Food for Thought: Exploring the Relationship between Food and Housing Insecurity and Academic Performance Among Nontraditional Students enrolled at Public HBCUs in North Carolina

by

Jerisha V. Farrer

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Approved by

Dr. Jonathan Taylor, Chair, Associate Professor, Department of Education, Foundations, Leadership and Technology, Adult Education, Auburn University
Dr. Leslie A. Cordie, Associate Professor, Department of Education, Foundations, Leadership and Technology, Adult Education, Auburn University
Dr. Sheena Stewart, Director, Professional Development, Graduate School, Auburn University
Dr. Andrew Pendola, Assistant Professor, Department of Education, Foundations, Leadership and Technology, Educational Research, Measurement, and Assessment, Auburn, University
Dr. Geleana D. Alston, Interim Department Chair and Full Professor, Leadership Studies &Adult Education, North Carolina Agricultural and Technical State University

Abstract

Due to mild or severe economic equality, populations of nontraditional students have been shown to be particularly susceptible to food and housing insecurity. The current research is largely lacking literature examining these experiences of nontraditional students at public NC HBCU. The present study will explore the relationship of food and housing vulnerabilities that may be barriers to academic success and performance for students who attend a public HBCU in N.C. The results of a survey of students (n=42) indicated that there is a significance of the students having experienced some level of food and housing insecurity. The sample size for this study is a limitation, which may impact the generalizability of the findings. The study concludes with recommendations for future research exploring additional factors affecting risk-taking within the realm of basic needs insecurity and how it impacts student success at HBCUs.

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Table of Contents

List of Tables

List of Figures

Appendices

List of Abbreviations

HBCU	Historically Black College(s) and university
ECSU	Elizabeth City State University
F.I.	Food Insecurity
FSU	Fayetteville State University
H.I.	Housing Insecurity
NC	North Carolina
NCAT	North Carolina Agricultural and Technical State University
NCCU	North Carolina Central University
PWI	Predominately White Institution
SES	Socio-Economic Status
UNC System	University of North Carolina System
USDA	United State Department of Agriculture
WSSU	Winston-Salem State University

Chapter I

Introduction

Poverty and homelessness affect many people in the general population of the United States (Silva et al., 2017). The National Alliance to End Homelessness (2015) found that more than 578,000 people were living in the United States experience homelessness on a given night. According to Arnett (2000), those who identified as younger in age were particularly susceptible to housing insecurity (H.I.), homelessness, or poverty. Specifically, emerging adults (18-24 years old) are considered the most vulnerable. Approximately 4.6% of individuals in the age range 18-28 have experienced an episode of homelessness (Shelton et. al., 2009). Silva et. al (2017) describes how there is not a set federal definition of homeless youth (Toro, Dworsky, &Fowler, 2007), but defines H.I. by using the McKinney-Vento Homeless Assistance Act, Subtitle VII-B, as the lack of a fixed, regular, and adequate nighttime residence or sharing housing with others because of the loss of previous shelter (Wong, Elliott, Reed, & Ross, 2009). According to Silva et al. (2017), emerging adults who experience an episode of homelessness or chronic poverty resulting in H.I. are often still able to attend college and work toward earning a degree. Though federal legislation is enacted to support students through high school graduation, limited protections are enacted for students attending post-secondary institutions (Hallett, 2010).

Food insecurity (F.I.) is a problem that affects vulnerable populations around the world. When thinking about vulnerable populations, one may think first of impoverished children and families, displaced persons, or the elderly. However, many college students are also part of this vulnerable group. The U.S. Department of Agriculture (USDA) defines food insecurity as the “household-level economic and social condition of limited or uncertain access to adequate food,” which can lead to hunger, defined as an “individual-level physiological condition as a result of food insecurity” (USDA, 2016). According to Camelo (2017), “Food insecurity may lead to physical health issues that present themselves in the form of nutritional deficiencies, fatigue, stress, weight loss or gain and lack of focus. These health issues may be barriers to achieving what should be most important while in college, specifically in academic performance.” The literature suggests that food insecurity is tied to a student's socioeconomic status (SES). This study explores the relationship of food insecurity as a mediator for GPA and the following student characteristics: race/ethnicity, Pell Grant status, first-generation college student status, being employed, and living on-vs. Off-campus.

In response to poor economic conditions and subsequent state budget cuts universities and colleges have annually increased tuition (Hemelt & Marcotte, 2011). Despite universities and colleges facing growing fiscal pressures by increasing the costs to attend their institutions, there is also a rise in nontraditional students experiencing H.I., food insecurity (F.I.), and poverty to attend college (Toro et al., 2007). For example, when the City University of New York (CUNY) system conducted a comprehensive assessment of housing among college students. The study concluded that approximately 1% of students lived in a shelter, 11% lived in public housing, and 6% received a rental supplement (Tsui et al., 2011). Also, results showed that during the 2013–2014 academic year, 56,224 students self-identified as being homeless on the Free Application for Federal Student Aid (B. Duffield, personal communication, November 5, 2015). Emerging research indicated that housing and food vulnerabilities may be barriers to academic success.

Food and Housing Insecurity & Education

The American dream consists of attaining an education that is by far the most important characteristic for predicting earnings (Julian, 2012). According to U.S. Census Data, each educational milestone completing some high school, earning a high school diploma, completing some college, earning an associate or bachelor's degree parallels with a higher average yearly salary (Julian & Kominski, 2011). It is ingrained in our society that education is a vital tool to help people avoid some of the causes of food and housing instability, such as a job loss or an inflated cost of living. If we can help those who fall into food or home insecurity due to economics, this is an indication to increase their educational levels. It follows that they may be better able to regain economic stability.

Nontraditional Students and College

Nontraditional college students are defined in three ways: students over the age of 23 (or 25), students with backgrounds such being a first-generation college student, all the while considering the factors that may cause a student to stop or drop out due to role-conflicts within their community or households. (Clark, 2012; Gilardi & Guglielmetti, 2011; Kim, Sax, Lee, & Hagedorn, 2010; Philibert, 2005). Also, nontraditional college students are the fastest-growing group of students attending college (Gilardi & Guglielmetti, 2011; Wyatt, 2011). Studies on nontraditional college students have shown that they are often at higher risk of not completing their post-secondary education because of life pressures and social backgrounds, yet they have also been found to be more intrinsically motivated than traditional college students (Shillingford & Karlin, 2013; Taylor & House, 2010; Wyatt, 2011).

According to Broton & Cady (2020) nationally, three-quarters of today's undergraduates are "nontraditional" or "new-traditional" students. Broton & Cady (2020) explain that these demographics of students do not fit into the stereotype of a young adult who decided to attend college full time immediately after high school. Approximately two-thirds of undergraduates work while enrolled in college, one- quarter are student parents, half are financially independent according to the financial aid system, nearly half attend school part time, and one-third delayed college enrollment by a year or more (Broton &Cady, 2020; U.S. Government Accountability Office, 2019). According to the US GAO, 14 percent of students live on campus while enrolled in college (2019). Broton & Cady (2020) then support this claim by explaining that student lives are much more complex than idealized notions of college as protected time for emergent adulthood (pg. 15). Broton & Cady (2020) then explain how over the past three decades, the price of college has increased while the purchasing power of financial aid has not kept pace (pg. 19). According to the Global Food Initiative (2019), just one estimate of the average annual price of college--- including fees and tuition, room and board, books and supplies, transportation and other expenses for in-state students is nearly $18,000 at a public two year and more than $25,000 at a public four-year college and university. According to Broton & Cady (2020), prior to generations, college students today are more than likely to have a job and work longer hours than their peers who are considered traditional students (pg. 16). Unlike prior generations, 21st-century students cannot work their way through college with a combination of summer and part-time employment (Broton & Cady, 2020). Broton & Cady (2020) report that student employment has shifted into minimum wage jobs, including the services industries that pay the minimum wage and lack consistent or secure work schedules. Due to minimum wage losing its purchasing power to the power of inflation students who come from households considered low- and middle-class families have demonstrated economic stagnation since 2000, while upper class families are earning more, widening the income inequality in the United States (Broton & Cady, 2020). The University of California Global Food Initiative (Broton & Cady, 2020; University of California Global Food Initiative, 2017) reported that one-third of the adults in the United States lived in low-income households that have a median annual income of $25,000 a year for a three-person household, and even more live-in moderate-income households that struggle to make ends meet, yet they are not eligible for most public support (p. 16). With the income inequality gap increasing and wages staying stagnant in conjunction with the price of college increasing, this means nontraditional students and their families would contribute a larger share of family income towards paying for college and increasing their chances of facing F.I. and H.I. Though research shows that additional financial resources and aid improve degree attainment for students from low-income households, the current financial aid system does not promise these specific students financial security.

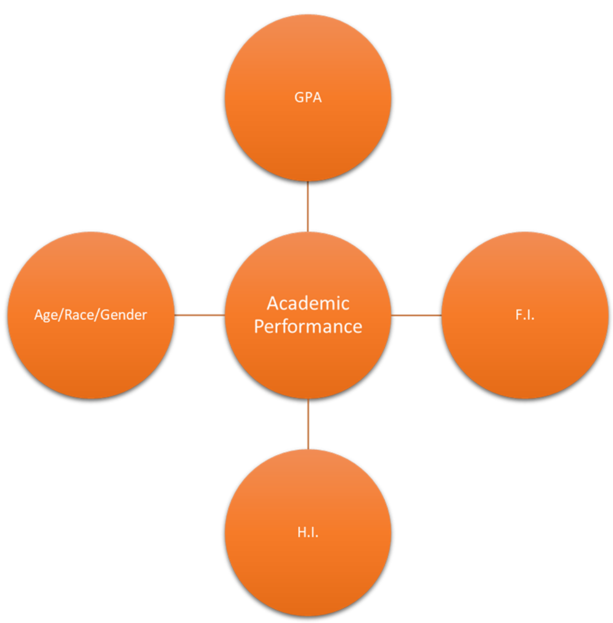
Statement of Problem

When it comes to education, critical theorists such as Paolo Freire (2000) and Henry Giroux (2008) have called for more attention to be given to the education of those who do not have the social, economic, and political power in a society. One could argue that one of the most underserved student demographics in American higher education is the nontraditional traditional student. There have been some efforts amongst nontraditional student populations to advocate for change and some have been successful, such as securing the right to vote, and access to resources to increase their stages of actualization while on campus (Lee et al., 2010).

Purpose of Study

This study aims to (a) explore the relationship of food and housing insecurity among nontraditional students, (b) study the effects of food and housing insecurity on nontraditional students' academic performance. More specifically, this study tests whether food and housing insecurity is greater, and GPA is lower, among students who are African American, Asian, Hispanic, Indigenous/Native American, or White, who receive the Pell Grant, utilize food pantries or other resources to combat F.I. and H.I., who are first-generation, low SES. In addition, the study will seek to find who were working relatively more hours for pay at the time of the survey, and who live off-campus vs. on-campus. Subsequently, it will examine the relationship of co-curricular experience and food and housing insecurity that explains, in part, why some student groups are at higher risk of low GPA and low co-curricular involvement than others.

Figure 1: Concept Model



Research Questions

1. To what degree do nontraditional students at public HBCUs in North Carolina report experiences of F.I. and H.I.?
2. Is there a significant relationship based on nontraditional student demographics (age, gender, race) and experiences of F.I. and H.I. at public HBCUs in North Carolina?
3. Is there a significant relationship between cumulative GPA earned and F.I. & H.I.?
4. Is there a correlation between participation in co-curricular activities and experiencing F.I. and H.I. for nontraditional students at public HBCUs in North Carolina?

The following three variables were examined via a self-report survey: housing stability, food security, and academic performance through co-curricular experience. Descriptive statistics and t-tests were conducted to assess the presented level of needs and examine the relationships between the identified variables and demographics.

Hypothesis:

Hypothesis 1: Nontraditional will report experiences of F.I. and H.I. at public HBCUs in North Carolina.

Hypothesis 2: There will be a significant relationship based on nontraditional student demographics (age, gender, race) and experiences of F.I. and H.I. at public HBCUs in North Carolina

Hypothesis 3: There will be a significant relationship between cumulative GPA and F.I. & H.I. of nontraditional students at public HBCUs in North Carolina.

Hypothesis 4: There will be an inverse correlation between participation in co-curricular activities and experiencing F.I. and H.I. for nontraditional students at public HBCUs in North Carolina.

Definitions, Assumptions, Limitation, Delimitations:

Throughout this dissertation, some key terms will be used. Following are some definitions:

1. **Food Insecurity**: As stated in the Introduction, the USDA (2016) defines food insecurity as the "household-level economic and social condition of limited or uncertain access to adequate food," which can lead to hunger, defined as an "individual-level physiological condition as a result of food insecurity".

2. **Housing Insecurity**: As stated in the Introduction, describes, and defines the lack of or inadequate stability of shelter due to high living cost in relation to one's income, poor and unstable qualities of neighborhood(s), overcrowding of home. This definition does not include homelessness. In this study, participants self-identified as housing insecure will have a personal definition for each participant. All participants fit within the categories of couch surfing (staying with friends), living in a car, hotel, extended stay or taking up a residence at a designated address that is deemed gentrified and overcrowded.

3. **Nontraditional Student**: For the purposes of this study, a Nontraditional student will be defined as anyone 19 years old or older who is/was taking at least one class for credit at an public HBCU or Tribal College in North Carolina.

The first assumption of this study is that nontraditional students' experience is different from that of traditional college students and thereby worthy of investigation. Next, quantitative research methods will detail the experiences of understudied groups. Finally, an increased understanding of the experiences of nontraditional college students who are F.I. and H.I. is an important step in making sure this population is appropriately and adequately supported at their institutions. This study was limited to the five public HBCUs and one public Tribal College located in NC., but this research cannot be generalized beyond the experiences of the participants in the study. Participants were found through their institution electronic and digital communication on campuses. Also, most of the participants chose not to utilize the shelter system and many other services; therefore, it is possible that the nontraditional students at these specific universities who do utilize those services may have different experiences than those captured among those who did not utilize the services and resources on campuses.

Moreover, many of the participants attended 4-year public HBCUs and Tribal Colleges, which means this study may not represent the experience of F.I. and H.I. college students at community colleges, junior colleges or PWIs. Finally, this study focus was the experiences of F.I. and H.I. college students enrolled at public HBCUs in NC; thus, it may not apply to other institutions, populations and/or other settings. For example, F.I. and H.I. nontraditional students enrolled in private HBCUs, community college, junior colleges or PWIs may have a different experience than F.I. and H.I. nontraditional students enrolled at public HBCUs in NC. Therefore, this research will only provide insight into this population and participant group.

This study intended to gain more information regarding the student vulnerabilities that could be barriers to academic success within urban, rural, and public universities that are considered HBCUs and Tribal Colleges, particularly those on F.I. and H.I. Although the study provided data regarding multiple student bodies, there were also limitations. One limitation was that this study was conducted primarily at universities in N.C. that are designated as public

HBCUs and Tribal Colleges. While these findings reflect the needs of this study body, they may not reflect other HBCUs and Tribal Colleges in suburban, rural, or other campuses across the country that provide resources to combat F.I. and H.I., making it difficult to generalize the findings. A second limitation is that students were randomly selected, a selection bias may have been introduced by the faculty staff and administration willing to allow the research team to distribute surveys. This is because the sample may have consisted of support services and resources where the faculty, staff and administration addressed housing and food insecurity issues in the past. The third limitation is that although participants were given the same survey, they may have reported incorrect responses due to fear of having their answers seen by peers or administrators. Finally, as with any self-report data collection procedure, the information regarding academic performance was based on the students' perceptions and reports. One delimitation to this study would be the geographical locations due to these schools being located across the state of North Carolina. The second delimitation of this study is the sample size. The study aims to reach out to six (6) institutions to survey participants that may be below the anticipated 300. Lastly, the third delimitation is that the methodology of the study is quantitative and not qualitative. This method does not capture the experience but the predictors of the barriers of what nontraditional students at four years universities or colleges that are federally designated as an HBCU and Tribal College.

Significance of Study

Both the quantitative and qualitative data on nontraditional students that attend 4-year institutions that experience F.I. and H.I. is minimal. Since so little is known about this experience, it is crucial to begin to understand the trend to be sure that interventions and services that target this population are needed and wanted. Nontraditional college students tend to be an invisible population; in fact, I was a nontraditional student enrolled in an HBCU that has experienced F.I. and H.I. This research study brings these students and their stories into the forefront, and it will help faculty, university administrators, and policymakers better understand the experiences of this population. This study will demonstrate from a quantitative lens to understand the factors of food and housing insecurity among nontraditional students attending a public HBCU in North Carolina. This study will also assess the barriers and how it affects nontraditional students' academic performance. The purpose of this study is to inform HBCUs on how to shape and implement high impact practices in future initiatives and services that are targeted to this population. Finally, this study adds to the minimal but growing literature about these students and expands areas that need future study that specifically focused on institutions federally designated as HBCUs, Tribal Colleges, and other Minority Serving Institutions.

Overview of the Following Chapters

In chapter II, a review of the pertinent literature framing the topic is presented. Chapter III outlines the methods used to conduct the research project and to analyze the data collected. Chapter IV presents the results of this analysis. Finally, Chapter V provides a detailed discussion of the findings and their connections to research and theory and implications for further research and practice.

Chapter II: Literature Review

Seeking and earning a postsecondary degree is one of the few ways for upward mobility for students from low- socioeconomic backgrounds (Broton & Goldrick-Rab, 2017; King, 2017). However, the financial strain associated with the cost of higher education may lead students to make difficult decisions related to spending on food and housing. As the price of tuition continues to rise, college students are increasingly relying on loans, working multiple jobs, and sacrificing basic needs to offset the cost of pursuing higher education. These are adverse outcomes for college students who lack essential needs such as a bed and healthy food options. Research has found that these relationships between food and housing insecurity and student success and achievement (Camelo, 2017, Dudley 2017, Martinez et al., 2018; Phillips et al., 2018), behavioral issues (Alaimo et al., 2017; Jyoti et al.2005), and mental health (Bruening et al., 2016; Martinez et al.,2018; Patton-Lopez et al., 2014). However, there is a gap in research and recognition of student success practices regarding HBCUs to address the problem of F.I. and H.I on their respective college campuses.

According to Martinez et al. (2018), many factors may cause a student's inability to afford college. Not only is tuition steadily increasing, but there are also economic and social policies that exacerbate the issues of basic needs insecurity (F.I. and H.I.) for college students. For instance, state policies that enact declining support of state support for universities. This can cause an increase in costs that affects academic performance and performance. Martinez et al. (2018) describe how this affects the student in California due to the declining state support is a leading contributor to increasing costs for students enrolled at public universities. For example, the University of California system (2020) reports that in 1990 78% of the total cost of education per student was state funded compared with the 40% in the 2018-2019 fiscal year.

This chapter will provide a context of F.I. and H. I in adult education while defining and illustrating the nontraditional student experience through data. The impediment to economic, social, and cultural capital as a potential barrier or impact on nontraditional students who experience F.I. and H.I. will also be examined. This chapter concludes with a review of how adult education and learning uses the influences of Maslow's Hierarchy of Needs (1943) as the theoretical framework that guided this study to show relationship of academic performance and F.I. and H.I. among nontraditional students that are enrolled at public HBCUs in NC.

Using Adult Education to address basic needs

Malcolm Knowles (1984) suggests that one of the principles foundations of adult learning is problem centered. Suppose adult learners' needs are not being supported by the proper resources. In that case, this lessens their intrinsic motivation to learn subjects and utilize resources that immediately affect their personal and professional well-being. Knowles (1984) states that an adult learner's basis for learning becomes oriented within their routines and habits. When there is a shift or gap in their learning experience, the experience of lacking access to consistent nutritional food and adequate housing, their ability to learn and perform increasingly, all the while decreases developmental tasks of their social and academic roles. It is the responsibility of the adult educator to ensure that as the adult learner matures in their learning experience from being dependent to a self-directed learner, their basic needs are addressed through impactful practices through the increase of vital resources for the adult learner and others around them. To ensure that impactful practices are implemented, the adult educator must provide opportunities for the adult learner to plan and evaluate their learning experiences (Knowles, 1984).

Maslow Hierarchy of Needs

Abraham Maslow (1943, 1954) argues that there are five stages to the hierarchy of needs humans need to achieve. Some needs take precedence over others as their motivation increases but acknowledge that the overall goal is self-actualization. Though Maslow (1943, 1954) argues that humans most basic needs is for physical survival and that physical survival is the primary factor that motivates this overall person behavior, he does not demonstrate if a person is to revert to stage one (physiological needs) if they are to participate in new learning or living experience. Maslow (1943, 1954) explains that this will be a foundation and motivational factor to accomplish the following levels of need when the first stage is achieved. Maslow (1943, 1954) states that the first tier that is required to be achieved is "physiological needs." Maslow (1943, 1954) defines "physiological needs" as the physical requirements for humans to survive. For example, an individual must acquire food, drink, shelter, clothing, warmth, sex, and sleep to achieve this initial stage. If this need is not met, the human body will not function. Maslow considers this stage of needs the most important as all other stages become secondary. However, Maslow (1987) then proposed that the five-stage hierarchy is not nearly as rigid as he described in his earlier work (pg. 68). In his reflections, Maslow (1987) discusses that these needs can be flexible based on external factors and individual differences. For example, for some individuals, the need to achieve self-esteem could be more important than the need for love. For others, the need for a sense of belonging may surpass even the most basic need. Maslow (1987) also noted that most behavior to achieve these needs can be multi- motivated and that "any behavior tends to be determined by several or all of the basic needs simultaneously rather than by only one of them" (p. 71). Maslow's (1962) hierarchy of needs theory has contributed to Adult Education and Learning. Rather than reducing behavior to a response in the environment, Maslow (1970a) adopts a holistic approach to education and learning. Maslow's approach encompasses the complete physical, emotional, social, and intellectual qualities of an individual and impacts of the adult learner experience inside and outside the classroom.

Educational applications of Maslow's (1962, 1970a) hierarchy theory to the work of the classroom teacher are apparent. Before a student's cognitive needs can be met, they must first fulfill their basic physiological needs. For example, a tired and hungry adult learner will find it difficult to focus on learning. Adult learners need to feel emotionally and physically safe and accepted within their learning environment to progress and reach their full academic potential. Maslow (1962, 1970a) suggests students must be shown that they are valued and respected in the classroom, and the adult educator should create a supportive environment that reflects value and respect. Adult Learners who do not have access to psychological needs will demonstrate low intrinsic motivation (self-esteem), resulting in not progressing academically at an optimum rate until their needs are met. Though this application sounds easy in practice, Maslow's Hierarchy of Needs (1943, 1954, 1962,1970a) limitation is the methodology. Maslow (1943, 1954, 1962, 1970a) created the characteristics of self-actualization from a biographical analysis, which is a qualitative method. McLeod (2020) argues that there are numerous problems with this specific approach from an empirical approach.

Basic Needs Insecurity and Adult Cognition

Maroto (2013) used Gao et al. (2009), a quantitative study that focused on the relationship between food insecurity and cognitive functioning among Puerto Rican adults (n=

1,358) ages 45 to 75 living in Massachusetts. In this study, Gao et al. (2009) food security state was assessed using the USDA HFSSM 10- Item Question. Participants were classified as “food secure” or “food insecure” in the definition and accordance with USDA terms. The researchers found that 12.1% of their study participants were classified as food insecure (Gao et al., 2009; Maroto, 2013, pg. 27). With this classification, food insecurity was associated with lower cognitive functioning indicated by verbal memory tests, mini-mental status evaluation, and verbal fluency tests (Moroto, 2013, pg. 28). According to Maroto (2013), these tests were adjusted for various potential factors such as age, education, socioeconomic status, smoking, alcohol use, and health conditions (pg. 28). Maroto (2013, pg. 28) states that:

> The researchers conclude that “the difference in global cognitive scores between participants with very low food security and those with food security was equivalent to accelerating cognitive aging by 8 years” meaning that an adult of age 70 with very low food security displayed the cognitive ability of a 78-year-old (Gao et al., 2009, p. 1202).

The Gao et al. (2009) study is highly relevant to the present student of basic needs insecurity because it is still one of the few studies investigating the relationship between basic (food) insecurity and adult cognitive functioning. However, the limitation to this study is that the study took place in Massachusetts and not a four-year college setting that can be classified as an HBCU, TCU MSI, PBCC, or PBI. It should be noted that the Gao et al. (2009) study population was older than the typical adult learner population that the UNC system classifies as nontraditional students. Furthermore, per Merriam Webster (2022), cognition refers to one's ability to reason, think and remember is not reflected in the nontraditional student GPA. Someone with impaired cognition may have trouble completing academic work due to their physical and mental ability that typically require an average level of cognitive skill or function.

Gao et al.'s (2009) study can provide a possible premise for the relationship between academic performance and F.I. and H.I. in nontraditional students enrolled in public HBCUs in North Carolina.

Concerns of Maslow Hierarchy of Needs

McLeod (2020) argues that biographical analysis is a method that is subjective and that it could be based on the opinion of the researcher. This approach can lead to bias that could reduce the validity of any data obtained. In addition, Maslow's definition of self-actualization and how to increase adult learners' motivation in a learning environment cannot be blindly accepted as the final answer or remedy as an empirical approach to determine academic performance if the student experiences F.I. and H.I. Furthermore, the biographical analysis Maslow focused on was a biased sample of self-actualized adult learners. These adult learners' backgrounds consisted of highly educated white males (McLeod, 2020). Though there are small studies of Maslow (1970) on females, they only consist of a small proportion of his sample (McLeod, 2020). In conjunction, since these studies, societal norms and definitions of gender expression and identities, race, ethnicity, and class have expanded. This makes it challenging to generalize Maslow's (1943,1954,1962,1970a) theory to individuals who may identify as non-white, cis heterosexual but may also identify as LGBTQIA+, non-binary and non-gender conforming that intersects in lower socioeconomic classes, and races/ethnicities that contributes to their support and challenging learning environment. Another concern is Maslow's assumption that the lower need must be satisfied before a person can achieve their potential to reach the highest level of self-actualization. McLeod (2020) argues that this is not always the case, and therefore Maslow's Hierarchy of Needs does not have a set way of being achieved. McLeod (2020) states that through examining cultural and capital wealth where many people live in poverty, people are still capable of higher-order needs such as love and belongingness. However, according to Maslow (1943,1954.1962, 1970a), adult learners who have difficulty achieving fundamental physiological needs can meet higher growth needs. McLeod (2020) argues that many creatives such as Rembrandt and Van Gogh lived in poverty their entire lifetime and could be argued that they achieved self-actualization.

Tay and Diener (2011) tested Maslow's Theory by analyzing over 60,000 participants from 123 countries that represented every major region. The survey was conducted from 2005 to 2010. Tay and Diener (2011) report that:

> Respondents answered questions about six needs that closely resemble those in Maslow's model: essential needs (food, shelter); safety; social needs (love, support); respect; mastery; and autonomy. They also rated their well-being across three discrete measures: life evaluation (a person's view of his or her life as a whole), positive feelings (day-to-day instances of joy or pleasure), and negative feelings (everyday experiences of sorrow, anger, or stress) (p. 356).

The study results support the view that universal human needs exist regardless of cultural differences and practices. However, when reading further into the findings, the ordering of the needs within the hierarchy was not correct. Tay and Diener (2011) explain that one does not need to fulfill them to get benefits—especially from others. For example, Tay and Diener (2011) explain that we can be happy with friends when we are hungry. Tay and Diener (2011) explain this as vitamins and how the needs work separately, but we still need them all in no specific order for them to be achieved.

Though this research focuses on need F.I. and H.I. at public four-year institutions designated as HBCUs or Tribal College in NC, Joyti et al. (2005) conducts a first-ever longitudinal cross-sectional study examining the effects of household F.I. at kindergarten-on-kindergarten subsequent selected dimensions of child development. For example, F.I. at kindergarten predicted impaired academic performance in reading and mathematics for girls and boys, a more significant decline in social skills for boys, and greater weight and BMI gains for girls. Food insecurity thus serves as an essential marker for identifying children with delayed trajectories of development. Joyti et al.'s (2005) second aim of their study then explores the relation of changes in F.I. over time with concurrent development using models that created their advantages. Joyti et al. (2005) state:

> Whether contrasted with children from persistently food-secure households (in the dynamic model) or households that became food secure (in either the dynamic or difference model), children from food-insecure households exhibited poorer reading performance, which was especially significant among girls. However, the magnitude of the difference was about one-fourth of the S.D. of the change from K to 3rd grade. Thus, there is evidence for a relatively short lag between food insecurity and its effects on reading for girls.

Joyti et al. (2005) explains how the latter mechanism, in which F.I. can act as a stressor. They also determined how support observed gender differences in the effects of H.I. Joyti et al. (2005) demonstrate how F.I. at the household level could affect girls and boys differentially at the individual level. However, the gaps in this study focused only on a specific demographic of students in grades K-3, where mental and physical developmental years were not as prominent in their decision-making. In addition, the study does not entail their housing stability concerning their food instability.

Silva et al.'s (2017) study contributes to a limited but emerging body of literature regarding F.I. and H.I. that college students face, particularly those in urban and metropolitan communities. Silva et al.'s (2017) study indicates that approximately one out of four students often worry about having enough money to buy food, are unable to eat balanced meals, or skip meals (p. 293). Silva et al. (2017) established that vulnerability regarding access to food is not unique. The F.I. rates ranging from 14% at the University of Alabama, 21% at the University of Hawaii at Manoa, 39% at Western Oregon University, 56% at two community colleges in Maryland, to 59% at CUNY (Chaparro et al., 2009; Freudenberg et al., 2011; Gaines et al., 2014; Maroto et al., 2015; Patton-Lopez et al., 2014; Silva et al., 2017). Silva et al. (2017) report that higher instances of H.I. were present among the participants in this study. Silva et al. (2017) also present that other studies have indicated that university students who have H.I. are particularly susceptible to difficulty attending classes or dropping out altogether (Alfano & Eduljee, 2013; Hallett, 2010). Silva et al. (2017) present in this study that the results indicated approximately 4% of students had precarious housing situations (e.g., not certain they could remain in their housing for the next two weeks) (p. 293). In addition, just more than five percent indicated having experienced homelessness at least once during their college career (p. 293). Although there is limited research available specifically addressing the college-level population regarding H.I., research currently demonstrates that school-age children who are experiencing F.I. and H.I. have higher rates of detrimental health concerns in comparison with children that have home stability, including hunger, asthma, stress, anxiety, and depression (Joyti et.al, 2005; National Center on Family Homelessness, 2011). Silva et al.’s (2017) intention of this study was to ensure that student vulnerabilities are barriers to academic success within an urban public university setting on F.I. and H.I. (p. 295). Though this study provided a copious amount of data about the correlation of F.I. and H.I., there were limitations to this study. The first limitation is that this study was conducted at an urban public university and not at multiple urban public universities. Though the needs reflected of the student body present at the study, this study may not reflect other universities located in suburban, rural, or regional campuses that provide housing accommodations to its student body (p. 295). Silva et al. (2017) explain that the second limitation is that while classes were randomly selected, a selection bias may have been introduced by the course instructors who were willing to allow the research team to distribute surveys. The third limitation explained how Silva et al. (2017) were given different survey forms (e.g., Form A and Form B), the possibility to report incorrect responses due to having their answers seen by peers.

Prevalence of food and housing insecurity

Many of the issues facing primary and secondary education are now part of the higher education landscape; food and housing insecurity are among them. In addition, F.I. and H.I. have always had a massive impact on community colleges students, especially during the COVID-19 pandemic. However, empirical data and work are nonexistent when discussing the impact of F.I. and H.I. at public HBCU's and Tribal Colleges. Though community colleges represent a far greater range of ages and identities than most four-year institutions, four-year HBCUs and Tribal Colleges share a unique community when serving adult learner communities. Currently, North Carolina is home to ten (10) four-year HBCUs and one Tribal College. Five HBCUs and one Tribal College are a part of the UNC- System and designated as public higher education institutions.

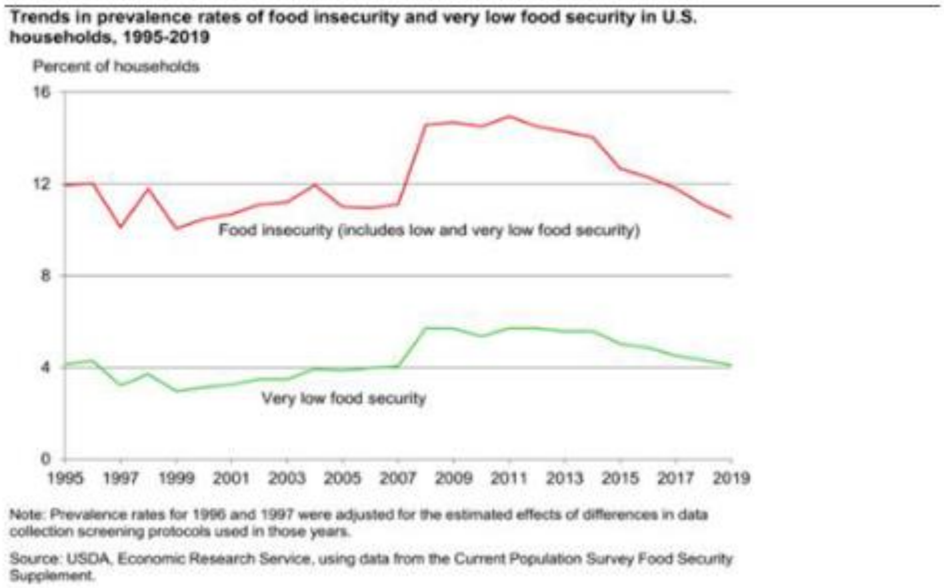
Over the last several decades, college enrollment rates increased, including among adults from low-income backgrounds. The idea of a "traditional" college student transitioning from their parent's home into a residence hall on campus to experience the transition to adulthood now constitutes a numerical minority (Deil-Amen, 2011). However, unlike in K-12, there is no systematic national effort to assess the extent of food and housing insecurity among undergraduates or cover the impacts of instability on college completion rates. Broton & Goldrick-Rab (2013) demonstrate that reason may be the persistent perception that housing insecurity is the equivalent of couch surfing seen in students' long-standing stereotypes. Also, food insecurity to college students not making the necessary and healthy option to eat. Broton & Goldrick-Rab (2013) counter that there are case studies of colleges investigating the housing situations of their students reveals a very different picture. Turner & Kingsley (2008) argue that it is difficult to get reliable information about the number or characteristics of those in need of food and housing assistance. MacArthur Foundation (2012) reports that the benefits of a safe and stable housing environment and access to food assistance are well documented. Food and housing stability can serve as a firm "platform" to launch positive social and economic outcomes, including education. Housing stability may be especially crucial during the transition to adulthood because of its relationship to the ability to pursue self-sufficiency goals related to postsecondary education or employment (Dworsky et al., 2012).

Breeden-Balaam (2019, 2021) states that in a post-pandemic survey by the Center for Community College Student Engagement conducted by Garcia et al. (2020), 67% of Black students expressed concern about having enough food for themselves or their families, compared with 60% of Hispanic or Latinx students and 44% of White students.

Prevalence rates of food insecurity varied considerably from State to State. Data for three years, 2017-19, were combined to provide more reliable statistics at the State level. During these three years, estimated prevalence rates of food insecurity ranged from 13.1 % in North Carolina (U.S. Department of Agriculture Economic Research Service, 2020). According to the USDA Economic Research Service (USDA ERS), this placed the state of North Carolina at the United States average of Food Insecurity. USDA ERS (2020) illustrates in Figure 2 a statistically significant (at the 90 percent confidence level) decline in the prevalence of food insecurity from 11.1 percent in 2018 to 10.5 percent in 2019. However, it demonstrates that this is the eighth year F.I. and H.I. were slightly declining from a high of 14.9 percent in 2011. #RealCollege conducted a survey led by researchers Sara Goldrick-Rab and Carrie S. Welton during the COVID-19 pandemic. Goldrick-Rab and Welton (2020) found that two in three students who were employed before the pandemic experienced job insecurity, with the other third losing their job due to the pandemic (2020). Goldrick-Rab and Welton (2020) also found that basic needs insecurity was higher among students who experienced job loss and cut to pay or hours.

USDA ERS (2020) reports that 2019 was the first-year food insecurity was statistically significantly below the 11.1 percent in 2007. In addition, year-to-year declines in food insecurity from 2014-to 2018 were also statistically significant. For example, the decline from 14.9 percent in 2011 to 14 percent in 2014 was statistically significant. In contrast, USDA ERS (2020) also reports that in the previous decade, food insecurity increased in 2001 from 10.7 percent in 2001 to 11.9 percent in 2004, declined to about 11 percent in 2005-07, then increased significantly in 2008 (to 14.6 percent), and remained the same in 2009 and 2010.

Figure 2.



Today, college students face the higher-than-ever cost of attendance (tuition and fees, room and board, books) (Ma et al., 2017). The state of N.C. has decreased its state support that uses a priority metric system to determine affordability and efficiency for its state-supported universities is the main contributor to the increasing cost of attendance in North Carolina (UNC System, 2021). However, the UNC System has created pilot programs and initiatives such as the "Fixed Tuition Program" (Flat Tuition Rates) and "N.C. Promise" at certain institutions in the system projected to create more affordable and efficient towards student success. According to the UNC System (2021), The Fixed Tuition Program, established by North Carolina General Statute 116-143.9, provides all in-state undergraduates an opportunity to complete a degree under the means of affordability at any institution in the UNC System. Once the in-state residents enter as a first-year student at any UNC System institution, tuition rates will increase for four years or eight consecutive semesters of enrollment. Students who remain continuously enrolled at a UNC System institution through fall and spring semesters will not see an increase in their tuition throughout their four-year baccalaureate degree program. The Fixed Tuition Program Students are not required to be enrolled during the summer term(s) to maintain continuous enrollment. However, students who leave an institution for a semester or more may be subject to tuition increases when they return. The provision includes flexibility regarding the eight-semester limit for those students enrolled in five-year programs (UNC System, 2021).

Nontraditional Students.

Nontraditional college students are defined in three ways: students over the age of 23, students with backgrounds such being a first-generation college student, and students who must consider the factors that may cause them to stop or drop out due to role conflicts within their community or households (Clark, 2012; Gilardi & Guglielmetti, 2011; Kim, Sax, Lee, & Hagedorn, 2010; Philibert, 2005). Also, nontraditional college students are the fastest-growing students attending college (Gilardi & Guglielmetti, 2011; Wyatt, 2011). According to Broton & Cady (2020), prior to generations, college students today were more than likely to have a job and work longer hours than their peers, who are considered traditional students (pg. 16). Unlike prior generations, 21st-century students cannot work their way through college with a combination of summer and part-time employment (Broton & Cady, 2020). One could argue that minimum wage has not lost its purchasing power to the power of inflation students. However, nontraditional students from households considered low- and middle-class families have demonstrated economic stagnation since 2000, while upper-class families are earning more, widening the income inequality in the United States (Broton & Cady, 2020). The University of California Global Food Initiative (Broton & Cady, 2020; University of California Global Food Initiative, 2017) reported that one-third of the adults in the United States lived in low-income households that have a median annual income of $25,000 a year for a three-person household, and even more live-in moderate-income households that struggle to make ends meet. Nevertheless, they are not eligible for most public support (p. 16).

The relationship between food and housing insecurity, nontraditional students, and academic performance.

Material hardship seems to impede educational attainment. While there have not been studies (yet) measuring the impact of food and housing insecurity on college attainment, research from K-12 education and descriptive work in higher education is evident. For example, one study found that college students who report struggling to get enough food to eat are 22 percent less likely to earn a 3.5–4.0 GPA than a 2.0–2.49 GPA after controlling for other background factors (Maroto, Snelling, & Linck, 2015). In addition, Madeline Pumariega, former chancellor of the Florida University System, explained why Miami Dade College had taken steps to alleviate food insecurity in an interview Goldrick-Rab, Broton, and Gates (2013) did when she was president of the college's Wolfson campus. Pumariega states that:

> "When a student is hungry, he does not feel safe, and it is hard to help him synthesize material. Therefore, we must meet students' basic needs to fully concentrate on assimilating the information in a class so that they can apply it, learn, and take it forward" (Broton & Goldrick-Rab, 2017).

Broton & Goldrick-Rab (2017) argue that it can be challenging to focus on school when you are unsure where to sleep at night. Broton & Goldrick-Rab (2017) described meeting “Anne," a student in the Wisconsin Scholars Longitudinal Study. Anne went to college in Milwaukee to obtain the skills to find a good job and a better life for herself and her mother. Anne also met all the tenets of being considered a nontraditional student. This student had grown up in public housing as her mother cycled on and off assistance from the state, struggling to hold a job while coping with lupus, a chronic disease (Broton & Goldrick-Rab, 2017). Hagedorn and Olfert (2018) studied is the first to investigate the prevalence of food insecurity at a central Appalachian university and the second within the region altogether. However, the institution studied was not classified as an HBCU or Tribal College, the students who participated in the study identified as low socioeconomic status.

In conjunction with this study, Hagedorn and Olfert (2018) used McArthur et al. (2017) to help provide a representation of food insecurity and how it correlates in adult learners attending a large Appalachian university and the relationships between food security and behavior such as money expenditure, coping strategies, and academic progress. According to Hagedorn and Olfert (2018), over one-third of students (36.6%) were food-insecure, with a higher prevalence of food insecurity occurring in sophomore and junior year students, those who live off-campus, and those reporting poor health (p. 12). This increased food-insecure populations following the first year, like previous research in McArthur et al. (2017). Hagedorn and Olfert report that housing status becomes conflicted when there is an ongoing influence of food insecurity. Hagedorn and Olfert (2018) have found that it plays a significant role with some accompanied studies, and others show no differences in food security status by housing status. This study found that housing, specifically living off-campus, influenced the prevalence of food insecurity. The academic experience and housing influence are significant avenues for F.I. and H.I. interventions in at-risk populations.

Additionally, housing and academic experience were more common in McArthur et al. (2017), making them potential variables of interest throughout the Appalachian region. Hagedorn and

Olfert (2018) assessed academic achievement using the APS score in the present study. The APS score specifies how the student participants rated their overall progress in school, including graduating on time, class attendance, attention span in class, and understanding of concepts taught in class. In the study food-insecure, students displayed greater odds of receiving lower APS scores and lower GPA, representing poorer academic success (p 11). F.I. and H.I. are often associated with increased behavioral problems and emotional burdens that can impact a student's success in academia (Alaimo et al., 2001). In the college population, food-insecure students are less likely to attend and perform well in class and more likely to withdraw from a course altogether (Silva et al., 2015, Goldick-Rab, Richardson, and Hernandez, 2017). Hagedorn and Olfert (2018) present other studies that confirm this association through GPA and have found that students with a GPA above 3.1 were 60% less likely to be food and housing insecure, with another reporting food and housing insecure students having a mean GPA of 3.1 vs. 3.4 in food and housing insecure students. The limitation in this specific study is noted. It states that Hagedorn and Olfert (2018) used a non-probability sample from a single geographical population that is a predominately Caucasian public university and that it prevents any generalizations from being had for any universities outside of the Appalachian region, community colleges, or private institution and higher education institutions with ethnic diversity (p. 12). In addition, Hagedorn and Olfert (2018) reported that the self-report of measures might limit the validity of results. The inclusion of first-year students may provide skewed responses within the literature.

Basic Needs Insecurity at HBCUs.

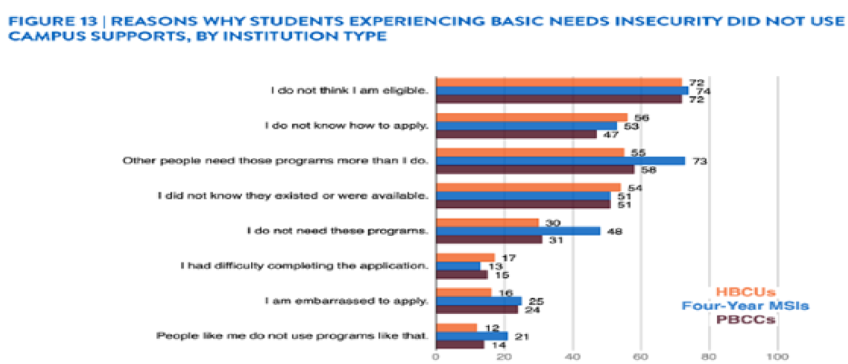
Historically Black Colleges and Universities (HBCUs) were established post- Civil War era to meet the demanding educational and social needs of freed Black Americans. Dahl et al. (2022)

state that these institutions help provide educational pathways to upward social mobility while having a long-standing commitment and dedication to promoting academic success and the overall holistic well-being of the student. In Fall 2020, Dahl et al. (2022) released the #RealCollegeHBCU Report. This report revealed that nearly 5,000 students from 14 public and private HBCUs responded to the survey, resulting in a response rate of 8.3% (pg 1). In addition to this study of the 14 public and private HBCUs that participated, one is a constituent of the UNC System. The survey revealed that two-thirds of HBCU students experienced basic needs insecurity (Dahl et al., 2022). In addition, this survey also reported that 46% of students experienced food insecurity in the last 30 days of the survey being taken. Furthermore, Dahl et al. (2022) reported that 55% were housing insecure in the prior 12 months of the survey being taken. Finally, Dahl (2022) reported that many students lost their jobs during the COVID-19 pandemic (pg. 1). Dahl et al. (2022) report that students at HBCUs lost their primary job by fall 2020.

Like HBCUs, other MSIs serve a significant number of students who intersect with economic, marginalized racial, and ethnic backgrounds. This means that students attending HBCUs and HBCUs may face similar or parallel challenges. However, four-year HBCUs differ from HBCUs. Dahl et al. (2022, pg. 8) state that HBCUs have different institutional histories, missions, and visions that do not always share HBCUs' core commitment to educating Black students and have not experienced underfunding from their governing source. Dahl et al. (2022) also state that HBCUs do not serve many Black students compared to HBCUs; their primary student population consists of those from other marginalized racial and ethnic backgrounds. Furthermore, Dahl et al. (2022) report that 57% of HBCU students whose primary job before the pandemic was part-time and 40% whose primary job was full-time lost their job. In addition to, one -in- five experienced reduced pay or hours. As of fall 2021, national unemployment rates remained higher than before the pandemic and continue to show racial and ethnic inequalities (pg. 12). According to Dahl et al. (2022, pg 22), they stated that:

> HBCU students who experience basic needs insecurity who did not utilize campus support frequently believed they did not qualify. More than half did not know the support existed or how to apply, while others believed that other people needed the support more than they did. Students at HBCUs less often report feeling embarrassed to seek out support than their peers at four-year MSIs or PBCCs. In other words, there seems to be less stigma associated with seeking out help at HBCUs compared to these other institutions, though stigma still impeded some students from seeking support.

Figure 3.



(Dahl et al., 2022 Basic needs insecurity at Historically Black Colleges and Universities: A #RealCollegeHBCU report. The Hope Center for College, Community, and Justice and the Center for the Study of HBCUs.)

Dahl et al. (2022) detail that public benefits provided by local, state, or federal government agencies provide the essential support for students facing basic needs insecurity (p. 20). However, many public benefits have complex processes and strict eligibility that burden students to apply for the benefits. However, these challenges may restrict students' access to support. That processes are rooted in racist narratives, particularly for women of color studies on nontraditional college students have shown that they are often at higher risk of not completing their postsecondary education because of life pressures and social backgrounds, yet they have also been found to be more intrinsically motivated than traditional college students (Shillingford & Karlin, 2013; Taylor & House, 2010; Wyatt, 2011). According to the Global Food Initiative (2019), just one estimate of the average annual price of college--- including fees and tuition, room and board, books and supplies, transportation, and other expenses for in-state students is nearly $18,000 at a public two year and more than $25,000 at a public four-year college and university. For instance, Food-insecure students displayed behaviors that differed from food secure students, including spending more money on other items, engaging in more coping strategies to find food, and having lower academic success in the classroom. The health of food-insecure students has been previously reported as being fair or poor compared to food secure students, comparable with our results (Hagedorn and Olfert, 2018). Though Dahl et al. (2022) focused on different HBCUs throughout the country the limitations to this study was that it didn’t involve Tribal College/Universities.

College Basic Needs Insecurity Interventions

In 2010, Food Safety News covered the increasing prevalence of food banks on college campuses (Minderhout, 2010). The article documents the numbers of K–12 students who receive food assistance through the National School Lunch and Breakfast programs (over 31 million students served in 2009) who attend college and are left without food assistance on campuses that lack food pantries (Maroto, 2013). Many four-year university students compete against the financial demands of rising tuition, textbooks, and housing costs, which may take away from funds spent on food. Minderhout (2010) spotlights the Oregon State University (OSU) food pantry, which serves over 200 students per month. Laura Pick coordinates the OSU. Foodbank says, "I think more colleges are recognizing that hunger is an issue for students and trying to combat it" (Minderhout, 2010, p. 1). Rivera (2010) published an article in the Los Angeles Times about the University of California, Los Angeles (UCLA), starting a food pantry program to combat food insecurity on its main campus. UCLA campus officials became concerned about the effects of the current economic downturn on students as they began to hear anecdotal evidence of hungry and homeless students on their campuses. During this time, The Food Closet received 40 to 50 student visitors every day who needed food. The article contains quotes from students who have left notes behind at the food pantry expressing their gratitude for the service and addressing the difficulty of admitting they needed help obtaining food (Maroto, 2013). To help demonstrate the necessity of The Food Closet program at UCLA, the article detailed expounding the numbers of college students struggling to afford a healthy diet highlighted in the USA. Today, an article entitled "Campus food banks help students through tough times" (Powers, 2012; Maroto, 2013). Besides providing food pantries, nutrition education is another possible intervention to combat food insecurity among adults. In a single-blind randomized study, Eicher-Miller (2009) examined this phenomenon with female food stamp recipients. Participants (N=219) were randomized to the experimental group (n=137). They received five nutrition education lessons to select and prepare healthy foods in their own homes, while the control group (n=82) did not receive nutrition education. Participants completed a pre-and post-test assessing their food security status using the 6-item HFSSM. Eicher-Miller (2009) found there were significant reductions in food insecurity in the experimental group compared to the control group (P=0.03) and concluded that "nutrition education is an appropriate intervention for food insecurity"

(Eicher-Miller et al., 2009, p. 161). Although these study participants were not college students that are not enrolled at HBCUs and Tribal Colleges, they could be classified as nontraditional students that participated in an informal learning setting that demonstrated that nutrition education may be a food insecurity intervention that could be explored for college students. The limitation to this study is that it did not address or recognize housing insecurity among its participants.

The University of California Global Food Initiative (Broton & Cady, 2020; University of California Global Food Initiative, 2017) reported that one-third of the adults in the United States lived in low-income households that have a median annual income of $25,000 a year for a three-person household, and even more live-in moderate-income households that struggle to make ends meet. However, they are not eligible for most public support (p. 16). With the income inequality gap increasing and wages staying stagnant in conjunction with the price of college increasing, this means nontraditional students and their families would contribute a larger share of family income towards paying for college and increasing their chances of facing F.I. and H.I. Though research shows that additional financial resources and aid improve degree attainment for students from low-income households, the current financial aid system does not promise these specific students financial security. However, most common best practices have been implemented successfully at the community college level to address students' basic needs. However, the best practices and trends to combat F.I. and H.I. are currently unknown. Breeden-Balaam (2020) expresses that community colleges are essential to helping individuals and their families improve their social and financial mobility; however, four-year HBCUs and Tribal Colleges have been recognized for the same, all the while offering a more holistic and intrusive student development experience in the process. Breeden-Balaam (2020) formulas for F.I. and

H.I. help address the need on community colleges, but with a few revamps regarding research, identification measures, and solutions, it could be a preventative measure on how to eliminate these specific barriers for current and future students who decided to attend the public HBCUs and Tribal Colleges in North Carolina. Breeden-Balaam (2021) suggests that in their quest to understand the implications of F.I., the research results obtained a more comprehensive outlook and data about a problem than either a quantitative or qualitative perspective could provide on its own. Breeden-Balaam (2021) shares that campus-based research should develop to create a protocol to identify a student in need. Breeden-Balaam (2021) recommends building a system of best practices by first starting at the stages of the admission of prospective or accepted students.

High Impact Practices in Adult Education

Haywood (2021) suggests that putting equity first in scaling high-impact practices (HIPs) helps Black, Latinx, and adult students thrive. In a Lumina-supported project, Haywood (2011) states that HIPs can benefit college students across the board, especially students of color and adult learners. Though this project effort was focused on Tennessee and its community colleges, the finding showed that:

> Sixty-four percent of students participated in a HIP during the first academic term.
> A higher percentage of Black (66 percent) and Hispanic or Latino (69 percent) students participated. Retention increased 22 percent for adult students, 23 percent for Black students, and 8 percent for Latino students participating in HIPs. HIPs are linked to improved outcomes for many shorter-term academic outcomes, including credit accumulation and gatekeeper course completion (Haywood, 2021).

Haywood (2021) highlighted in the Lumina report that the HIPs coordinated with the Tennessee Board of Regents (TBR) and the National Association of System Heads (NASH) to develop initiatives. The report offered three critical takeaways that helped ensure equitable access to effective HIPs.

Chapter III: Methodology

This chapter describes the quantitative methodology that was used to collect and analyze data for this study. The chapter is arranged in sections that will address the: a) overview of research methodology, b) research design, c) study population, d) instrumentation and materials, e) reliability and validity of survey tools, f) data analysis, and g) measures to protect participants' rights, i) summary.

Overview of Research Methodology

According to Creswell (2014), quantitative research is conducted by asking questions with measurable answers from participants. The quantitative approach helps the researcher test a theory by specifically narrowing down hypotheses and collecting data and using statistics to analyze numerical responses in an unbiased manner. The research problem describes trends or explanations of relationships between variables in quantitative research. Strategies of inquiry associated with quantitative research referred to the postpositivist worldview and originated mainly in psychology. These include actual experiments and the less rigorous experiments called quasi-experiments (Creswell, 2014, p 41). This research will implement a quasi-experiment method that will focus on GPA, F.I. and H.I., age, gender, and race. The quantitative approach works well in exploring the relationship between F.I. and H.I. and academic performance among nontraditional students enrolled at public HBCUs in North Carolina as the dependent variables. A quantitative cross-sectional design was employed to determine the relationship between academic performance and F.I. and H.I. and public HBCUs in North Carolina and to determine whether any correlation with GPA, age, gender, and race existed.

Research Design

A convenience sample of students on the six campuses designated as public HBCUs in North Carolina over the age of 18 was invited to participate in the study using a method through a digital intercept survey method (email and social media platforms). Students were approached by the researcher via university email communication and social media and asked if they would be willing to complete an anonymous survey that would take approximately ten (10) minutes. Informed consent was obtained from each survey participant to ensure that they understood the voluntary nature of participating in the study, the purpose of the study and that their responses would remain anonymous. In total, 42 students (41 students from each WSSU and one (1) student from NCCU) were surveyed using the Broton and Goldrick-Rab (2019) six (6) item HFSSM screener questions and Housing Insecurity screener survey that measured a 12-month timeframe for the food and housing security questions. In addition, to ask selected questions from the 2021 NCSSE and BSSE survey to determine if there are significant differences in academic performance and F.I. and H.I. among nontraditional students enrolled at public HBCUs in North Carolina. The 12-month timeframe has been proven more efficient to implement than a 30-day timeframe and has also been found to be more reliable than the 30 days' timeframe (Hamilton & Cook, 1997, Maroto, 2013). A draft of the survey is in Appendix A.

Sample size calculations were based on several variables, including the occurrences of F.I. and H.I. found in previous studies of college students, the desired confidence level, and the total student population combined of the public HBCUs located in North Carolina. Previous research conducted by Chapparro et al. (2009) found that 21 % of college students are food insecure. Broton and Goldrick-Rab (2014) conducted that 19% of students are housing insecure. According to research conducted by Dahl et al. (2022), in the fall of 2020, 46 % of students lacked sufficient access to Nutritional food a month before the survey was distributed. In addition, 55% reported that they struggled to maintain safe, affordable housing, and 20% said they were homeless in the last year (Dahl et al., 2022). Though this survey targeted 14 private and public HBCUs, the experience of F.I. and H.I. increased since the COVID-19 pandemic. The proposed study is based upon a sample size of 300, which is determined using the upper levels estimates of F.I. and H.I. found by Chaparro (2009) with a 95% confidence level. In addition, Dahl et al. (2022) sample size was 5,000 with an unknown confident level, but reports confirmed the high occurrences of F.I. and H.I. at HBCUs around the country designated as private and public.

Furthermore, 42 were surveyed for this study. Also, in gathering information on F.I. and H.I., GPA, race, gender, and age were gathered. The questions on academic performance were adapted from questions from the NCSSE and BSSE Survey instrument and F.I. were adapted from the USDA (2020) survey instrument. H.I. instrument was adapted from Broton and Goldrick-Rab (2018).

Research Questions

1. To what degree do nontraditional students at public HBCUs in North Carolina report experiences of F.I. and H.I.?

2. Is there a significant relationship based on nontraditional student demographics (age, gender, race) and experiences of F.I. and H.I. at public HBCUs in North Carolina?

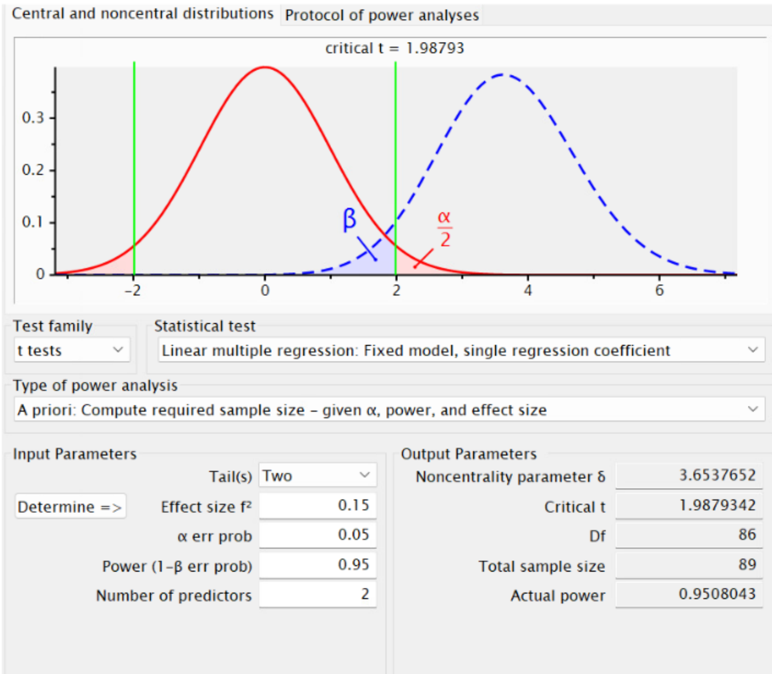
3. Is there a significant relationship between cumulative GPA earned and F.I. & H.I.?

4. Is there a correlation between participation in co-curricular activities and experiencing F.I. and H.I. for nontraditional students at public HBCUs in North Carolina?

Study Population

The study was conducted at institutions that are constituents of the UNC System. Furthermore, these institutions will have a federal designation as an HBCU. Each institution is in a different region of the state with divergent demographic populations. The researcher used power analysis to determine whether the statistical tests were sufficient to draw a reasonable conclusion and determine the sample size for the study (IBM SPSS Inc., 2021). Power analysis is a critical step in quantitative research; it accounts for the probability of Type I errors, denoted as alpha or α, or Type II errors, denoted as beta or β, that may occur during the hypotheses testing (Bagiella & Chang, 2019). The effect size is vital in establishing the practical importance in addition to the statistical significance of the findings (Urdan, 2022). The G* Power 3.1 command calculation involved running t-test and a priori which is designed to compute the required sample size based off the power and effect size (Pope, 2023 and King, 2021). The G*Power 3.1 revealed that minimum sample size of 89 was needed for a power of 0.95 (β=0.95), an alpha significance level of 0.05. The G*Power 3.1 showed the targeted sample was needed to achieve a medium effect size (f2 = .15) to help prevent Type II errors (Kang, 2021), as described in Figure 4.

Figure 4



*G*Power Sample and Effect Size Computation*
Actual Sample Used in the Study

HBCU A-WSSU

According to IPEDS (2020), HBCU A is a four (4) year institution classified as a midsize university located in a city. With a student population of 5,169 (4,689 undergraduates). HBCU A awards degrees ranging from bachelor's to professional practice Doctoral degrees. Based on the number of undergraduates entering post-secondary education for the first time, IPEDS (2020) reports that 735 (76%) of its students at HBCU A received some federal aid in the average amount of $5,623. Furthermore, IPEDS (2020) reports that 729 (76%) students at HBCU A received Pell grants in the average amount of $5,313. Total enrollment in Fall 2020 was 4,686 for undergraduate, 425 for undergraduate transfer enrollment, and 480 for graduate enrollment.

Undergraduate attendance status was 86% full-time and 14% part-time (IPEDS, 2020). Undergraduate student gender was 76% female and 24% male (IPEDS, 2020). The race/ethnicity of HBCU A was 75% Black/African American, 7% White, 4% Hispanic/Latino, 4% of two or more races, and 1% Asian (IPEDS, 2020). IPEDS (2020) reports that the average undergraduate student age for HBCU A was 83% for 24 years and under and 17% for 25 years and over. However, HBCU A reports that 70% of its undergraduate students are enrolled in some distance education, and 26% are enrolled only in distance education (IPEDS, 2020). Furthermore, HBCU A reported that 50% of its graduate population was enrolled only in distance education, and 39% enrolled in some distance education (IPEDS, 2020). HBCU A also reports that retention rates for first-time students pursuing bachelor's degrees were 77% for full-time students and 76% for part-time students (IPEDS, 2020). This percentage was based on students who began their post-secondary experience at HBCU A in the Fall of 2019 and returned in Fall 2020 (IPEDS, 2020). According to IPEDS (2020), HBCU A had 67% of its students entering as "full-time, first time" in 2020. Graduation rates for students enrolled at HBCU A that began Fall 2012 were 23% and 27% that began in Fall 2014 (IPEDS, 2020). Graduation rates for a student who began in Fall 2012 and graduated six years later were 48% and 50% who began in 2014 (IPEDS, 2020). Graduation rates for students who began in Fall 2012 and graduated eight years later were 49% (IPEDS, 2020). According to IPEDS (2020), HBCU A bachelor's degree graduation rates measure the percentage of entering students beginning their studies full time, planning to earn a bachelor’s degree, and completing their degree program within a specified amount of time. HBCU A 6-year graduation rate by gender for students pursuing bachelor's degrees was 40% males and 54% female (IPEDS, 2020). HBCU A 6- year graduation rate by race/ethnicity for students pursuing bachelor's degrees was 50% Black/African American, 33% American Indian or Indigenous, 48% Hispanic/Latino, 48% White, 55% race/ethnicity unknown, and 50% two or more races (IPEDS, 2020). According to IPEDS (2020), these percentages of full-time students who began their studies in Fall 2014 and received a degree or award within 150% of the "normal time" to completion of their program (IPEDS, 2020). In this IPEDS (2020) report, alternative measures of student success were implemented to determine the outcome measures. HBCU A reports that alternative student success measures were implemented for first full-time, part-time, and non-first time (transfer in) students (IPEDS, 2020). These measures also reported students receiving Pell Grants and those who did not receive Pell grants. The measures used helped provide the 8- year award completion rates by specific award level such as certificate, associate's, and bachelor's degrees after entering the institution (IPEDS, 2020).

HBCU B- NC A&T

According to IPEDS (2020), HBCU B is a four (4) year institution classified as a large university with its campus located in a city. With a student population of 12,753 (11,130 undergraduates), HBCU B awards degrees from bachelor's to doctor's degrees with concentrations in research and scholarship. HBCU B reports that 2,187 (96%) received financial aid (IPEDS, 2020). Furthermore, HBCU B reports that 1,384 (61%) received Pell grants while 1,640 (72%) received institutional grants or scholarships in 2019-2020 (IPEDS, 2020). Total enrollment in Fall 2020 was 11,130 for undergraduate, 764 for undergraduate transfer enrollment, and 1,623 for graduate enrollment. In fall 2019, HBCU B reported that the undergraduate attendance status was 89% full-time and 11% part-time (IPEDS, 2020). Undergraduate student gender was 59% female and 41% male (IPEDS, 2020). The race/ethnicity of HBCU B was 82% Black/African American, 5% White, 4% Hispanic/Latino, 4% of two or more races, and 1% Asian (IPEDS, 2020). IPEDS (2020) reports that the average undergraduate student age for HBCU B was 89% for 24 years and under and 11% for 25 years and over. However, HBCU B reports that 61% of its undergraduate students are enrolled in some distance education, and 36% are enrolled only in distance education (IPEDS, 2020). Furthermore, HBCU B reported that 61% of its graduate population was enrolled only in distance education, and 18% enrolled in some distance education (IPEDS, 2020). HBCU B also reports that retention rates for first-time students pursuing bachelor's degrees were 80% for full-time students and 40% for part-time students (IPEDS, 2020). This percentage was based on students who began their post-secondary experience at HBCU B in the Fall of 2019 and returned in the Fall of 2020 (IPEDS, 2020). According to IPEDS (2020), HBCU B had 68% of its students entering as "full-time, first time" in 2020. Graduation rates for students enrolled at HBCU B that began in Fall 2012 were 26% and 26% in Fall 2014 (IPEDS, 2020). Graduation rates for a student who began in Fall 2012 and graduated six years later were 53% and 52% who began in 2014 (IPEDS, 2020). According to IPEDS (2020), HBCU B bachelor's degree graduation rates measure the percentage of entering students beginning their studies full time, planning to earn a bachelor's degree, and completing their degree program within a specified amount of time. HBCU B 6-year graduation rate by gender for students pursuing bachelor's degrees was 45% males and 58% female (IPEDS, 2020). HBCU B 6- year graduation rate by race/ethnicity for students pursuing bachelor's degrees was 54% Black/African American, 17% American Indian or Indigenous, 48% Hispanic/Latino, 39% White, 64% race/ethnicity unknown, and 34% two or more races (IPEDS, 2020). According to IPEDS (2020), HBCU B percentages of full-time students who began their studies in Fall 2014 and received a degree or award within 150% of the "normal time" to completion of their program (IPEDS, 2020). In this IPEDS (2020) report, alternative measures of student success were implemented to determine the outcome measures. HBCU B reports that alternative student success measures were implemented for first full-time, part-time, and non-first time (transfer in) students (IPEDS, 2020). These measures also reported students receiving Pell Grants and those who did not receive Pell grants. The measures used helped provide the 8- year award completion rates by specific award level such as certificate, associate’s, and bachelor's degrees after entering the institution (IPEDS, 2020).

HBCU C- NCCU

According to IPEDS (2020), HBCU C is a four (4) year institution classified as a large university with its campus located in a city. With a student population of 8,078 (6,067 undergraduates), HBCU C awards degrees from bachelor's to doctor's degrees that have concentrations in professional practice, research, and scholarship. HBCU C reports that 982 (96%) received financial aid (IPEDS, 2020). Furthermore, HBCU C reports that 761 (74%) received Pell grants while 824 (81%) received institutional grants or scholarships in 2019-2020 (IPEDS, 2020). Total enrollment in Fall 2020 was 8,078 for undergraduate, 457 for undergraduate transfer enrollment, and 2,011 for graduate enrollment. In fall 2019, HBCU C reported that the undergraduate attendance status was 82% full-time and 16% part-time (IPEDS, 2020). Undergraduate student gender was 70% female and 30% male (IPEDS, 2020). The race/ethnicity of HBCU C was 78% Black/African American, 6% White, 7% Hispanic/Latino, 5% of two or more races, and 1% Asian (IPEDS, 2020). IPEDS (2020) reports that the average undergraduate student age for HBCU C was 82% for 24 years and under and 18% for 25 years and over. However, HBCU C reports that 40% of its undergraduate students enroll in some distance education, and 13% enroll only in distance education. Furthermore, HBCU C reported that 35% of its graduate population was enrolled only in distance education, and 21% enrolled in some distance education (IPEDS, 2020). HBCU C also reports that retention rates for first-time students pursuing bachelor's degrees were 78% for full-time students and 25% for part-time students (IPEDS, 2020). This percentage was based on students who began their post-secondary experience at HBCU C in the Fall of 2019 and returned in the Fall of 2020 (IPEDS, 2020). According to IPEDS (2020), HBCU C had 63% of its students entering as "full-time, first time" in 2020. Graduation rates for students enrolled at HBCU B that began in Fall 2012 were 21% and 27% in Fall 2014 (IPEDS, 2020). Graduation rates for a student who began in Fall 2012 and graduated six years later were 45% and 52% who began in 2014 (IPEDS, 2020). According to IPEDS (2020), HBCU C bachelor's degree graduation rates measure the percentage of entering students beginning their studies full time and planning to earn a bachelor’s degree and who complete their degree program within a specified amount of time. HBCU C 6-year graduation rate by gender for students pursuing bachelor's degrees was 49% males and 53% female (IPEDS, 2020). HBCU C 6- year graduation rate by race/ethnicity for students pursuing bachelor's degrees was 53% Black/African American, 50% American Indian or Indigenous, 41% Hispanic/Latino, 39% White, 64% race/ethnicity unknown, and 34% two or more races (IPEDS, 2020). According to IPEDS (2020), HBCU D percentages of full-time students who began their studies in Fall 2014 and received a degree or award within 150% of the "normal time" to completion of their program (IPEDS, 2020). In this IPEDS (2020) report, alternative measures of student success were implemented to determine the outcome measures. HBCU C reports that alternative student success measures were implemented for first full-time, part-time, and non-first time (transfer-in) students (IPEDS, 2020). These measures also reported students receiving Pell Grants and those who did not receive Pell grants. The measures used helped provide the 8- year award completion rates by specific award level such as certificate, associate’s, and bachelor's degrees after entering the institution (IPEDS, 2020).

HBCU D- ECSU

According to IPEDS (2020), HBCU D is a four (4) year institution classified as a small/rural distant university with its campus located in a town. With a student population of 2,002 (1,910 undergraduates), HBCU D awards degrees from bachelor's to master's degrees. HBCU D reports that 364 (96%) received financial aid (IPEDS, 2020). Furthermore, HBCU D reports that 277 (73%) received Pell grants while 230 (60%) received institutional grants or scholarships in 2019-2020 (IPEDS, 2020). Total enrollment in Fall 2020 was 2,002 for undergraduate, 201 for undergraduate transfer enrollment, and 92 for graduate enrollment. In fall 2019, HBCU D reported that the undergraduate attendance status was 85% full-time and 15% part-time (IPEDS, 2020). Undergraduate student gender was 59% female and 41% male (IPEDS, 2020). The race/ethnicity of HBCU D was 68% Black/African American, 18% White, 5% Hispanic/Latino, 5% of two or more races, and 1% Asian (IPEDS, 2020). IPEDS (2020) reports that the average undergraduate student age for HBCU D was 82% for 24 years and under and 18% for 25 years and over. However, HBCU D reports that 65% of its undergraduate students are enrolled in some distance education, and 29% are enrolled only in distance education. Furthermore, HBCU D reported that 57% of its graduate population was enrolled only in distance education, and 29% enrolled in some distance education (IPEDS, 2020). HBCU D also reports that retention rates for first-time students pursuing bachelor's degrees were 76% for full-time students and 50% for part-time students (IPEDS, 2020). This percentage was based on students who began their post-secondary experience at HBCU D in the Fall of 2019 and returned in the Fall of 2020 (IPEDS, 2020). According to IPEDS (2020), HBCU D had 56% of its students entering as "full-time, first time" in 2020. Graduation rates for students enrolled at HBCU D that began in Fall 2012 were 21% and 21% in Fall 2014 (IPEDS, 2020). Graduation rates for a student who began in Fall 2012 and graduated six years later were 42% and 43% who began in 2014 (IPEDS, 2020). According to IPEDS (2020), HBCU D bachelor's degree graduation rates measure the percentage of entering students beginning their studies full time and planning to earn a bachelor’s degree and who complete their degree program within a specified amount of time. HBCU D 6-year graduation rate by gender for students pursuing bachelor's degrees was 43% males and 43% female (IPEDS, 2020). HBCU D 6- year graduation rate by race/ethnicity for students pursuing bachelor's degrees was 44% Black/African American, 0% American Indian or Indigenous, 50% Hispanic/Latino, 39% White, 67% race/ethnicity unknown, 67% two or more races, and 0% Asian (IPEDS, 2020). According to IPEDS (2020), HBCU D percentages of full-time students who began their studies in Fall 2014 and received a degree or award within 150% of the "normal time" to completion of their program (IPEDS, 2020). In this IPEDS (2020) report, alternative measures of student success were implemented to determine the outcome measures. HBCU D reports that alternative student success measures were implemented for first full-time, part-time, and non-first time (transfer in) students (IPEDS, 2020). These measures also reported students receiving Pell Grants and those who did not receive Pell grants. The measures used helped provide the 8- year award completion rates by specific award level such as certificate, associate’s, and bachelor's degrees after entering the institution (IPEDS, 2020).

Null Hypotheses

H_0: Nontraditional will report experiences of F.I. and H.I. at public HBCUs in North Carolina.

H_0: There will be a significant relationship based on nontraditional student demographics (age, gender, race) and experiences of F.I. and H.I. at public HBCUs in North Carolina

H_0: There will be a significant relationship between cumulative GPA and F.I. & H.I. of nontraditional students at public HBCUs in North Carolina

H_0: There will be an inverse correlation between participation in co-curricular activities and experiencing F.I. and H.I. for nontraditional students at public HBCUs in North Carolina**.**

Variables

According to the Chaparro (2009) and Nord et al. (2011), specific demographic populations such as African Americans, Hispanics, Latinx, and women who are single parents and students living independently are more likely to experience F.I. and H.I. Demographics populations in this study include the nontraditional students' age, gender, single-parent status, race/ethnicity, income, and housing status and are found in the demographic questions of the survey instrument.

Independent Variables

The independent variable (IV) in this study is F.I. and H.I. The IV's will be assessed using Broton and Goldrick-Rab (2018) Homeless and Housing Insecurity screener questionnaire to measure H.I. In conjunction with using Broton and Goldrick-Rab (2018) F.I. screener that's been adapted from the Department of Agriculture's (USDA) 6- item Food Security Survey Module (FSSM) (USDA ERA, 2020). The (6) six-item module is a subset of the U.S. Adult Household Food Security 10-item and 18-item module and the U.S. Household Food Insecurity. Currently, there is not a validated instrument for assessing student housing insecurity. However, to measure housing insecurity, the construct will be measured by utilizing survey items that have been adapted from other previous research and surveys where the survey content was in publication (Goldrick-Rab et al., 2015; Tsui et al., 2011; Wisconsin HOPE Lab, 2016).

Dependent Variables

Dependent variables in this study are student GPA and co-curricular experiences, which will be assessed in the survey in questions 12- 22. In conjunction to measure academic performance the Beginning College Survey of Student Engagement (BCSSE) and NSSE (National Survey of Student Engagement) instrument created by the Indiana University Center of Post-Secondary Education within the College of Education (Indiana University School of Education, 2020) in questions 1-21.

Instrumentation and Materials

Elements of Food Insecurity

Tables 1 and 2 will be used to assess the F.I. and H.I. status of survey respondents. The significance of the questions in that section of the survey will be explained in this section. Though research is limited on H.I., research conducted on F.I. within nonprofit and government entities reports the prevalence of F.I. and H.I. in the United States and how they are expressed and interpreted in quantitative measures and research. However, reading and researching the history of F.I. and H.I. measurement reveals that the foundational survey for measuring basic needs insecurity was based on phenomenological qualitative data collected (Broton, 2019). In previous research conducted on F.I., the Radimer Cornell Survey was used to capture data to quantify the experience and positive responses of adults and children experiencing F.I. (Radimer, 1990). The researchers developed a survey that was based on descriptions of women and their experiences with F.I., including the psychological aspects and outcomes of hunger, coping strategies to deal with hunger, and confounding variables associated with hunger (Radimer, 1990). The methods executed in collecting responses in interviews consisted of open-ended questions. Though this survey was a quantitative approach to search for facts through questionnaires and statistics, the responses were gathered from participants that identified as women. Their responses were highly detailed and then broken down into four general areas that connected to their experiences with hunger such as 1) problems with quantity of food intake, 2) problems with quality of food intake, c) problems with their supply of food, and d) food supply anxiety (Maroto, 2013; Radimer, 1990).

According to Maroto (2013), based on data gathered in the interviews, a quantitative survey in the scale assessing hunger was developed to include all relevant dimensions related to the experiences and severity of food insecurity and was found to be reliable and valid in its measurement. The USDA incorporated part of the Radimer Cornell Scale to expand the Household Food Security Survey Module (HFSSM). The USDA HFSSM scale is widely used to assess food insecurity on the national, state, and local levels in the United States. Table 1 details the (6) six-item USDA HFSSM screener questions that will be employed in this study. The (6) six-item HFSSM scale will be focused on F.I. experiences within the last 12 months of the distribution. This is the most comprehensive and widely used food security measure available. Food Insecurity is measured in the United States due to constrained economic and fiscal resources. Questions in the HFSSM detail the concepts of economic constraint by including words indicating that money or affordability was the main driving reason for food supply anxiety, decreased quantity, or quality of food intake (Maroto, 2013; Wunderlich,2006). Though research is limited regarding students enrolled at four-year public HBCUs experiencing H.I., Broton and Goldrick-Rab (2019) discuss how their 2016 questionnaire was geared to indicate the estimates that indicated that one in two community college students experience housing insecurity challenges. Broton and Goldrick-Rab (2019) also found that among four-year college students using this instrument help estimate that at least 1 and 10 and up to 1 and 5 reported H.I.

(p. 128). Table 2 is to collect data for students who experience H.I. alongside F.I. at public HBCUs in North Carolina. The questionnaire used in these studies by Broton and Goldrick-Rab (2019) in study 1 (2016) and study 2 (2015) will be employed in this study. Though these screener questions in studies 1 and 2 were asked in 2015 and 2016, Broton and Goldrick-Rab (2019) differentiated these studies' questionnaires by asking about experiencing F.I. and H.I. in a span of 3+ days over the past month instead of 12+ months over the past year. Broton and Goldrick-Rab (2019) 2016 F.I. and H.I. screener questions focused on H.I. focused on 3+ months over the past year. This study F.I. and H.I. questionnaire will focus on collecting data of nontraditional students experiencing F.I. and H.I. within the past 12 months for measure and study.

Table 1.

HFSSM Screener Scale
Food Insecurity Level
High Security (Score=0)
Marginal Security (Score =1)
Low Security (Score= 2-4)
Very Low Security (Score= 5-6)
Response Options: **(1) Yes, (0) No, (97) Don't Know**
Items
1. The food that I bought just did not last, and I did not have money to get more.
2. I could not afford to eat balanced meals
3. Any days: Did you ever cut the size of your meals or skip meals because there was not enough money for food? **3a. (If yes to Question 3) How often did this happen–almost every month, some months but not every month, or in only 1 or 2 months?**
4. 3+ months Did you ever cut the size of your meals or skip meals because there was not enough money for food? **4a. (If yes to Question 4) How often did this happen–almost every month, some months but not every month, or in only 1 or 2 months?**
5.Did you ever eat less than you felt you should because there was not enough money for food?

6.Were you ever hungry but did not eat because there was not enough money for food?

(Broton and Goldrick-Rab, 2019)

Table 2.

Housing Insecurity Among Nontraditional Students at Public HBCUs in North Carolina Response Options: (1) Yes, (0) No
Housing Insecurity
High Security (Score=0)
Marginal Security (Score =1)
Low Security (Score= 2-4)
Very Low Security (Score= 5-6)
1. Within the past 12 months, have you had difficulty paying rent
2. In the past 12 months, have you not paid full amount of rent
3. In the past 12 months, have you paid the full amount of your utilities (water, gas, phone, internet)
4. In the past 12 months, have you moved two or more times per year
6. In the past 12 months, have you moved in with other people due to financial problems

(Broton and Goldrick-Rab, 2019)

The methodology on the (6) six-item HFSSM screener outlines those responses to these questions are to be coded on a 10-point scale. Participants' responses of almost every month, some months but not every month, or in only 1 or 2 months are coded as affirmative and worth 1-point. Adult learners who participate will fall under the following level(s) are as "high food security" (score of zero), "marginal food security" (score of 1 or 2), "low food security" (score of 3 to 5), or "very low food security" (score of 6 to 10). High and marginal food security are considered "food secure" while low and very low food security are considered "food insecure" (Maroto, 2013; Bickel et al., 2000). Table 3 includes a summary of food security levels and what each level indicates.

Table 3: USDA Food Security Indications

General Categories	Labels	Description of Household Conditions
Food Security	High Food Security	No reported indications of food access problems or limitations

	Marginal Food Security	Answers 1 or 2 survey questions affirmatively. Indicates anxiety over food sufficiency or shortage of food in house. Little to no indication of changes in diet or food intake (Maroto, 2013)
Food Insecurity	Low Food Insecurity	Answers 3 to 5 survey questions affirmatively. Reports of reduced quality, variety, or desirability of diet. Little or no indication of reduced food intake (Maroto, 2013).
	Very Low Food Insecurity	Answers 6 to 10 survey questions affirmatively. Reports of multiple indications of disrupted eating patterns and reduced food intake (Maroto, 2013).

(Maroto, 2013; United States Department of Agriculture Economic Research Service, 2010)

Table 4 will include screener questions from the 2021 NCSSE and BSSE Survey instrument to determine if there are significant differences in academic performance. This instrumentation aims to help measure co-curricular experiences outside of the classroom but still provide clarity on how nontraditional students are still academically active within their HBCU in a nonformal learning setting. In addition, this instrument is to help give details by determining the nontraditional student activity when differentiating their co-curricular experiences and involvement versus their extracurricular activities. The NCSSE and BSSE questions is worded as follows:

Table 4: Academic Performance Screener Questions

BCSSE
8. During the last year of college, about how many hours did you spend in a typical 7-day week doing the following? **Response options: (1) 0, (2) 1-5, (3) 6-10, (4) 11-15, (5) 16-20, (6) 21-25, (7) 26-30, (8) More than 30** **A. Preparing for class (studying, reading, doing homework, etc.).** **B. Participating in co-curricular activities (organizations, school publications, student government, sports, etc.).** **C. Working pay off-campus** **D. Commuting to campus (driving, walking, etc.)**

17. During the last school year, how certain were you that you did the following? **Questions A-D captures expected engagements in collaborative learning.** **Response options: (4) Very often, (3) Often, (2) Sometimes, (1) Never** **A. Ask another student to help you understand course material** **B. Explain Course material to one or more students** **C. Prepare for exams by discussing or working through course material with other students.** **D. Work with other students on course projects or assignments** **Question E-I captures expected engagement with faculty** **E. Discuss your academic performance with a faculty member** **F. Come to class without completing reading or assignments**
19. During the last school year, how certain were you that you met with or used the following? **Response options: (4) Very often, (3) Often, (2) Sometimes, (1) Never** **A. Faculty members** **B. Academic advisors** **C. Learning support services (tutoring, writing center, success coaching, etc.)** **D. Friends or other students** **E. Family members**
26. In the last 12 months, were you a full-time student at this institution? **Response options: (1) Yes, (0) No**
NSSE
37. Are you a student-athlete on a team sponsored by your institution's athletics department? **Response options: Yes or No**

GPA Question

Survey Question 17 asks students to self-report their Grade Point Average. In addition to providing numerical choices, letter grade averages are included to help students who may not be sure of their GPA within their institution. This data was collected to examine if there is a relationship between F.I. and H.I. and academic performance. Prior research on F.I. and H.I. and academic performance suggests that adverse cognitive skills and academic success is needed to understand whether there is a relationship and may exist in the HBCU nontraditional student population (Maroto, 2013). The GPA question is worded as follows:

Question #17: What is your current GPA (Grade Point Average) at this institution?

A. A (4.0)
B. A- (3.67)
C. B+ (3.33)
D. B (3.00)
E. B- (2.67)
F. C+ (2.33)
G. C (2.00)
H. C- (1.67)
I. D+ (1.33)
J. D (0.67)
K. F (0.00)

Demographic Questions

Survey questions 18-26 assess student demographic characteristics, including age, gender, living situation, race/ethnicity, and income. These demographic characteristics have been determined to be important predictors of F.I. and H.I. in current and prior research. These characteristics will allow for similarity between participants and institutions in the proposed study. The Demographic questions follow:

Question# 18: What is your age?

A. 17-18
B. 19-20
C. 21-22
D. 23-24
E. 25+

Question# 19: What is your classification?

A. First Year/Freshmen

B. Sophomore
C. Junior
D. Senior
E. Graduate/Professional Student

Question# 20: What gender do you identify as?

A. Male
B. Female
C. Trans Woman
D. Trans Man
E. Non-Binary
F. Prefer to self-describe: ___________
G. I prefer not to say

Question# 21: What is your living situation?

A. Alone
B. With Parents/Relatives
C. With Spouse/Partner
D. With Roommates off campus
E. With Roommates on campus
F. Local Shelter
G. Other: ________

Question# 22: Are you a single parent and/or caretaker for a dependent?

A) Yes
B) No

Question # 23: Are you a Commuter Student

A. Yes
B. No

Question# 24: Are you enrolled in meal plan provided by the university.

A. Yes
B. No

Question# 25: Which of the following do you consider yourself to be (Check all that apply)

A. African American/Black (Non-Hispanic)
B. American- Indian/ Indigenous
C. Hispanic/Latinx
D. Asian or Pacific Islander
E. White (Non-Hispanic)
F. Non-Resident Immigrant (indicate nationality) _____
G. Bi-Racial (two races)
H. Unknown

Question# 26: What is your average income per month?

A. $0-$500
B. $501-$750
C. $751-$1,000
D. $1,001-$1,500
E. $1,501-$2,000
F. Greater than $2,001
G. Don't Know

This study used quantitative methodology to examine the relationship between F.I. and H.I. between nontraditional and their academic performance that are enrolled at public HBCUs in NC. This study will focus on six public HBCUs in North Carolina using the USDA (6) six-item HFSSM, H.I. and Academic Performance screener questions and examine the relationship between F.I. and H.I. status, GPA, and co-curricular experiences. Other items on the survey included age, gender, race/ethnicity, and living situation. The research questions that this study pursues to answer are in Chapter 1 and are compared with the survey instruments in Tables 1-5. The full survey is in Appendix A.

Table 5 Alignment of Survey and Research Questions

Survey Section	Survey Heading	Survey Questions (See Appendix A)	Research Questions (See Chapter 1)
A	**Food Insecurity Questions**	**1-6**	**1,2**
B	**Housing Insecurity Questions**	**7-11**	**1,2**
C	**Academic performance (BCSSE/NSSE) Questions**	**12-16**	**4**
D	**GPA Questions**	**17**	**3**
E	**Demographic Questions**	**18-26**	**1,2**

Reliability and Validity of Survey Tool

Six (6) HFSSM Screener Item Survey

The validity of the six (6) item screener questions is adapted from the USDA HFSSM Item Survey. This survey is a shorter version of the USDA HFSSM six (6) item survey; it was assessed by the National Research Council of the National Academies of Sciences. This organization is responsible for advising the federal government on scientific matters (Maroto,2013; Wunderlich,2006). Three major categories of food insecurity, the categories were: whether the household experienced "uncertainty, insufficiency in quality of food, reduced food intake; or the feeling of hunger" (Maroto, 2013, Wunderlich, 2006, p. 59), and then compared these categories with questions on the HFSSM survey. According to Maroto (2013, p. 76),

> "The researchers found in the USDA HFSSM Survey that questions 1 and 2 related to the household experience of uncertainty and food depletion, question 3 relates to insufficiency in quality or quantity of diet, and questions 4 to 8a relate to reduced food intake or the feeling of hunger. In addition, the concept of the balanced meal (question 3) is included based on the ethnographic research of Radimer (1990) as she found that food-insecure women expressed concerns about not having specific foods or food groups in their diet."

Though the six (6) item screener instrument questions created by Broton and Goldrick-Rab (2019) are shortened, they follow the assessment report that the National Research Council completed. In addition, it detailed that the 12-month and 30-day time frames are accurate reference periods for the survey. For example, Broton and Goldrick-Rab (2019) questions 1 and 2 focused on the levels of uncertainty and food depletion, while six (6) item USDA HFSSM questions 1 and 2 focused on the same.

In addition, Hamilton & Cook (1997) provided further analysis validating the HFSSM was conducted by the USDA Food and Nutrition Service, Office of Analysis, Nutrition and Evaluation (Maroto, 2013; Hamilton & Cook, 1997). Hamilton et al. (1997) went forth with the work of validating the HFSSM used in their work to survey households experiencing F.I. Hamilton et al. (1997) research used a sample of 18,370 households that participated in the study to measure F.I. to help finalize the development of the HFSSM (Maroto, 2013). The HFSSM has undergone extensive reliability testing over the years. According to Hamilton & Cook (1997), an instrument is reliable when it can provide results if administered to the same individual under similar circumstances on two or more occasions. Hamilton & Cook (1997) suggests that scores of .7 to .9 are generally regarded as acceptable reliability values within education and health research. The six (6) item HFSSM has been the instrument of choice and reliability test through the years. For example, reliability tests such Spearmen-Brown reliability estimate, Rulon's reliability estimate, Cronbach's alpha, and Rash reliability estimate (Maroto, 2013; p. 79). According to Maroto (2013), these reliability tests showed values ranging from .86 to .93 on the 12-month scale (p.79). In addition, when using the six (6) item HFSSM survey Hamilton et al. (1997) detail how the 12-month timeframe exceeds the 30-day timeframe in terms of reliability (p.23).

The H.I. and Homelessness Screener Item Survey

The reliability and validity of the H.I. survey tool will rely on its ability to quantify the underlying characteristics and experiences of the targeted populations at HBCUs. The reliability and validity of the H.I. survey tool will help determine valid estimates that require two inferential steps: (1) survey sample to the target population and (2) measures items in concepts of interest. (Broton, 2020, Groves et al., 2009). Broton (2020) describes this specific empirical approach towards determining H.I. and homelessness as valid and reliable measures because of the complex concept of H.I., including the dimensions of affordability, stability, adequacy, and safety that permits the researcher to help determine levels of severity and duration of H.I. or homelessness (p. 27). Due to datasets for H.I. yet to exist and research is limited to H.I. and homelessness among samples of college students, specifically HBCUs do not exist. Broton (2020) states there would be a national survey study in general to gather comprehensive, reliable, and valid measures to understand the complicated concepts of H.I. and homelessness (p. 27). However, after reviewing existing studies and research of four-year college students that include any measures of H.I. or homelessness (ex- strength in inferential step 1 between sample and population) and limited research on H.I. among similar HBCUs across the country (ex: strength in inferential step 2 between measured items and concept); these two approaches together are the most reliable and valid to help provide the best evidence of the frequency of the problem given their methodological strengths and weaknesses (Broton, 2020, p 27).

BCSSE Survey Items

Student engagement has been identified as a predictor of student.

persistence and academic success (Law, 2015; Astin, 1984; Kuh, Schuh, & Whitt, 1991; Kuh et al., 2005). The BCSSE was chosen as a measurement for reliability and validity in the study because it provides a detailed outline for students and their expected level of engagement with co-curricular experiences. Law (2015, p 58) states:

> "When paired with the NSSE, the BCSSE serves as a pre-assessment, with the NSSE functioning as a post-assessment. Researchers found that validity may be affected if students inflate aspects of their performance or behavior (Converse & Presser, 1989; Porter, 2011)."

In addition, criticism against BCSSE and NSSE has been levied regarding their lack of representation for culturally diverse students. Specifically, those identified as African American, Hispanic, LatinX, or Asian (Law, 2015; Dowd, Sawatzy, & Korn, 2011). With these critiques taken into scholarly and ethical consideration, once reading the finding of McCormick & McClenney (2012), the NSSE survey responded and performed well for students that reported from different racial and ethnic backgrounds (McCormick & McClenney,2012, p. 36). According to the Law (2015), the BCSSE is designed to complement NSSE results by providing a clear picture of students' engagement expectations (p. 58). However, in this study, this instrument has been edited to collect students' responses regarding their past engagement, co-curricular experiences, and estimations of how many hours within the last academic year they spent on similar activities. The specific questions from BCSSE consist of eight (8) questions categorized into affirmative responses and scaled responses (Law, 2015):

1. **Expected academic performance**. Examines relevant behaviors the student is expected to engage in during their enrollment at the institution.
2. **Expected academic perseverance**. Examines the amount of difficulty students expect regarding their academics during their past academic year enrolled at the institution.
3. **Perceived Academic Preparation.** Examines the student’s perception of their academic preparation during their enrollment at the institution through co-curricular experiences.

This study utilizes the first three affirmative scales and seven scales to determine the HBCUs anticipated engagement with the past academic year. The complete survey for this study can be found in Appendix A. BCSSE data provided information about students' level of certainty during academic adversity, expected levels of academic difficulty during the past academic year, and perceptions of academic preparedness.

NSSE Survey Items

The NSSE (see Appendix A) assesses students; engagement levels in educational activities correlated with learning and personal development outcomes (Law, 2015; Kuh, 2001, p. 12). The NSSE survey consisted of six questions that capture three of the five scales (Law, 2015; p. 60):

1. **Active and collaborative learning**. Indicators include students' participation in class, interaction with others in and out of class, and thinking about what they are learning in different settings.
2. **Enriching educational experiences**. Indicators include Internships, co-curricular activities, community service, international experiences, and senior capstone courses.
3. **Student-faculty interaction**. Indicators include students' interactions with faculty in terms of research, career advising, feedback, course-related discussion, and campus committee/activities interaction.

According to Kuh (2001, p. 2), the NSSE is specifically designed to assess how students are engaged in sound educational practices and what they gain from their college experience through an empirical lens and approach. The NSSE survey items used for this study is in Table 4 and Appendix A.

The NSSE is a self-reporting instrument with evidence supporting students' responses to their co-curricular experiences while enrolled in their institution. The reliability and validity of this instrument can be verified through several technical reports (Kuh et al. 2006). According to Carini et al. (2006) and Pascarella, Seifert, and Blaich (2010) found logical relationships between items on the NSSE that were consistent with research about ideal educational practices and valued learning outcomes (Law, 2015; p 61).

Limitation on Survey Engagement

Regarding the validity and representation criticism in the survey, Kuh (2001) acknowledged the challenges and accuracy of validity. (Law, 2015; p. 62). It is important to note that the principal developer of the NSSE, George Kuh recognized and acknowledged additional research and development of secondary instruments that were needed (Law, 2015, p. 62; Wolf-Wendel et al., 2009).

Data Analysis

Data analysis was like Broton and Goldrick-Rab (2020), Maroto (2013), and Law (2015) studies which used descriptive statistics to describe the relationship between academic performance and the occurrence of F.I. and H.I. among nontraditional students enrolled at HBCUs and inferential statistics to make comparisons between the group of students that participated in the survey.

Descriptive Statistics

According to Creswell (2008), descriptive statistics describe the trends in the data sets to a single variable or question (Maroto, 2012, p. 80). For example, descriptive statistics will include frequency and percentages applied to research question 1 to assess the number and percentage of the study population who experiences F.I. and H.I. (Maroto, 2013). The descriptive statistics will compare group differences with t-test. For example, F.I. and H.I. score by gender, race/ethnicity, and the correlation of age with F.I. and H.I. This will help report to a certain extent that the respondents are both experiencing F.I. and H.I. frequently, but not at the same time or simultaneously. If respondents are both F.I and H.I. the researcher will make sure to address the underlying issues in the models described in the analysis.

Inferential Statistics

Inferential statistics are used to compare groups that are the dependent and independent variables. Food and housing secure (students receiving scores of 0,1 or 2 on questions 1-6 of the F.I. and H.I. Screener and one or higher on the BCSSE and NSSE screen questions) and F.I. and H.I. student (students receiving scores of 3 or higher on questions 1-6 of the F.I. or H.I. and 3 and lower on the BCSSE and NSSE screen questions) were compared using inferential statistics including x^2 with the significance level of $P > 0.05$ to answer questions 2 through 6 for the F.I., H.I. and BCSSE, and NSSE screener questions. Linear and logistics regressions were used to examine further the relationship between student demographics, housing stability, food insecurity, GPA, and student engagement through co-curricular experiences. Though the statistical association is currently due to lack of work available; the projected process retrieves this data was analyzed using SPSS by completing the statistical association between F.I. and H.I. and GPA with the addition of the constant factor such as age, race, gender. This is to help the researcher assess this the extent of F.I. and H.I associated with GPA while removing any influences brought on by individual characteristics. The equations for this may look like:

$$yGPA=b(F.I.) + b(Age) + b(Race) + b(Gender) +e$$

$$yGPA=b(H.I.) +b(Age)+ b(Race)+ b(Gender) +e$$

Protections of Study Participants

All Study Participants were presented with informed consent documents (please see Appendix B) informing them of the purpose and benefits of the study, acknowledging that participation in the study will be anonymous, participation in the study is voluntary, and included the contact information of the researcher and chair of dissertation committee for further information. The Institutional Review Board approved this study of Auburn University (please see the documentation in Appendix B), which provides a level of permission that the methodology employed is to protect the survey respondents had been carefully considered by the researcher. This study does not intend to ask for or collect identifying information such as names, student/banner I.D.'s, addresses, etc. who decide to participate in this study. There are no perceived risks of study participation. Surveys were self-administered by study volunteers, further shielding respondents from the potential stigmatizing occurrences of having to discuss their F.I. and H.I. status with a researcher.

Summary

This study aimed to explore the relationship between the academic performance of nontraditional learners who experience food and housing insecurity at public HSMIs in North Carolina. This chapter detailed the research methodology employed to conduct this study. Due to trying to capture this experience, Intercept Surveys allowed researchers to survey a convenience sample of students attending these specific institutions in North Carolina. A summary of the instrumentation process was also explained in the chapter. Finally, this chapter discussed the data analysis methods that were used to be delivered in the study conclusions and the measures applied to protect the privacy of the study participants.

Chapter IV: Findings

Introduction

This study aims to examine the academic profile of nontraditional students who attend public HBCUs in North Carolina that experience F.I. and H.I. and analyze associations between F.I. and H.I. status and self-reported GPA, level of academic engagement, and co-curricular participation. Unlike basic needs insecurity research, this study focuses on the academic profile of nontraditional students at public HBCUs in North Carolina. Forty-two surveys were completed in the Qualtrics survey system that was divided into three sections were a total of 16 questions from valid and reliable scales created by Maroto (2013), Radimer (1990), and Broton and Goldrick-Rab (2019), the basis for this research results. In this study, this dissertation had four research questions and four hypotheses, and using multivariate and linear regressions, correlational analysis, and descriptive and inferential statistics, the researcher tested each one.

The first section is the descriptive findings of questions 1 and 4 regarding the prevalence of food and housing security among the students as well as the demographic characteristics of students. The second section presents the findings from the hypothesis testing in research questions 1 through 4 examining F.I. and H.I., GPA, and co-curricular activities. The final section reviews the correlation between participation in co-curricular activities and F.I. and H.I for nontraditional students at public HBCUs in North Carolina. However, due to the generalizability of this study, the research results cannot be applied to most contexts, as the G*Power analysis did not reach 89 participants in this study. The hypotheses listed below predicted the significance and the direction of the correlations between the variables, which are as follows:

H1: There is no significant relationship between nontraditional students who participate in co-curricular activities at public HBCUs in North Carolina who report experiences of F.I. and H.I.

H2: There is a not significant relationship based on nontraditional student demographics and experiences of F.I. and H.I. at public HBCUs in North Carolina.

H3: There is no significant relationship between nontraditional students' cumulative GPA earned and experiences of F.I. and H.I.

H4: There is a significant correlation between participation in co-curricular activities and experiencing F.I. and H.I. for nontraditional students at public HBCUs in North Carolina.

These statistical tests aligned with the research purposes and hypotheses stated. The following sections will provide details of the steps associated with the data analysis and current findings, results, and interpretations for each statistical test conducted in this study.

Characteristics of Respondents

This study was conducted in fall 2023 at four HBCUs with a combined headcount of 28,494 students. Characteristics of the college population and these study same are presented in Table 6.

Table 6

Characteristics of Public HBCUs in North Carolina				
Name	**Location**	**Total Enrollment (FTE/ Fall 2023)**	**Female Students**	**Males Students**
NC Agricultural & Technical State University	Greensboro, NC	13,883	8,565	5,320
North Carolina Central University	Durham, NC	7,695	5,647	2,318
Elizabeth City State University	Elizabeth City, NC	2,166	1,199	966
Winston-Salem State University	Winston-Salem, NC	4,776	3,593	1,183
Total Enrollment for Fall 2023: 28,494				

On the four campuses, African American students and female students were oversampled, while white, Asian, Hispanic, and male students were under-sampled. Since this study used a volunteer sampling technique, the responses of participants who volunteered for the study may differ from those who did not volunteer for this study. For these reasons, the data collected for this study cannot be generalized to the overall student population of the four institutions that participated.

Over- and under-sampling was not done purposely and reflected the population that was available and willing to complete the survey during the time the researcher distributed the survey to their respective campuses. The researcher acquired the appropriate permission as a guest researcher on each campus that agreed to participate in the study. The survey was deployed to the four campuses from September 19, 2023, to October 10, 2023. Each institution was instructed to distribute the survey twice a week until the survey closed. In addition, each faculty sponsor agreed to distribute the survey among their students and learning management systems; the response at Winston-Salem State University was a total of 41, and one (1) response from NCCU, while the other two HBCUs were nonapplicable. Potential participants were asked whether they were over 18 and asked to disclose if they were enrolled full-time (12 hrs. undergraduate/ 6 hrs. graduate) at their respective HBCUs. Any potential participants under 18 years of age and not a student on the campus were informed that they were not eligible to complete the survey. Furthermore, students did not have to be approached.

Examining Assumptions for Regressions and Correlations

Before running the inferential statistics, the researcher completed a test to determine the assumptions for regressions and correlations and assess the internal reliability of the survey instrument. The explanations of the results are below. The researcher examined the assumptions for multivariate regressions and correlations. The study had two independent variables, F.I. and H.I., and the two dependent variables, GPA, BCSSE, and NSSE (2021). The data were continuous, which meets the threshold for multivariate regressions. The survey used in the study combines the USDA Six (6) Food Security Survey Module (FSSM) (USDA, 2019) to measure food security, the Housing Insecurity Screener (Broton & Goldrick-Rab, 2019) to measure housing security, and BCSSE and NSSE (Indiana University, 2021) to measure academic profile and engagement. The FSSM and Housing Insecurity Screener surveys employed dichotomous scales, creating options that gave the survey participants answers in absolute responses and their perception of experiencing F.I. and H.I. The BCSSE and NSSE survey employed a three-point mixed rating scale that helped participants provide a broad picture of their co-curricular experiences aligned with their academic experience at their public HBCU in North Carolina. Finally, for the correlational analysis, the variables were assessed in pairs as indicated in H1, H3, and H4.

Independence of Observations

Next, the research tested the independence of observations using the Durbin-Watson Test of Autocorrelation in SPSS. The Durbin- Watson test generates a value that ranges between 0 and 4, with values less than 2 suggesting a positive autocorrelation. The higher the value, such as ranges 2 to 4, there is likely no autocorrelation. As shown in Table 7, the Durbin-Watson statistic was 1.980, which confirms positive autocorrelation. The researcher utilized the independent variables as the predictors and GPA as a dependent variable to provide a more reliable finding.

Table 7

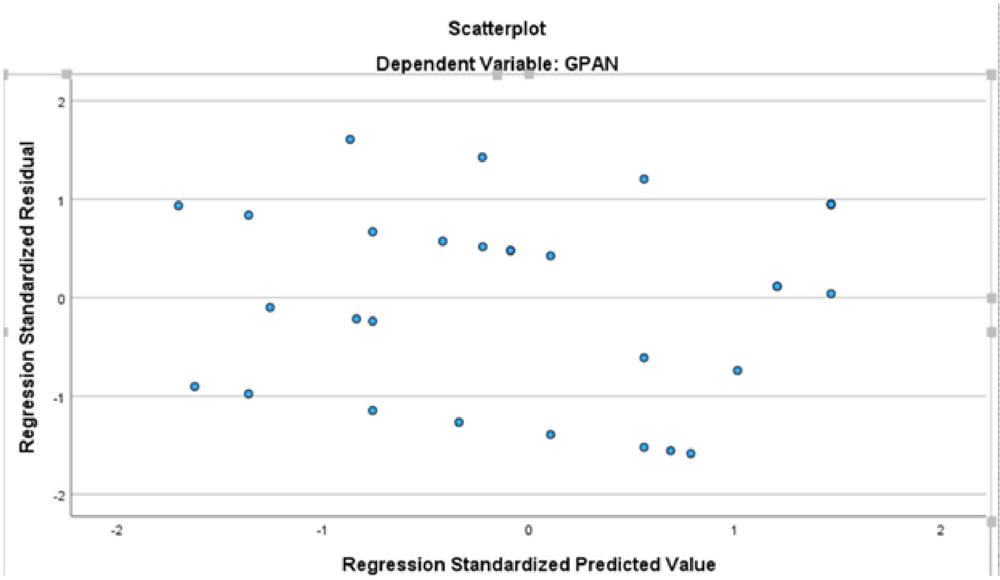
Durbin-Watson Test of Autocorrelation

Durbin Watson	Number of Observation
1.980	42

Linearity

The assumption of linearity specifies that the relationship between the independent and dependent variables should be linear. Scatterplots were used to examine the linearity between variables. The scatterplots showed a positive trend, indicative of a linear relationship. Although the scatterplots did show that linearity was met, possible variability was noted for outliers. The plots reveal that the residuals mostly center around zero, with about the majority lying above and below the zero line (see Figure 5).

Figure 5

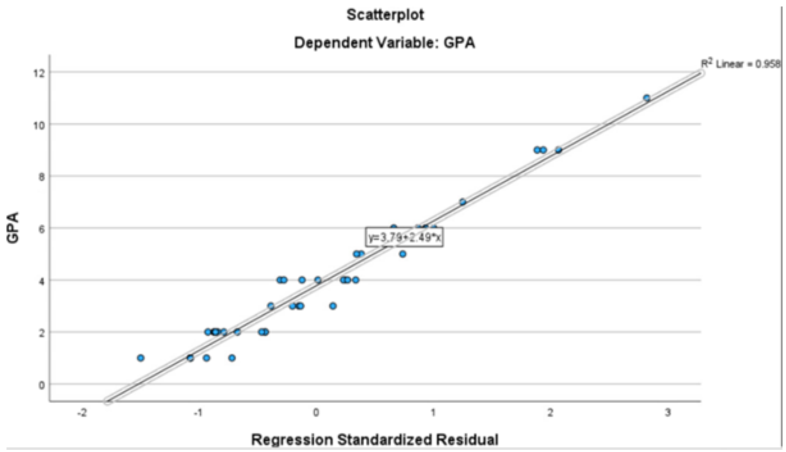


This pattern supports the assumptions of linearity and independence of residuals, suggesting the model is a good fit for the data displayed. However, the presence of a few outliers, specifically, one at residual -1.5 and another at 2, indicates potential concerns that may affect the model accuracy. In conclusion, Robust regression techniques in SPSS were enabled to reduce the impact of the outliers (Urdan, 2022).

Homoscedasticity

The following assumption of regression plot analysis demonstrates the necessity for homoscedasticity of residuals. This signifies that the error variances should be equal across all values of the predicted dependent variable. Figure 6 shows the regression standardized residual plot to test the homoscedasticity, which meets the assumption. The residuals, the difference between observed and predicted values, are plotted against the fitted line in the plots. A constant variance of residuals across the range of independent variables supports the claim of homoscedasticity. Specifically, when the errors usually appear distributed around the fitted values on the vertical range, it suggests that the assumption of homoscedasticity is met (Pope, 2023).

Figure 6



Normality

Lastly, the Shapiro-Wilk test tested the normality to ensure the residuals were normally distributed. The results of the Shapiro-Wilk test, as shown in figure 7, indicate a correlation to the normality in the residuals (p-value = .096). Peer researchers argue that when assumptions of regressions are met with the most accurate estimates, they are less likely to violate assumptions that lead to inaccurate estimates (Wilcox, 2012).

Figure 7

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.137	30	.159	.941	30	.096
Standardized Residual	.137	30	.159	.941	30	.096

a. Lilliefors Significance Correction

Multicollinearity

The Variance Inflation Factor (VIF) was calculated for all the variables in the mode to assess multicollinearity. The VIF values were estimated at 1.371, well below the threshold of 10. Therefore, multicollinearity is not a concern in this model (Urdan, 2022). Though the variables had the same calculations of 1.371, this indicates that this predictor is the least correlated with other variables in the model. The mean VIF of 2.254 further confirmed that the degree of multicollinearity among the variables is moderate and unlikely to impact the results. However, the coefficients can demonstrate statistical significance (p= .472 and p=.198) being that they are less than the pre-determined Cronbach's α (alpha) of the study (Tenny and Abdelgawd, 2024). See Figure 8 for more details.

Figure 8

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	6.286	2.789		2.254	.030		
	FoodInsecurity	1.033	1.422	.133	.726	.472	.729	1.371
	HousingInsecurity	-2.332	1.781	-.240	-1.309	.198	.729	1.371

a. Dependent Variable: GPA

Internal consistency and reliability

The instruments (USDA, 2016; Broton, 2020; Indiana University Center for Postsecondary Research, 2019) have previously demonstrated reliability and validity. Hamilton & Cook (1997) suggest Cronbach's α of .7 to .9 are generally regarded as acceptable reliability values within education and health research. The six (6) items of the F.I. survey have been the instrument of choice and reliability test through the years. According to Maroto (2013), these reliability tests showed values ranging from .86 to .93 on the 12-month scale (p.79). The reliability and validity of the instrument used for H.I. rely on its ability to quantify the underlying characteristics and experiences of the targeted populations at HBCUs. The reliability and validity of the H.I. survey tool will help determine valid estimates that require two inferential steps: (1) survey sample to the target population and (2) measure items in concepts of interest. (Broton, 2020; Groves et al., 2009). The instruments to curate an academic engagement profile through BCSSE and NSSE will be calculated as the mean of selected sections of Cronbach's α. The mean for this instrument was calculated at .787. An alpha value of .70 or higher indicates significant internal reliability (Taber, 2018). The researcher re-evaluated internal consistency and reliability with the current sample, a crucial step in replicating this study, as the relationship between the dependent variables (GPA, BCSSE, and NSSE) and the independent variables (F.I. and H.I.) had been tested among nontraditional learners that attended public HBCUs in North Carolina. The survey instruments demonstrated good internal. The HFSSM instrument was calculated with a Cronbach's α of .655. However, when the researcher deleted questions 1,3 and 4, Cronbach's α reached .759, as depicted in Figure 9.

Figure 9

Reliability Statistics

Cronbach's Alpha	N of Items
.759	3

The BCSSE and NSSE instruments were calculated with a mean of Cronbach's α of .78 (Paulsen & Cole, 2019), depicted in Table 8. As depicted in Figures 9 and 10, this means that this instrument met validity and has high significance within this study.

Table 8

BCSSE	Cronbach's α	NSSE	Cronbach's α
Expected Collaborative	.79	Active and Collaborative Learning	.65

Learning		
Expected Student-Faculty Interaction	.85	
Perceived Academic Preparation	.86	

Mean: .78

Figure 10

BCSSE scales	Cronbach's α
High School Quantitative Reasoning	.78
High School Learning Strategies	.68
Expected Collaborative Learning	.79
Expected Student-Faculty Interaction	.85
Expected Discussions with Diverse Others	.91
Expected Academic Difficulty	.66
Expected Academic Perseverance	.81
Perceived Academic Preparation	.86
Importance of Campus Environment	.85

Confirmatory Factor Analysis of the BCSSE Scales
Indiana University Center for Postsecondary Research
January 2019

However, in this study, the researcher could not demonstrate reliability on the instrument that measured academic preparedness and engagement to calculate Cronbach's α. Cronbach's α 0.44 was calculated for this instrument. When the researcher deleted BCSSE questions 8c,8d, 19a, and 19b, the instrument did not reach Cronbach's α of .70. In turn, looking at data in Figure 12 when looking at the Total Variance explained with these specific questions deleted data expressed in the Cumulative percentage column in components 3 to12. In conjunction, the researcher performed a KMO and Bartlett's Test to determine its P-value at <.001, which makes these specific questions significant within the study, as shown in Figure 11.

Figure 11

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.656
Bartlett's Test of Sphericity	Approx. Chi-Square	31.314
	df	3
	Sig.	<.001

Figure 12

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3.144	26.201	26.201	3.144	26.201	26.201	3.133
2	1.665	13.874	40.075	1.665	13.874	40.075	1.463
3	1.341	11.174	51.249	1.341	11.174	51.249	1.417
4	1.250	10.421	61.669	1.250	10.421	61.669	1.286
5	1.107	9.227	70.897	1.107	9.227	70.897	1.286
6	.871	7.254	78.151				
7	.696	5.800	83.951				
8	.615	5.123	89.074				
9	.440	3.666	92.740				
10	.401	3.342	96.082				
11	.270	2.248	98.330				
12	.200	1.670	100.000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Descriptive Statistics and Findings

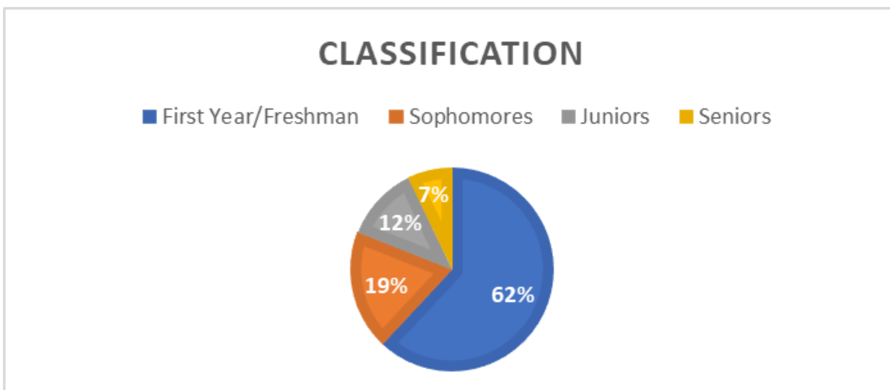
The sample for this study was 42, and the survey included ten specific demographic survey questions:

1. What is your current GPA (Grade Point Average) at this institution?
2. What is your age?
3. What is your classification?
4. What gender do you identify as?
5. What is your living situation?
6. Are you a single parent and/or caretaker of a dependent?
7. Are you a commuter student?

8. Are you enrolled in a meal plan provided by the university?
9. Which of the following do you consider your to be (Check all that apply)?
10. What is your average income per month?

All participants (N=42) responded to the demographic questions, HFSSM questionnaire, Housing Security questionnaire, and selected questions from the 2019 BCSSE and NSSE survey. First Year/Freshman comprised 61.9% of the sample, followed by Sophomores at 19%, Juniors at 11.9%, and Seniors at 7.1%, as shown in Figure 13.

Figure 13



Participants from Winston-Salem State University constituted 97.6% of the sample, and North Carolina Central University at 2.4%. The age range of 18-20 comprised 81% of the sample, ages 21-22 at 11.9%, and age 25+ at 7.1%, as shown in Figure 14. As illustrated in Figure 15, 26.2% of the students reported an earned 3.6 GPA, and 19% reported an earned GPA of 3.0.

Figure 14

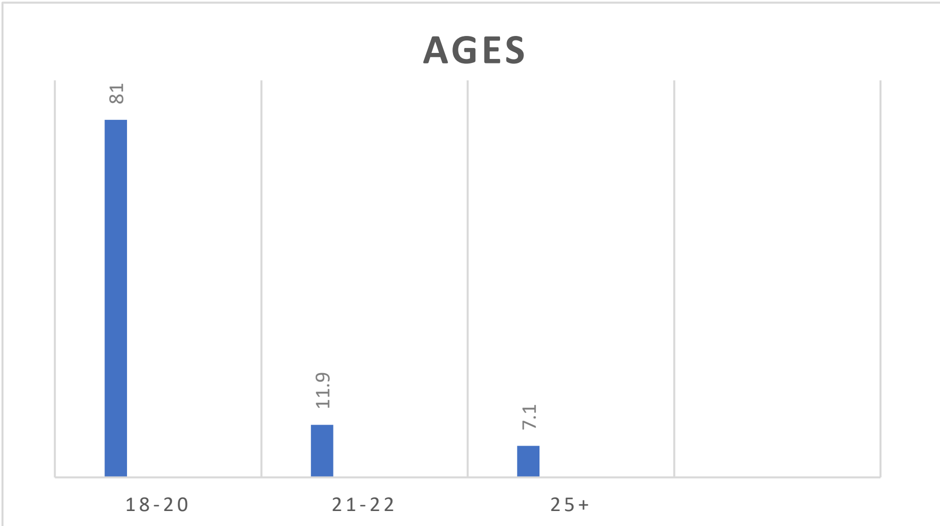
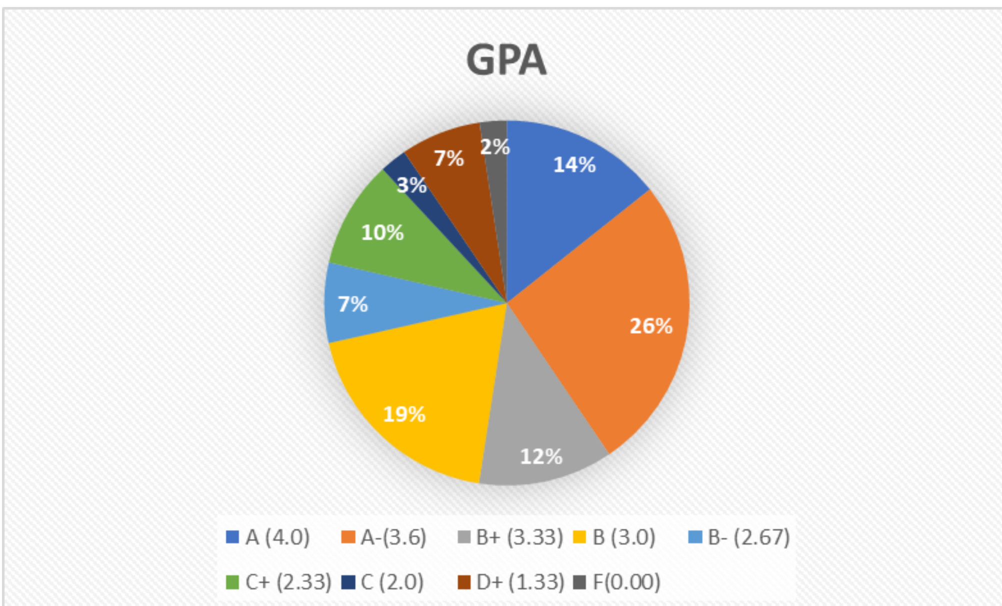


Figure 15



As shown in Figure 16, 88% of the participants reported participating in a meal plan at their respective institutions. In addition, 92.9% of the sample comprised African American/Black, 4.8% White, and 2.4 Bi-Racial (Two races) shown in Figure 17. Table 8 shows that 47.6% of the sample comprised them earning an income of $0-$500. In addition to Table 8, 21.4% self-reported that they didn't know their income.

Figure 16

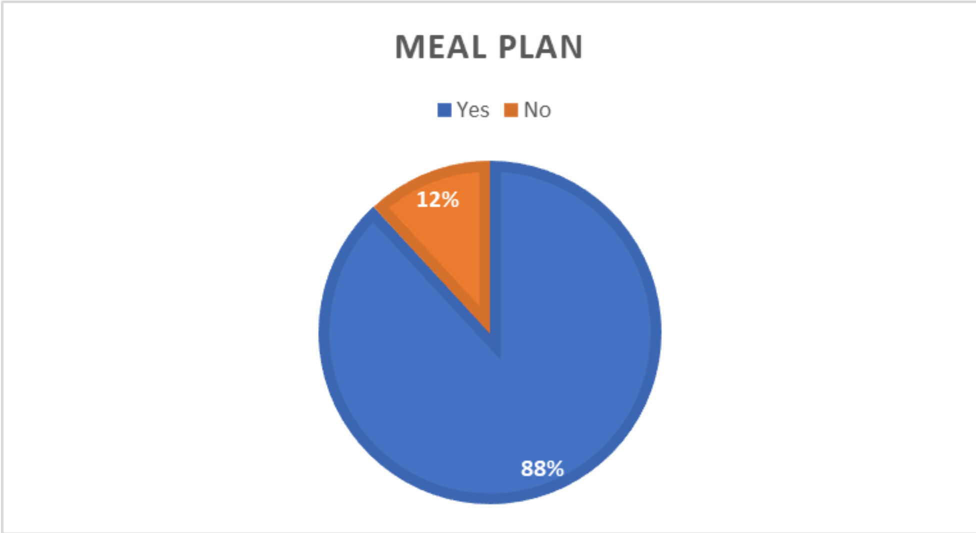


Figure 17

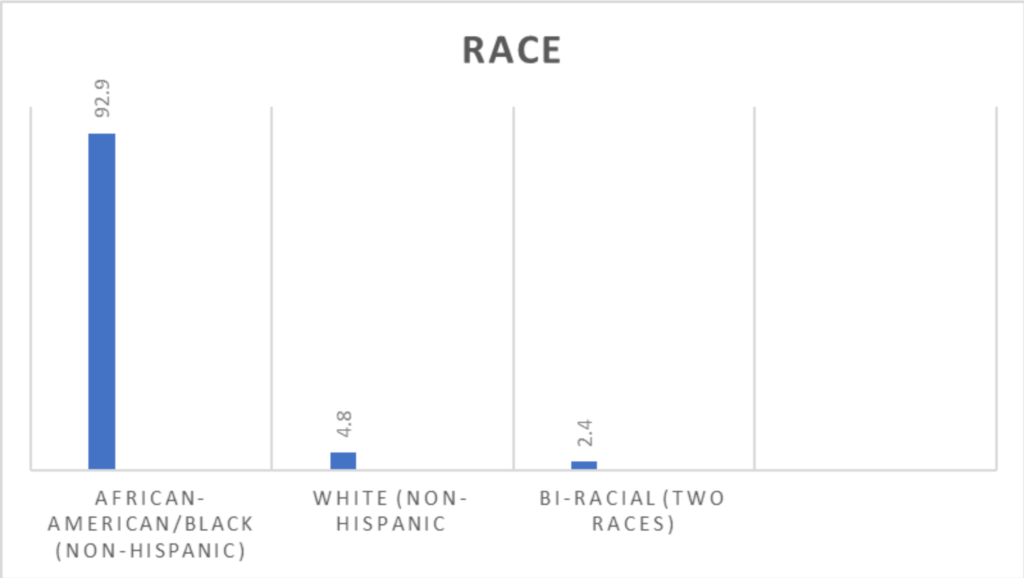


Table 9

	Income	
Income Level	Responses	Percentages
$0-500	20	47.6
$501-750	4	9.5
$751-1000	3	7.1
$1001-1500	4	9.5
$1501-2000	1	2.5

Greater Than $2000	1	2.4
Don't Know	9	21.4

Moving beyond the demographic data related to the sample, additional detailed analysis of the survey results is needed to understand the descriptive statistics, specifically the distributions and variations of the HFSSM, Housing Security, and BCSSE &NSSE data collected. The mean values for F.I. are 1.58 and 1.77 for H.I. These low means scores indicate that respondents, on average, rated these experiences low but show there is occurrence. This implies that the sample perceives the presence of low experiences of F.I and H.I. within their matriculation at their respective institutions. However, there is a high mean value for GPA of 3.79. This suggests that participants are on par with academic performance and engagement, but the rate of occurrence with F.I. and H.I are not as significant. The following section explains additional descriptive statistics to correlate the trends of academic engagement with the low occurrence of F.I. and H.I.

As shown in Figure 18, the standard deviation for all the variables is less than 1.8. This denotes that responses are close to the mean, and there is minimal variability or spread. This finding indicates a general agreement among the respondents about evaluating their academic performance and engagement, the occurrence of F.I. and H.I within the last 12 months completing the survey (Urdan, 2022). Urdan (2022) explained that the survey responses are more similar when the standard deviations are small. The minimum and maximum values range, which leans towards the higher end of the scale, reveals that academic engagement is perceived positively within the sample and supports the respondent's agreement. Table 10 details the scale of responses from respondents in this study.

Table 10

Variable	Obs	M	SD	Min	Max
Food Insecurity	42	1.58	.320	1.0	2.16
Housing Insecurity	42	1.77	.255	1.2	2.0
BCSSE/NSSE	42	2.36	.984	.94	5.0

Please note N=42

Figure 18

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
BCSSE8a	42	2	8	3.26	1.499
BCSSE8b	42	1	5	2.12	1.194
BCSSE8c	42	1	8	1.90	1.708
BCSSE8d	42	1	8	1.90	1.340
BCSSE17a	42	1	4	2.57	.801
BCSSE17b	42	1	4	2.36	.906
BCSSE17c	42	1	4	2.14	1.026
BCSSE17d	42	1	4	2.64	.879
BCSSE17e	42	1	4	2.83	.935
BCSSE17f	42	1	4	2.83	.853
BCSSE19a	42	1	4	2.69	.975
BCSSE19b	42	1	4	2.69	.950
BCSSE19c	42	1	4	2.95	.987
BCSSE19d	42	1	4	1.69	.869
BCSSE19e	42	1	4	2.36	1.078
BCSSE26	42	1	2	1.33	.477
NSSE37	42	1	2	1.93	.261
Valid N (listwise)	42				

Results

The researcher used SPSS to perform multiple statistical analyses, including correlations, multivariate regression, and factor analyses, focusing on HFSSM, Housing Security, and BCSSE/NSSE outcome variables. Regression analyses were performed with specific parameters detailed using G*Power: a 5% margin of error, ad size of $f^{2=}$0.15, a 95% confidence level, and a power of 0.95. The results of the research question and the four hypotheses are discussed in detail below. See Figure 4 for details.

Research Question 1 Results

"To what degree do nontraditional students at public HBCUs in North Carolina report experiences of F.I. and H.I.?" In answering this research question, the researcher applied a one-way ANOVA and found that there was a low statistical relationship between nontraditional students at public HBCUs in North Carolina who report experiences of F.I. and H.I. The researcher used multivariate regressions, factor analysis, and correlation analyses to investigate the relationship between the variables.

The regression data showed a low occurrence with the highest mean for F.I. at 1.81 and H.I. at 1.9 when respondents were preparing for academic and co-curricular activities. The significance of this relationship between the F.I. and H.I. in this research does not exist, with F.I. p=.321 and H.I.= .256. Given the low *p*-values, there is strong evidence rejecting the null hypothesis for the relationship between nontraditional students at public HBCUs in North Carolina reporting experiences of F.I. and H.I. The ANOVA effect sizes for F.I. and H.I. were smaller at a 95% Confidence Interval at .000 due to the G*Power analysis not being met and the small sample size.

Research Question 2 Results

"Is there a significant relationship based on nontraditional student demographics (age, gender, race) and experiences of F.I. and H.I. at public HBCUs in North Carolina?" In answering this research question, the researcher applied a MANOVA and found there was a statistically significant relationship based on nontraditional students and their experiences of F.I. and H.I. The researcher used a general linear model, multivariate tests, and correlation analysis to investigate the relationship between the variables.

The regression data showed a low occurrence, with the highest mean being 2.0 in F.I. and H.I. in respondents who identified as Bi-Racial in the age range of 18-20 years that were First Year/Freshman and Juniors classifications. Given the low occurrence of F.I. and H.I., there is strong evidence of significance between F.I., H.I. and Full-time enrolled students in this sample. When looking at the test between subject effects, the statistical significance is at p=.115 for H.I. and p=.075 for F.I. There is strong evidence rejecting the null hypothesis for the significance of the relationship based on nontraditional student demographics and experiences of F.I. and H.I. at public HBCUs in North Carolina.

Research Questions 3 Results

"Is there a significant relationship between cumulative GPA earned and F.I. & H.I.?" The variables used in this research question were GPA, F.I. and H.I. In answering the research question, a one-way ANOVA found that the series of low standard deviations. This indicates that values are clustered to the mean of this analysis. This also correlates to low mean being detailed amongst F.I. and H.I. When performing the test of Homogeneity of Variances Based on Mean for F.I. p=.698 and H.I. p=.699. In addition, the Mean Square for F.I. between groups was .105 and 086 within groups with p=.325. The Mean Square for H.I. between groups was .066; within groups, it was .069 with a p=.425. Given the low *p*-values, there is strong evidence rejecting the null hypothesis for the significant relationship between cumulative GPA earned and F.I. & H.I.

Research Questions 4 Results

"Is there a correlation between participation in co-curricular activities and experiencing F.I. and H.I. for nontraditional students at public HBCUs in North Carolina?" The variables used in this research question were co-curricular activities, F.I. and H.I. In answering the research question, a correlation analysis found a statistically significant correlation between students participating in co-curricular activities and experience F.I. The data shows a strong positive correlation at p=.001 with Pearson Correlation at p=.520. This data details that if F.I. increases, then the significance of H.I. increases. In addition, the data details that H.I do not strongly correlate because the Pearson Correlation is closer to zero and p=.437. The data show a significant correlation between the variables, but the occurrence is significantly lower. Though there are low p-values, there is evidence to accept the null hypothesis through the significance of the coefficients in illustrated in figure 8 for the correlation between participation in co-curricular activities and experiencing F.I. and H.I. for nontraditional students at public HBCUs in North Carolina.

Chapter Summary

Chapter 4 focused on the statistical findings and results for the four research questions and four hypotheses. Statistical analyses included multivariate regression, correlation analysis, and factor analysis detailing that nontraditional students who experience F.I. and H.I. at public HBCUs in North Carolina have a low occurrence of F.I. and H.I., therefore, answering question four that there is a positive correlation between nontraditional students that experience F.I. and H.I. that participate in co-curricular activities. Various metrics verified the model's reliability and validity. The study also found that although low occurrence of F.I. and H.I. amongst this demographic partially validates the fourth hypothesis. In addition, it displays that students who experience this earn a cumulative GPA of B- or higher in this sample. The hypotheses predicted the strength and direction of the relationship between the variables, and detailed summary of the results presented in Table 11

Table 11

Research Question, Hypotheses, Statistical Tests, and Results		
Research Question and Hypotheses	Statistical Test	Results
Research Question 1**:** **To what degree do nontraditional students at public HBCUs in North Carolina report experiences of F.I. and H.I.?**	One-Way ANOVA	The regression data showed a low occurrence with the highest mean for F.I. at 1.81 and H.I. at 1.9 when respondents prepared for academic and co-curricular activities. The significance of this relationship between the F.I. and H.I. in this research is low, with F.I. p=.321 and H.I.= .256.
H1: There is no significant relationship between nontraditional students who participate in co-curricular activities at public HBCUs in North Carolina who report experiences of F.I. and H.I.		Did not support
Research Question 2**:** **Is there a significant relationship based on nontraditional student demographics (age, gender, race) and experiences of F.I. and H.I. at public HBCUs in North Carolina?**	MANOVA	The regression data showed a low occurrence, with the highest mean being 2.0 in F.I. and H.I. in respondents who identified as Bi-Racial in the age range of 18-20 years that were First Year/Freshman and Juniors classifications. Given the low occurrence of F.I. and H.I., there is strong evidence of significance between F.I.

		and H.I.
H2: There is no significant relationship based on nontraditional student demographics and experiences of F.I. and H.I. at public HBCUs in North Carolina.		Did not support
Research Question 3**:** **Is there a significant relationship between cumulative GPA earned and F.I. and H.I.?**	One-Way ANOVA	The Mean Square for F.I. between groups was .105 and 086 within groups with p=.325. The Mean Square for H.I. between groups was .066; within groups, it was .069 with a p=.425. Given the low p-values, there is strong evidence rejecting the null hypothesis for the significant relationship between cumulative GPA earned and F.I. & H.I.
H3: There is no significant relationship between nontraditional students' cumulative GPA earned and experiences of F.I. and H.I.		Did not support
Research Question 4**:** **Is there a correlation between participation in co-curricular activities and experiencing F.I. and H.I. for nontraditional students at public HBCUs in North Carolina?**	Pearson Correlation Two-Tailed	The data shows a strong positive correlation at p=.001 with Pearson Correlation at p=.520. This data details that if F.I. increases, then the significance of H.I. increases. In addition, the data details that H.I. does not strongly correlate because the Pearson Correlation is closer to zero and p=.437. The data show a significant correlation between the variables, but the occurrence is significantly low.
H4: There is a significant correlation between participation in co-curricular activities and experiencing F.I. and H.I.		Supported in through the evidence of significance illustrated in Figure 8 being less than the predetermined alpha of the study.

for nontraditional students at public HBCUs in North Carolina.	

Chapter 5 provides a synthesis of these findings and theoretical and practical implications and recommends areas for future research, particularly focusing on HBCUs, F.I. and H.I., support, and high-impact practices.

Chapter V:
Discussion, Conclusions, Implications, and Recommendations

Overview of the Study

Chapter five provides conclusions based on the research findings from data collected on four public HBCUs in North Carolina that focus on examining the academic profiles of nontraditional students that attend public HBCUs in North Carolina that experience F.I. and H.I. These institutions were geographically located in parts of the state that are classified as urban/metropolitan, rural/small town, and small city. The study was conducted at four institutions to determine whether the extent and ramifications of F.I. and H.I. differ based on their student demographic, academic performance, and economic conditions. Relationships between F.I. and H.I., student GPA, academic profile, and income level were examined. This chapter will review the purpose of the study, research questions, literature review, and findings of this study. It will then present conclusions, discussions of the conclusions, and recommendations for practice for current and future research.

Previous studies at non-HBCU four-year institutions showed that college students might experience food and housing insecurity at a rate that exceeds the national average (Maroto, 2013; Chaparro et al., 2009). Research on food and housing insecurity that occur at HBCUs, specifically public HBCUs, was missing from the literature.

This study was conducted using a quasi-experiment design, cross-sectional, intercept survey designed to assess the occurrence of food and housing insecurity, academic profiles, and co-curricular activities statuses of a convenience sample of 42 students over 18 attending four different public HBCUs in North Carolina. Food security status was assessed using the validated 6-item Household Food Security Survey Model (HFSSM), 6-item Housing Security Survey Model, and specific questions from the Indiana University Center of Postsecondary Research National Survey of Student Engagement. The survey also contained questions about student GPA and demographics (gender, age, race/ethnicity, income, and enrollment status). Survey results were coded and entered via SPSS for analysis. Descriptive Statistics were used to describe correlations between the academic profiles and the occurrence of food and housing insecurity among students enrolled at the four public HBCUs in North Carolina.

Furthermore, ANOVA analysis assessed potential correlations between food and housing insecurity, GPA, and co-curricular activities. Results were analyzed by demographic group to assess whether there are differences between students based on gender, race/ethnicity, income, and GPA. Multiple regression analysis was used to determine independent variables on the dependent variables (F.I., H.I., GPA, BCSSE/NSSE). All relationships tested above the 0.05 significance levels, making the significance weak but the mean of all variables low in occurrence.

This study was designed to answer four research questions:

1) To what degree do nontraditional students at public HBCUs in North Carolina report experiences of F.I. and H.I.?
2) Is there a significant relationship based on nontraditional student demographics (age, gender, race) and experiences of F.I. and H.I. at public HBCUs in North Carolina?
3) Is there a significant relationship between cumulative GPA earned and F.I. and H.I.?
4) Is there a correlation between participation in co-curricular activities and experiencing F.I. and H.I. for nontraditional students at public HBCUs in North Carolina?

The following three sections discuss the results of the study considering these research questions. The first section discusses the prevalence of F.I. and H.I. and demographic characteristics associated with GPA and co-curricular activities. The second section discusses the correlations between the correlation between participation in co-curricular activities and experiencing F.I. and H.I for nontraditional students at public HBCUs in North Carolina. The third section discusses the F.I., H.I., and GPA. This discussion is framed in the context of previously published research and the results of the present study.

Discussion

Food & Housing Insecurity and Affected Demographic Groups

This study's conceptual model presented demographic factors expected to predict F.I. and H.I. (Figure 1). The findings of this study did not confirm a significant relationship between F.I. and H.I. and demographic factors (race/ethnicity, enrollment status, dependents, age, etc.). The occurrence of F.I. and H.I. among HBCU students and the relationships between student demographics and F.I. and H.I. will be discussed in this section.

In this study, 57.1% of the student sample was food insecure, and 23.8% were housing insecure. The F.I. and H.I. rates among the student sample are higher than the prevalence for the general population of the United States. According to The Hope Center at Temple University (2023), 23% of undergraduates and 12% of graduate students are experiencing food insecurity (McKibben et al., 2023). In addition, The Hope Center at Temple University (2023) reports that 8% of undergraduates and 5% of graduate students are experiencing homelessness (McKibben et al., 2023). One possible explanation for this elevated rate of F.I. and H.I. numbers of African Americans exceeding the study sample could be that this study is focused primarily on public HBCUs in North Carolina but is known to have rates of basic needs insecurity exceeding the national average (Maroto, 2013). According to The Hope Center at Temple University (2023), 38.8% of students experience "low or very low food insecurity," and 12.5% experience H.I./homelessness. The rate of F.I. (57.1%) and H.I. (23.8%) among students found in this study exceeds the national rate, indicating that race is not the only factor leading to the elevated F.I. and H.I. occurrence among the student sample.

HBCU students are experiencing many hardships described by Macke et al. (2023) and McKibben, Wu, and Abelson (2023), where students were balancing work and academics and struggling with the increasing financial cost of attending college each semester. The reasons for F.I. and H.I. among students enrolled at public HBCUs in North Carolina were not the focus of the present study and present an opportunity for further investigation in future studies.

Though the significance of F.I. and H.I. was weak in this study, it is projected by The Hope Center at Temple University (2023) that research found alarmingly high rates of hunger and homelessness—35 percent and 12 percent, respectively—among college students (New, 2023). This finding was somewhat surprising given the location of the participants and the universities represented in a geographic area; however, the median income and basic needs insecurities reflect the needs of the students. According to Feeding America, about 1.5 million people in North Carolina are struggling with basic security needs. In the two counties where the HBCUs are located, Forsyth County is estimated to have 18.5% of its population living in poverty (Forsyth County Community Health Assessment Report, 2021). Durham County is estimated to have 14.1% of its population living in poverty (Durham County Community Health Assessment 2021). These findings suggest that while four-year public

HBCUs located in urban or low-income areas may have more severe issues with F.I. and H.I., their counterparts (PWIs) may also have large number of students who are having trouble affording adequate basic needs. When assessing the levels of security among the study sample, the occurrence of “very low food insecurity” and “very low housing insecurity," which is the most severe form of insecurity, was not statistically significant but does indicate that students who attend HBCUs are experiencing or exposed to a moderate level of food and housing insecurity. These occurrences indicate that eating patterns intake have been reduced or disrupted and safe lodging has been disrupted (United States Department of Agriculture Economic Research Service, 2010).

In the present study sample, 57% of students responded “*yes*” to the question “*Any days: Did you ever cut the size of your meals because there was not enough money for food?”.* Of the 57% that responded “*yes*" to that, 42.9% responded that this happened "*Some Months but not every month*”. Furthermore, 64.3% responded "*no*" to the question, “*In the last 12 months, which of these situations applied to you: Have you paid the full amount of utilities (water, gas/electricity, phone, internet)*?”. When assessing the data between students who experienced H.I. and commuting to campus, 40.5% of the respondents said they spent 1-5 hours total commuting to and from campus via ride-share, driving, walking, and public transportation). African American race and female gender would predict a higher risk of F.I. and H.I. in this study's theoretical model. In the general U.S. population, 25.1% of African American households are food insecure (Coleman-Jensen et al., 2012b; Maroto, 2013). In addition, females make up 64% of the HBCU Enrollment (NCES,2023). In this sample, 64.3% overall responded “*no*” to the question of, “*In the last 12 months, which of these situations applied to you: Have you paid the full amount of utilities (water, gas/electricity,* *phone, internet)*?". Of this 64.3%, 69.7% of females surveyed "*no*" to the questions *"In the last 12 months, which of these situations applied to you: Have you paid the full amount of utilities (water, gas/electricity, phone, internet)*?" Though Hispanic/Latinx race was also included in this theoretical model as a factor respondent they were not represented to quantify the occurrence of F.I. and H.I. Though this specific racial demographic was not the focus of the present study there is an opportunity for further investigation in future studies on the occurrence of F.I. and H.I. and Hispanic/Latinx students that attend HBCUs. In addition, this theoretical model can support students who identify as LGBTQIA+. However, gender identity was not the focus of the present study. There is an opportunity for further investigation in future studies into the occurrence of F.I. and H.I. and LGBTQIA+ students who attend HBCUs.

Food & Housing Insecurity and Co-curricular Activities

This study presented two specific sets of variables that were expected to be predictive of F.I. and H.I. The first set of variables expected to predict F.I. and H.I. was the student's academic engagement and participation in co-curricular activities. This study's findings confirmed a relationship between F.I. and H.I. and specific co-curricular activities. The occurrence of F.I. and H.I. among the HBCU students and the students' participation in co-curricular activities demographics will be discussed in this section. Previously stated in the discussion was that 57.1% of the student sample was food insecure, and 23.8% of the student sample was housing insecure. The F.I. and H.I. rates among the student sample are higher than the prevalence for the general population of the United States. Current and past research does not emphasize academic engagement but focuses more on the student's academic well-being. Particularly in HBCUs, academic engagement and well-being are based on dual practice. When students are not participating in the formal classroom setting, the introduction of and participation in co-curricular activities are just as pivotal to help expand the integration of the material that is taught in the classroom. According to the Bipartisan Policy Center (2024), students who are housing insecure are less likely to complete their degree and have more increased occurrence and risk for other basic needs insecurities. This leaves students who fail to complete their degree programs saddled with student debt without the increased earnings associated with degree attainment. In the students sampled in this study, 26.7% responded that not only did they have trouble paying rent, but it took them 6-10 hours to prepare for class (studying, reading, doing homework) during a seven-day week. In addition, 37.5% of students who responded to having difficulty paying rent in the last 12 months responded that they spent 6-10 hours during a seven-day week participating in co-curricular activities (Student Organization, Greek Organization, Service Learning/Research, SGA, Intramural Sports). According to Kim and Wargo (2022, pg. 20), Students involved in at least seven hours every week with co-curricular activities earned higher GPAs than those who spent one or fewer hours per week. Specifically, in citizenship, students who spent seven or more hours per week earned higher GPAs. Those who spent one or fewer hours per week scored relatively low, showing a significant difference ($p < .05$). Kim and Wargo (2022) argue that the amount of time per week and the number of years that students were actively engaged in extracurricular leadership matters (pg. 20). The Ohio University Center for Study of Student Life states that highly involved students are three times more likely to the job by employers than students who are least involved. In addition, highly involved were rated 18% more career-ready than least involved students (The Ohio State University Center for Study of Student Life, 2024). In addition, 29.4% of the students responded that not only have they experienced difficulties paying rent in the last 12 months but also spent 1-5 hours total during a seven-day week commuting to campus. Furthermore, this study revealed that 60% of the students responded that the food they bought did not last and that they did not have money to get more but spent 6-10 hours in a seven-day week preparing for class. Lastly, 46.7% of the students responded that the food they bought did not last and needed more money to get more spent 1-5 hours participating in co-curricular activities.

Food & Housing Insecurity and GPA

A growing amount of literature implies that students who experience F.I. and H.I. negatively affect them. According to Morris et al. (2016), students with F.I. and H.I. are reported as more likely to experience poor academic performance. Students with a GPA of less than 3.00 are more than likely to experience F.I. and H.I. compared to those with a GPA above 3.00. According to the Institute for Children, Poverty & Homelessness (2019), less than 25% of 40,000 homeless scored high enough to be considered grade level compared to approximately 40% of housed students. Growing research shows that housing instability brings challenges for students, such as increased levels of absenteeism and lack of access and time to educational and student support services (Institute for Children, Poverty & Homelessness, 2019). In addition, when homeless students perform at grade level early in their education, it is projected that their academic performance declines faster than that of their housed classmates. In this present study, 75% of the students that responded "yes" to "*In the last 12 months, which of these situations applied to you: Any days did you ever cut the size of your meals or skip meals because there was not enough money for food?"* reported a GPA of 3.00.

Furthermore, 87.5% reported a GPA of 3.00 when they answered "*yes*" to "*In the last 12 months, which of these situations applied to you*: *The last 3+ months did you ever cut the size of your meals or skip meals because there was not enough money for food?*". In addition, 78.3%

responded "*some months but not every month*" when asked how often this occurred. In addition, 64.3% of respondents responded "*no*" when asked, "*Have you paid the full amount of your utilities (water, gas/electricity, phone, internet)?*". Of that 64.3%, 45.5% reported a GPA of 3.67. Though there is no quantifiable research to determine the level of GPA among students who experience moderate levels of housing insecurity, the students who participated in this study showed above-average levels of achievement in academics and co-curricular activities.

Implications

The study on nontraditional students' academic profiles who experience F.I. and H.I. attending public HBCUs in North Carolina has implications for college students, faculty, staff, and administrators. The implications of this study for each of those groups will be discussed in the following section.

F.I. and H.I. may be an issue for many students attending public HBCUs in North Carolina. Students entering college within the HBCUs in the UNC System should consider their ability to afford college tuition, fees, books and transportation, room and board, and access to food. Students should be aware that their ability to afford quality food and housing may impact their matriculation in college. Students who have experienced lifelong poverty may be at higher risk for the dangerous effects of lower academic achievement. Students should be aware of this risk and targeted with support and interventions (warm handoffs) to decrease or eliminate their F.I. and H.I. to increase their chances of academic engagement and success.

College faculty and staff, who are on the front lines and work directly with many students daily, should be knowledgeable of this growing trend of college students as access to HBCUs expands due to political and social unrest in our society. Faculty and staff should be aware and empathetic of the potential role that F.I. and H.I. can play in their students' class participation and co-curricular activities. These professionals can also assist students who are F.I. and H.I. with locating the correct aid and the processes they will go through once they report it.

Furthermore, the results of this study have implications for HBCU administrators. This study suggests that F.I. and H.I. can affect academic engagement. Though research shows that HBCU alumni demonstrate more persistence and positive career trajectory post-undergraduate years, HBCU administrators need to understand that F.I. and H.I. students have lower GPAs, participation in co-curricular activities, and difficulty graduating on time from their respective degree programs. The results of this study have important implications for college administrators because HBCUs are in areas that are considered food deserts, food swamps, and digital/broadband deserts (Nwanji, 2022; Vilme, 2020). In tandem, these are associated with residents experiencing moderate to high levels of housing insecurity. Higher education institutions with high populations of African American students, students who are independent, and students who are single parents should also be aware of the increased risk of F.I. and H.I.

Recommendations

Recommendations for Practice-

For temporary measures for students who are struggling to afford food to investigate sources of government aid and resources (i.e.- SNAP, WIC, TANF) local and on campus food pantries. Students may need to realize they can be eligible for food and housing assistance programs if they meet specific requirements. Students may also benefit from seeking information on meal plan balances by planning and preparing low-cost nutritional meals. This information could be provided directly through summative programming during student orientation, FYE courses, and resident hall programming. In return, HBCUs should seek to provide students with quarterly information regarding food and housing assistance programs and low-cost meal planning.

For long-term measures, HBCUs should start appropriately conduct asset framing and mapping to eliminate deficit perceptions and labels to upscale engagement and procurement of corporate funds, alumni affinity groups, and grants to help offset the educational costs and barriers these students face while attending HBCUs as postsecondary institutions. In addition, student affairs offices/divisions should not solely rely on student fees. HBCU leadership should develop a liaison or permanent position in the division of student affairs and the institutions' office of development and alumni relations to get a better handle on how to engage students on their narrative but ask and engage donors and alumni to retain and create preventative programming/wrap around support services to ensure that if any student is to experience F.I. and H.I., there are resources on campus to use before using federal or state aid. Furthermore, HBCU admissions and financial aid offices could become involved in a soft entry screening of students for F.I. and H.I. as they look through admissions and FAFSA applications via EFC scores and income levels. Students who are flagged as being potentially at risk for F.I. and H.I. could be provided with a standard packet of information regarding external and internal assistance and resources that outline the application processes for aid. Screenings could anonymously provide HBCU offices of Institutional Research to track trends in the occurrences of F.I. and H.I. to respond and provide data-driven equitable solutions. Faculty and advisors who work with these students can attend mandatory professional/ faculty development opportunities on how to hold non-stigmatizing conversations that can aid in retaining students who experience F.I. and H.I.

Recommendations for Future Research

The exploration of F.I. and H.I. among four-year college students is still growing. However, the exploration of F.I. and H.I. solely on HBCUs is in its infancy stages and presents a vital area for further exploration. Because HBCUs are different in location, size and demographics, future studies should be conducted at all 102 institutions to see where needs are really located for each institution. The studies could provide insight into whether students who attend HBCUs in specific geographical areas in the U.S. are experiencing higher, same, or lower rates of F.I. and H.I. F.I. and H.I. data is available on local, state, and federal in the United States.

Qualitative research on the experiences of F.I. and H.I. at HBCUs is also warranted. While the present study shows the extent and a few of the implications of F.I. and H.I., qualitative studies on this topic have the potential to provide a more complete picture and amplify voices that are not at the table when making decisions on policies and legislation that affect their matriculation and overall well-being. Such studies help illustrate and uncover potential variables that work in tandem with intersecting identities.

Finally, while many HBCUs are implementing food pantries on their campuses, more data is needed to measure the effectiveness of the pantry's utilization and program offerings. Future research on nontraditional students that experience F.I. and H.I. at HBCUs occurrence rates before and after nutritional programming, on the reach of the program in terms of the percent of students served, or on the experience of students who utilize on campus more than once would allow HBCUS to learn “best practices” appropriate for their students.

Finally, vote. Exercise your civic duties in all election cycles. Public postsecondary higher education institutions are governed by their state, which reflects the government in power. The government in power then politically appoints a governing board that leans towards their political ideology that sets the standards for the state's postsecondary higher education system and institution governance. This then dictates how that postsecondary institution should operate to meet the bottom line displayed through performance metrics.

Summary

This study was motivated by a desire to investigate F.I. and H.I. variables among nontraditional students attending public HBCUs in North Carolina. Food and Housing Insecurity affects student academic outcomes in conjunction with an adult’s cognitive ability, energy, and concentration levels. Though research for F.I. and H.I. in the K-12 system is abundant and reflects students' basic needs insecurity as a significant barrier to academic success, research is minimal on the HBCU population.

The results of this study indicate that F.I. and H.I. rates among the students that attend public HBCUs in the North Carolina sample exceeded the national average. Though the generalizability of this study was not met, low occurrence and significance was determined in the sample of students represented in this study. African Americans, female students, and students who participated in co-curricular activities-maintained GPAs of 3.0 and better but had trouble maintaining utilities and experienced cutting of meal sizes/portions to make meals 3+ months out of 12 months.

Appendix A. Survey Tool

Food and Housing Insecurity among Nontraditional Students

Please answer all questions to the best of your ability and knowledge.

A. Food Security Questions

In the last 12 months, which of these situations applied to you:

1. The food that I bought just did not last and I did not have money to get more.
   Yes No Don't Know
2. I could not afford to balanced meals.
   Yes No Don't Know
3. Any days: Did you ever cut the size of your meals or skip meals because there was not enough money for food?
   Yes No Don't Know

   3a) (If yes to Question 3) How often did this happen?
   Every Month Some Months but not every month in 1 or 2 months
4. In the last 3+ months did you ever cut the size of your meals or skip meals because there was not enough money for food?
   Yes No Don't Know

   4a) (If yes to Question 4) How often did this happen?
   Every Month Some Months but not every month in 1 or 2 months
5. Did you ever eat less than you felt you should because there was not money for food?
   Yes No Don't Know
6. Were you ever hungry but did not eat because there was not enough money for food?
   Yes No Don't Know

B. Housing Security Questions

In the last 12 months, which of these situations applied to you:

7. Have you had difficulty paying rent?
   Yes No
8. Have you not paid full amount rent?
   Yes No
9. Have you paid the full amount of your utilities (water, gas/electricity, phone, internet)?
   Yes No
10. Have you moved two or more times per year?
    Yes No

11. Have you ever moved in with other people due to financial problems?

Yes No

C. <u>Academic performance</u>

12. During the last academic year, about may hours did you spend in a typical 7 day week doing the following?
    a. Preparing for class (Studying, reading, doing homework)
        a) 0 b) 1-5 c) 6-10 d) 11-15 e) 16-20 f) 21-25 g) 26-30 h) More than 30hr.

    b. Participating in co-curricular activities (Student Organizations, Greek Organizations, school publications, Student Government, Intramural Sports).
        a) 0 b) 1-5 c) 6-10 d) 11-15 e) 16-20 f) 21-25 g) 26-30 h) More than 30hr.
    c. Working for pay off campus
        a) 0 b) 1-5 c) 6-10 d) 11-15 e) 16-20 f) 21-25 g) 26-30 h) More than 30hr.

    d. Commuting to campus (Driving, Walking, Public Transportation, Uber/Lyft)
        a) 0 b) 1-5 c) 6-10 d) 11-15 e) 16-20 f) 21-25 g) 26-30 h) More than 30hr.

13. During the last school year, about how many hours do you expect to spend in a typical 7-day week doing the following?
    a. Reached conclusions based on your own analysis of numerical information (numbers, graphs, statistics).
        Very often Often Sometimes Never
    b. Used numerical information to examine a real-world problem or issue (unemployment, climate change, public health).
        Very often Often Sometimes Never

    c. Reading identified key information from reading assignments.
        Very often Often Sometimes Never

    d. Summarized what you learned in class or form course materials
        Very often Often Sometimes Never

14. During the last school year, how certain were you that you did the following?
    a. Ask another student to help you understand the material.
        Very often Often Sometimes Never

    b. Explain Course material to one or more students.
        Very often Often Sometimes Never

    c. Prepare for exams by discussing or working through course material with other students.
        Very often Often Sometimes Never

    d. Work with others on course projects or assignments.

Very often Often Sometimes Never

e. Discuss your academic performance with a faculty member
Very often Often Sometimes Never

f. Come to class without completing reading or assignments.
Very often Often Sometimes Never

15. During the last school year, how certain were you that you met with or used the following?
a. Faculty members
Very often Often Sometimes Never
b. Academic Advisors
Very often Often Sometimes Never

c. Learning Support Services
Very often Often Sometimes Never

d. Friends or other students
Very often Often Sometimes Never

e. Family members
Very often Often Sometimes Never

16. In the last 12 months, were you a full-time student at this institution?
Yes No

17. Are you a student athlete on a team sponsored by your institution's athletics department?
Yes No

18. What is your current GPA (Grade Point Average) at this institution?
L. A (4.0)
M. A- (3.67)
N. B+ (3.33)
O. B (3.00)
P. B- (2.67)
Q. C+ (2.33)
R. C (2.00)
S. C- (1.67)
T. D+ (1.33)
U. D (0.67)
V. F (0.00)

19. What is your age?
F. 17-18
G. 19-20

H. 21-22
I. 23-24
J. 25+

20. What is your classification?
F. First Year/Freshmen
G. Sophomore
H. Junior
I. Senior
J. Graduate/Professional Student

21. What gender do you identify as?
H. Male
I. Female
J. Trans Woman
K. Trans Man
L. Non-Binary
M. Prefer to self-describe: ___________
N. I prefer not to say

22. What is your living situation?
H. Alone
I. With Parents/Relatives
J. With Spouse/Partner
K. With Roommates off campus
L. With Roommates on campus
M. Local Shelter
N. Other: ________

23. Are you a single parent?
C) Yes
D) No

24. Are you a commuter student?
A. Yes
B. No

25. Are you enrolled in a meal plan provided by the university?
A. Yes
B. No

26. Which of the following do you consider your to be (Check all that apply)?
I. African American/Black (Non-Hispanic)
J. American- Indian/ Indigenous
K. Hispanic/Latinx
L. Asian or Pacific Islander
M. White (Non-Hispanic)

N. Non-Resident Immigrant (indicate nationality) _____
O. Bi-Racial (two races)
P. Unknown

27. What is your average income per month?

H. $0-$500
I. $501-$750
J. $751-$1,000
K. $1,001-$1,500
L. $1,501-$2,000
M. Greater than $2,001
N. Don’t Know

Appendix B.

Informed Consent Document for Academic Performance among Nontraditional Students experiencing Food and Housing Insecurity at public HBCUs in North Carolina

Informed Consent Form

Food for Thought: Exploring the Relationship between Food and Housing Insecurity and Academic Performance Among Nontraditional Students enrolled at Public HBCUs in North Carolina.

Primary Investigator: Jerisha V. Farrer
Doctoral Student, Auburn University, Department of Education, Foundations, Leadership and Technology

Purpose of Study

You are invited to participate in a research study taking place at public HBCU in North Carolina. The purpose of this research is to examine the academic performance of nontraditional students who experience food and housing insecurity. Food and Housing Insecurity relates to concept of having enough food and adequate shelter to live and participate in an active and healthy life.

Should you to decide to participate, you will be given a 31 question, multiple choice survey to complete. The survey will take approximately 20 minutes to complete, and results will be kept anonymous. Surveys will be collected from 300 students.

To thank you for your time.

Foreseeable Risks

There are no known risks related to this research study.

Potential Benefits of the Research Study

Through your participation in this study, researcher will be able to better understand 1) the relationship between academic performance and Food and Housing Insecurity among Nontraditional students enrolled at public HBCUs in North Carolina. This research will be potentially helpful for university administrator and higher education policy makers in developing more equitable measures to fund these institutions and for faculty to engage in more impactful pedagogy to help eliminate and implement preventative strategies like partnerships with neighboring businesses to employ students at a livable wage that coincide with their learning experiences, education on how to understand the process for resources and apply for SNAP aid. By participating in this research study, you are also helping us contribute to the future success of students across the country as well as other HBCUs.

Protection of Confidentially

Your confidentiality is important to us. As a participant your name will remain anonymous throughout the entire research process. A randomize numbering process will be used so that survey results can be tracked without collecting name or any other personal identity or information. No names will be recorded on the surveys.

Following the collection of the surveys, research results will be formulated. Once this process complete, again your identity will no be revealed in any part of the research study or publication of the research material.

Voluntary Participation

Participation in the study is voluntary. There are no penalties of your status at your institution of declining to participate. If you decide to recuse yourself from the study at any time, you are allowed to do so. Though we want you to complete the study, you have every right to withdraw from participation. Withdrawing from this study maintains your protection of confidentiality.

Exclusion of Participation

If you are under the age of 18, for the purposes of this research study, you are excluded from participation in this study.

Termination of Participation

If you do not complete this survey in full, your participation in this study will be terminated and you will not be penalized or receive consequences for doing so. If you intentionally falsify responses or provide duplicate survey entries, your participation in the study will be terminated.

Contact Information

If you have any questions or concerns pre, during, and post the research study, please contact Jerisha Farrer at jzf0046@auburn.edu. If you have any questions regarding the study procedures on campus, please contact Auburn IRB 334-844-5966 or IRBADMIN@Auburn.edu

Consent

I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study.

Name (Printed): ______________________________________

Name (Signature): ___________________________________

Date: ____

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