analysis did not indicate any significant relationships between commute distance and graduation rate. The mean three-year graduation rate for the study sample was 19%.

Credit hours attempted and completed during the students' first semester were analyzed in Research Questions 5 and 6 respectively. Chi-square results indicated significant findings for both questions. In Research Question 5, a positive relationship was found when analyzing student commute distance and credit hours attempted during first semester. Students who commuted longer distances tended to take more credit hours per semester when compared to their peers driving in the shortest distance categories of 0-15 miles and 16-30 miles. Results for Research Question 6 followed the trend of significance found between commute distances and credits attempted, showing that students in the longest commute distance category (61+ miles) were significantly more likely to complete 13-18 credits hours in their first semester when compared to their peers commuting other distances. Conversely, the only commute distance to have student completion of 19+ credit hours during the first semester was the shortest commute distance group of 0-15 miles.

Research Questions 7 and 8 covered overall credits attempted and completed, respectively, compared to student commute distance. The mean for credits attempted overall (M = 48 credit hours) remained steady across all commute distance groups and did not yield any significant differences. Similarly, the one-way analysis of variance in Research Question 8 did not indicate any significant findings among commute distances and overall credits completed. Both credits attempted and completed shared only a small relationship with the factor variable of commute distance.

First semester GPA was compared to overall GPA for commuter students in Research Question 9. A Pearson correlation coefficient identified a significant difference between the two variables. Overall GPA was found to be significantly lower than first semester GPA for the students in this study, all of whom were commuting to and from their college classes.

Research Questions 10-12 focused on student demographics (age, gender, and ethnicity) compared to commute distance. Student age upon enrollment did not significantly differ among commute distance ranges. The mean age for the study sample was 19 years old. Students' age did not appear to be a factor in the one-way commute distance that a student made to attend their classes. Gender, analyzed in Research Question 11, also showed no significant relationship with commute distance for first-time community college freshmen. The distribution of males and females across the commute distance group was normal and as expected. Males and females did not have an increased presence or absence in any of the commute ranges. Research Question 12 contained the only significant demographic variable in the study. For this question, student ethnicity was analyzed and compared to student commute distance using a chi-square test of independence. A positive correlation was found among Black and Hispanic students commuting 0-15 miles; a negative correlation was identified between Black students and the longer commute groups of 31-45 and 46-60 miles. Additionally, White students were found to be significant majorities in the upper distance range groups of 16-30 miles and 31-45 miles.

Research Question 13 involved analysis of students' weekly class schedules, or days per week attending class, compared among commute distance. The average number of days per week for each student (M = 4) was consistent among each of the commute distance groups. However, students commuting in the 61+ mile group were significantly more likely to be attending class five days per week compared to all other commute groups. The distance a student commuted to their college classes appeared to be related to the number of days they scheduled for class each week for those in the longest commute distance group.

Degree of study was compared to student commute distance in Research Question 14. The participating college in this study offered degrees of Associate of Arts, Associate of Science,

and Associate of Applied Science. When analyzing students' chosen degree of study among commute distances, there were no statistically significant relationships. The distance first-time community college students traveled did not appear to affect their degree selection. The students in each commute distance level were approximately distributed in the same degree patterns. The Associate of Science degree was the most common degree of study across the entire sample, regardless of commute distance. Associate of Applied Science was the second most common degree, followed by the Associate of Arts degree.

Research Question 15 compared three-year graduation rates among instructional site locations to identify if any significant relationships existed between students attending the college's main campus or other satellite locations. The chi-square test conducted for this sample revealed a significant correlation between instructional site attendance and three-year graduation rate. Students who attended all of their classes in-person at the participating institution's main campus were significantly more likely to graduate college within three years when compared to students attending at a satellite location.

Conclusions

The lack of significant relationships found in this study between community college student commute distance and the tested variables indicates that commuting may be less impactful on student success than previously believed. Data analyses conducted on the relationship of one-way student commute distance among several student success metrics (freshman to sophomore retention, overall GPA, and three-year graduation) did not yield any statistically significant correlations. These findings do not support previous conclusions from Nelson et al. (2016) who found a negative relationship between most commute distances and GPA, and a positive relationship for extreme commute distances (those in the top 1%). It should

be noted that their study only included four-year college students and did not take into consideration any online course enrollment. Results from this study, focused on community college students attending only in-person classes, do not support any relationship, positive or negative, between commute distance and retention (or overall GPA or three-year graduation). Similarly, student demographics such as age and gender analyzed for this study did not share any significance when compared to commute distance.

There were some significant findings that resulted from this study's analysis of variables. When credit hours attempted and completed during the students' first semester were analyzed across commute distance groups, significant relationships were found for both test variables. Research has indicated that college credit attempts during a college student's first year have a positive relationship with overall student success measured through graduation (Attewell & Monaghan, 2016). This study's findings link increased commute distances with increased likelihoods of more credit completion during the first semester of enrollment. Studies related to early academic momentum, focused on increased credit attempts during the students' first year, have shown increased likelihoods of community college completion, transfer to four-year institutions, and baccalaureate graduation (Doyle, 2011; Zhang, 2022). This study provides further knowledge to that subject area with an increased focus on community college and commuter students, which are both historically underrepresented in research.

Analysis between students' first semester GPA and overall, final GPA yielded a significant, positive correlation between the two variables. This indicates that as community college commuter students progress through their higher education journey, they are significantly less likely to earn high overall GPAs, if their first semester GPA was low. While this finding was statistically significant, the study found no correlation between GPA and commute distance. The

results of lower overall GPAs being positively correlated to lower first semester GPAs can be explained by the progression of challenging coursework that students take as they advance through their respective academic programs. If students struggle to succeed with lower-level coursework, they will likely also struggle with more advanced courses. Students who are retained will end up taking significantly more credits during their tenue, which will additionally affect their overall GPA.

Ethnicity was found to have a significant relationship with student commute distance. Minority students (Black and Hispanic) were significantly more likely to commute in the 0-15 mile range, and less likely to commute longer distances when compared to their peers in other ethnic groups. Black students had particularly decreased representation in the longer commute groups of 31-45 miles and 46-60 miles. Conversely, White students were significantly more likely than other ethnicities to be represented in these longer commute distance groups. These findings indicate that additional research may be needed for this particular topic and relationship.

While this study found that student commute distance was not a key indicator of student retention and other success metrics, the findings related to instructional site attendance and graduation rate were significant. Analysis of these variables found that students who did not attend the main campus instructional location were significantly less likely to graduate within three years when compared to their peers attending a satellite location. This finding is particularly important for the topic of rural college accessibility and success. Limited student support, engagement, and related resources at non-main campus locations may play a role in this finding.

Recommendations for Practice

Institutions of higher education can take these findings to further develop and improve their academic resources and support for commuter students, specifically those at the community college level. Additionally, results may also provide greater insight into student persistence, as it relates to commute distances and how institutions may work with that knowledge to increase retention and success.

Based upon this study's findings, the following recommendations for practice are suggested:

1. Increase advising and support services to all commuter students, with an emphasis on understanding the importance of taking 12 or more credit hours per semester. This study showed that students commuting longer distances were more likely to attempt and complete higher numbers of credits during their first semester. Students living closer to the location of their classes attempted and completed significantly lower credits during this important time of their educational journey. Previous research shows correlations between first year credits attempted and long-term success and completion outcomes.
2. Provide more outreach and education to minority students who live outside of the average commute range. Results from this study indicate that minority students were not as likely to enroll and attend in-person classes if their one-way commute distance was over 30 miles. Additional recruitment and support efforts for these negatively impacted demographics could boost the success of diversity, equity, and inclusion efforts.

Recommendations for Further Research

From economic and workforce development perspectives, community colleges can have a vast and influential impact in strengthening the communities and citizens they serve. Their role in skilling up the workforce and providing meaningful career pathways through a myriad of pipelines – youth through dual enrollment, adults through traditional course offerings, and incumbent workers through workforce development trainings – creates a unique role and importance for increased research into the impact and potential need for increased locations, with increased student support, throughout rural America. Instructional site location for students was a significant finding for this study. Three-year graduation rates analyzed with location of students' in-person classes showed a significantly negative correlation between satellite campus attendance and graduation completion within three years of first attendance. While commute distance did not have a significant impact on graduation, the location of classes (main campus versus any other location) did have a significant result on graduation outcomes. Institutions and policy makers could benefit from further analyzing this relationship to identify any factors that may be contributing to this inequality. As this study shows that satellite locations, which are oftentimes in rural areas, are less likely to produce graduating students compared to their main campus counterparts, this is an area for much needed research.

While online course delivery may appear to be a likely solution to the issues of higher education access and student success, especially in rural areas, it is not a simple solution. There are many outcome inequities endemic to online learning that strengthens the need for in-person alternatives. Further research should therefore keep this in mind when addressing distance-related education issues with online solutions.

As this study only included community college students attending all in-person classes, Research Question 3 indicates that students who attend only in-person classes may be more likely to enroll in college full-time. Further research into this topic could further develop student retention and success efforts.

Further research could be beneficial in analyzing student commute trends and their association with ethnicity. This study's findings related to the significant differences in commute distance among minority groups is worth further analysis to identify any possible inequities in college accessibility.

While most of the service area, in terms of landmass, for this study's southeastern United States community college does not have a public transit system, a large portion of the student population near the college's main campus is located along a public mass transportation system route. Just as the community college in Clay and Valentine's 2021 research, this study's participating institution provides its students public bus passes that are included in student tuition. While this is a great practice to benefit students along public transit routes, this only covers a small percentage of any college's overall student population. This study did not take into account the method of commute that the students utilized to cover the distance from home to school. The higher education community could benefit from additional research into commute method types to identify any possibly significant relationships in that area.

Additional recommendations for further research include:

1. Further examine the relationship among credits attempted, earned, and success outcomes for community college commuter students. This study along with previous studies indicates a relationship that would be beneficial to understand in further detail. Based upon additional support of these relationships, institutions would then

be better equipped to advise and support students to have the greatest likelihood for ultimate success.

2. Investigate ethnic and racial inequalities that may exist in enrollment and commute metrics. The results from this study point to significant differences in ethnic distribution across commute distance groups. The academic community would benefit from further understanding of this topic and potential solutions.
3. Evaluate large-scale research on the role that instructional site location may have on student success, specifically between main campus locations and satellite locations across the community college system. If students attending locations other than their institution's main campus are less likely to graduate, as this study indicates, then the academic community should work towards understanding the contributing factors to this issue. Identification of these variables could lead to increased retention and success across all college instructional sites, while providing a more concrete understanding of the role and impact of community college commuting.

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