# Race + Campus Travel Behavior

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**The role of cycling as a significant and ecological mode of transportation has increased. While there is extensive research on K-12 bicycle transportation, there is limited data on bicycling behavior in terms of racial, ethnic and income groups. Therefore, the intent of this research is to look beyond the built environment interventions on two college campuses and explore the impact of race. A survey was developed that focused on the abilities, practices, motivations for and obstacles to bicycle transportation. The results argue that non-built environment variables are associated with student travel behavior. The study did not find an association between race and a student's ability to ride a bike or bicycle ownership. The study does provide evidence of a connection between race and travel behavior.**

## BACKGROUND

The role of cycling as an environmentally sensitive mode of transportation has increased and more cities are encouraging it and other related active transportation opportunities.[1] In the United States, bicycling rates have increased dramatically since 1990. From 1990 to 2009, the total number of U.S. bicycle commuters increased by 64%.[2] Similarly, the 2000 Census and a 2008-2012 survey indicate that bicycle commuting increased more than 60%.[3] The growth is not limited to the US. A similar pattern can be found in Canada, where from 1996 to 2006, the number of bike commuters in Canada rose by 42%.[4]

In the US, increased bicycling is typically seen in eastern and western states. The American Community Survey data shows that bicycle commuting in Washington D.C. increased by 208% between 2000 and 2012.[5] In these communities, increased bicycling equates to more bicycle amenities, such as bicycle lanes, bicycle share programs, bicycle boxes, bicycle boulevards, and other types of bicycle infrastructure.[6] Given this increase in amenities, a relationship appears to exist between bicycling facilities and a higher number of people bicycling.

The fastest growing bicycle demographic, according to U.S. Department of Transportation data, are Black cyclists - doubling from 2001 and 2009.[7] Similarly, the number of Hispanic cyclists in the United States rose 50 percent between 2000 and 2009, compared to 22 percent for White cyclists. While today's White and Latino cyclists complete the same volume on overall trips, the Census indicates that more Hispanics commute to work by bike.[8] The large volume of non-white cyclists is consistent with studies that explore bicycle transportation in kindergarten, elementary school, and junior high schools.[9] Whereas extensive data exists on cycling and schools, there is limited data on utilitarian bicycling behavior across racial, ethnic and income groups. Using the 2001 National Household Travel Survey, Noreen McDonald documented the rates of walking and biking to school among low-income and minority youth. [10] She found that Blacks and Hispanics used active travel modes at much higher rates than whites or higher-income students.[11] But, while McDonald found high rates for minority K-8 students, the same may not be true of minority college students.

## OBSERVATION

Florida Agricultural and Mechanical University (FAMU) is a public, Historically Black College/ University (HBCU) in Tallahassee, Florida. Recognized by the U.S. News & World Report as the top public HBCU in the nation for 2015, FAMU has also received multiple accolades for its sustainability initiatives. But, there is limited evidence of sustainable transportation. Bike lanes, shared roadways and bicycle racks are hard to find. In general, students are rarely seen riding bikes on the FAMU campus. Like FAMU, Florida State University (FSU) is a public university in Tallahassee. But, in contrast to FAMU, FSU is a Predominantly White Institution (PWI). For this research, the students from the two institutions will be used to understand how campus travel behavior is impacted by race.

While FAMU and FSU campuses are both in the City of Tallahassee (COT), their access to bicycling infrastructure varies greatly. The COT bicycling infrastructure, bike lanes and a shared roadway system, is designed to support utilitarian ad recreational bicycle travel across Tallahassee. For FSU, north/south and east/west bike lanes connect the downtown land uses to Florida State University. Similarly, the shared roadway system supplements the existing bike lane network with additional opportunities to easily access the FSU campus. For FAMU, the level of connectivity is quite different. FAMU's COT bike lanes only run north and south and none provide access into campus. The closest bike lanes run along south

Adams, far from the academic center of campus. The COT shared roadway system does not exist by FAMU.

**RESEARCH QUESTION**

While the FAMU and FSU campus environments have significantly different levels of bicycle amenities, the decision to use a bicycle for utilitarian transportation can be influenced by personal factors. For example, an individual's health, perceived safety, their economic condition, bicycle ownership, automobile ownership and more can influence a student's travel mode. For this project, the personal factor is the student's race.

The primary question, "Is there a relationship between race and bicycle use by college students?", will be examined through a series of secondary questions. Does the ability ride a bike vary by race? Does childhood bike ownership vary by race? Does access to travel modes vary by race? Does the primary travel mode to campus vary by race?

If there is a relationship between race and travel mode, the appropriate follow up question is "What are the primary reasons why Black students choose not to ride a bicycle to campus?" Do White students identify the same reasons? Do Hispanic students identify the same reasons? Similarly, what changes would increase the use of bicycles by Black students?

**RELEVANCE**

There are three major themes for becoming a bike-friendly HBCU community - health, economics and equity. Regarding a healthy environment, increased bicycle use (with a reduction in automotive use) is directly related to improving air quality, reducing runoff pollutants and reducing noise pollution. Regarding personal health, increased bicycle use makes for an overall healthier student body. Similarly, a bicycle friendly community has economic benefits. It puts less demand on a university's facilities and infrastructure. Bikes do not have the same wear-and-tear on the roadways as cars and the parking/ storage demands are significantly less. A single bike parking space costs much less than a car's parking space in a garage.

While providing safe and convenient transportation modes provides a more equitable academic community, there is limited scholarly research on the intersection of bicycle infrastructure and race. The work that has been done focuses on transportation justice - who has the power in bicycle infrastructure planning and which bodies are seen utilizing the infrastructure. In "Planning for Diverse Use/rs: Ethnographic Research on Bikes, Bodies, and Public Space in LA," Adonio E. Lugo argues that "extending transport justice to the bike movement means searching for ways to support cycling in diverse communities". [12] In her ethnographic work, Lugo unearths tensions between bike advocates "obsessed with building bike infrastructure" and community members who do not hold such enthusiasm.

**EXISTING LITERATURE**

There are multiple factors that influence bicycle use. The factors are often organized as three classes of variables: built and natural environment, perceptions and demographics.[13] The built and natural environment variables include bikeways, urban form, distance and land uses like a college campus. Perceptions include attitudes, culture and perceived safety. Demographics include income, auto ownership, education, ethnicity and race.

College campuses tend to have more bicycle commuters than non-university settings.[14] While numerous scholars have examined behavior, modal choice, and cycling activities for college-students on and in the immediate proximity of college campuses,[15] more explicit research still needs to be done.[16] Balsas suggests that the routines and behaviors adopted in college, such as cycling to work or school, can be carried on later in life.[17] For "open" college campuses, however, the challenges for active transportation by means of bicycle can be prevalent and somewhat difficult to overcome. For example, a 2009 study of Georgia State University cited a fear of riding alongside Atlanta traffic, as reasons for not bicycling.[18]

Bicycle transportation behavior is influenced by the physical environment. Many point out that the built environment, personal demographics, perceptions, and attitudes about physical activity can be barriers to or facilitators for cycling. The studies typically included mixed modes of transportation.[19] The location and environment of the university has a great deal to do with its students using a bicycle for transportation.[20] Enclosed campuses, in which most of the streets do not include "through" traffic from non-students, tend to have higher rates of students' bicycling for transportation than open campuses, where nearby streets have higher volumes of non-university-related traffic. Barriers for college students when it comes to bicycling are similar to that of the general population; fears of collisions and bike theft, as well as concerns about personal hygiene, are common obstacles.[21] Distance from campus is a prominent factor, along with overall convenience and ease with which one can park his or her bicycle on campus and get to class on time.[22] Additionally, if one attends a university that has a high perceived crime rate, women especially are more likely to feel vulnerable on a bicycle, rather than in a car.[23]

Noreen McDonald's research indicates that the rates of walking and biking to school differed greatly across racial and income groups, with minorities and low-income children having higher rates of active transportation. Low-income and minority groups, particularly Black and Hispanic citizens, use active travel modes at much higher rates than whites or higher-income students. McDonald found that the difference resulted from minority and low-income students' living closer to school, having lower household incomes, and less vehicle access.[24]

The perspective of Black adults was highlighted at a gathering of North Minneapolis residents. The number one concern with biking and walking was the lack of personal safety. The men expressed concern with traveling through and along certain streets or neighborhoods where community violence or crimes are more apparent. The women expressed concerns with sexual harassment by being directly approached and derogatory language often used that vilifies their bodies and physical appearance. The women stated that they preferred walking and biking in groups where there was good lighting and clear pathways, trails or lanes.

## RESEARCH METHOD + DESIGN

The intent of the research is to understand the relationship between bicycle travel behavior of college students and race. Therefore, the survey compares Black and White students in the same college town. Since the data was collected in short period of time and external funding was not available, a cross-sectional design using surveys was employed.

A web-based survey was developed that included twenty-four (24) items that address bicycle access, frequency of use, and attitudes toward bicycling. Twenty of these items fell under one of three categories: demographics, college transportation practices and bicycle use history. A select number of professors volunteered their classes for participation in this study.

Participants completed the online survey at the beginning or end of their class period at the discretion of the professor. The students were given a brief overview of the study's purpose, had to demonstrate consent, could leave the survey at any point or skip any question that they were presented. No connection between respondents and the researcher were established- so the respondents could anonymous. All of the participants were provided with the researcher's names and contact information, in the event that they would like a copy of the results once the data had been analyzed.

After two weeks, 204 students responded. One hundred and two (122) or 59.8 % were FAMU students and eighteen (82) or 40.2 % were FSU students. As expected, 110 or 90.2 % of the FAMU students were Black. Surprisingly, only 47, or 57.3 %, of the FSU students were White.

The limitations of this research included situations that affected or restricted the methods and analysis of the research data. They were the influences that the researcher could not control. The six (6) limitations were:

1. Gender - The results did not closely examine the role of gender. Various studies report that women bicycle less than men, and differences in attitudes largely explain why.[25] Women express greater concern for safety, both fear of being in a collision and fear of being attacked. They report feeling less comfortable bicycling and like bicycling less than men.

2. Time - The surveys were completed over a very limited time period. Also, the surveys were distributed during a 14-day period in the bicycle friendly spring weather.

3. Housing - The results did not differentiate between students that lived on campus versus students that lived off campus. The 1990 Nationwide Personal Transportation Survey found that the average bicycle trip length was 1.99 miles. Distance is an important issue that was only slightly addressed.

4. Self-Selection – Survey respondents had the opportunity to exit the survey at any time. Students that exited the survey probably are not interested in bicycle travel. Incomplete surveys were not included in the final results

5. Varied Environments - The results do not address the major differences between the bicycling reated built envrionment conditions at Florida State University and Florida A&M University. These differences may skew the validity of grouping the results of Black FSU students with the results of Black FAMU students.

6. Generalizations - While the Black students were from two schools in the same college town, broader generalizations about the larger may not be appropriate. The cultural experience of a Black student on an HBCU campus is significantly different that of a Black student at a PWI.

## RESULTS

The results are organized along the three major questions. Question #1 was "Do you ride a bike to campus?". Question #2 was "Why do you choose not to ride a bike to campus?". Question #3 was "What changes would encourage you to ride to campus?". For each question, the results will explore the presence of race and other factors (e.g. enrollment, car ownership, distance, etc). Descriptive statistics are used to summarize the basic features of the data and present quantitative descriptions in a manageable form. They provide a simple summary of the student sample and the measures. With simple graphics, it forms the basis of a powerful summary that enables comparisons across people.

In additon to the traditional demographic questons, three intial questions clarified the students' resources. The first was "Do you know how to ride a bike?" In this survey, 193 respondents or 95.5% of the total valid respondents (n=202) indicated that they can ride a bicycle. Similarly, 196 respondents, or 97.0% of the respondents (n=202) indicated that they "had a bike as a child". Since Blacks and Hispanics use active travel modes at much higher rates than White or higher-income students,[26] the ability to ride was also explored within the context of race and ethnicity. For Black respondents, the ability to ride (95.8%) and ownership as a child (97.5%) were very close to those of White respondents (98% and 100%). To a lesser extent, the same was true with Hispanic respondents (85% and 85%).

The third question asked "What forms of transportation do you own?" In this survey, 31 respondents or 15.2% of the total valid respondents (n=204) own or have regular access to a bicycle. According to Susan Handy, "Individual factors play a dominant role in explaining household bike ownership… factors associated with higher likelihood of owning a bike include better health, greater comfort bicycling, being white and not of Hispanic origin, and higher income."[27] For Black respondents, the bicycle and automobile ownership (6.6% and 57%) were much lower than those of White respondents (33.3% and 88%). To a lesser extent, the same was true with Hispanic respondents (25% and 60%). Handy argues that "one possible reason is that other physical activity forms, such as walking, are more attractive than biking for these respondents, and consequently decrease the probability of owning bikes."

**Do you ride a bike to campus?** In this survey, 16 respondents or 7.9% of the total valid respondents (n=202) ride a bicycle to campus. For Black respondents, riding a bicycle to campus (3.4%) was found to be much less than those of White respondents (17.6%). To a lesser extent, the same was true with Hispanic respondents (10%). A similar disparity was found in comparing FAMU to FSU students, regardless of race. At FAMU, only 2.5% of the respondents rode a bike to campus. At FSU, 15.9% rode a bike to campus.

Using American Housing Survey data, Plaut found that regular bicycle commuters traveled an average of 2.54 miles and 15.3 minutes to work.[28] In this survey, 6 respondents or 37.5% of the total valid respondents (n=16) ride a bike less than 1 mile. Like Plaut's conclusions, 14 respondents or 87.5% of the total valid respondents (n=16) ride less than 5 miles.

**What is the primary reason you choose not to bicycle to campus?** According to Handy, "While good infrastructure is a necessary condition for getting many people bicycling, it is not a sufficient condition for getting most people bicycling."[29] Therefore, participants were asked to identify the primary reason they chose not to bicycle to campus. In this survey, 70 respondents or 37.6% of the total valid respondents (n=194) indicated that the primary reason was "I do not have a bike". The second highest response was 45 or 23.1% respondents indicated "too inconvenient".

While a lack of ownership was the highest reason for Black (36.3%), Hispanic (33.3%), Asian (50%) and White (37.5%) students, the second reason varied for each group. For Back and Hispanic students, the second reason was "too inconvenient". For Asian students, the second reason was "Do not feel safe riding to campus". For White students, the second reason was "Live to far away". For White students, this may be related to the high level of car ownership by white respondents (see Table 04).

Very little difference was found in comparing FAMU to FSU student responses, regardless of race. Both groups of students indicated a lack of ownership (39.0% and 32.9%) as the primary deterrent. Both cited inconvenience as the second reason (24.6% and 21.1%). While the environmental issues cannot be addressed by an institution, ownership can be a goal for any institution.

**What changes would encourage you to ride to campus?** Changes in the built environment have significant associations with travel behavior.[30] Therefore, students were asked if certain changes would "encourage you to ride a bike to campus." Almost 40% of the Black students "agreed" or "strongly agreed" that four (4) changes would encourage the them to ride to campus; a safer environment (46.1%), more bike lanes (45.7%), more bikes racks (41.8%) and a free bike/ ride share service (39.8%). The highest frequency of "strongly agree" was found in response to two changes; 31 respondents or 29.8% of the total valid respondents (n=104) indicated "safer environment" and 31 respondents or 28.7% of the respondents (n=108) indicated "free bike/ ride share service". The identification with safety is consistent with the existing literature and the survey's White respondents.

## CONCLUSIONS

A review of the existing literature, a survey of 200 students and descriptive statistics found that non-built environment variables are associated with a student travel behavior. But, the specific goal for this project was to examine the travel behavior of Black students. The work was organized along three questions - Do Black students ride bicycles to campus? If no, then why don't they? And finally, what changes would encourage bicycle use? In the process, the study introduced a series of secondary issues- ability to ride, ownership, distance and more.

The study did not find an association between race and a student's ability to ride a bike. There was very little difference between the responses of Back, White, Hispanic and Multiple Ethnicity students. The findings were consistent with the Noreen McDonald's documentation of the high level of active travel by young students of color. Like ownership, this study did not find a relationship between race and bike ownership as a child. Almost everyone knew how to ride a bicycle and had a bike - as a child.

The study did find an association between travel mode ownership and race. Black, White and Hispanic students had uniquely different responses. Black students had the lowest bicycle ownership (6.6%) and the lowest automobile ownership (57%). White students had the most travel options with the highest bicycle (33.3%) and automobile (88%) ownership. While Hispanic bicycle ownership rate (33%) was similar to that of White students, the Hispanic automobile ownership (60%) was closer to that of Black students. Bur, discussions of automobile ownership must recognize how cars symbolize social success, represent greater socio-economic freedom and negatively impact bicycle use.

The study provides evidence of a connection between a student's race and their travel practices. Less than four percent (3.4%) of the Black students ride a bicycle to campus. But. more than seventeen percent (17.6%) of White students ride a bike to campus. While the results confirmed the authors personal observations, the findings provide evidence of associations – but not causality.

Regardless of race, a lack of ownership is the primary reason why students do not ride a bike to campus. Black students indicated that two changes would encourage their bicycle use - a safer environment and a bike sharing service. In general, the results suggest that HBCUs can increase bicycle use by improving bicycling conditions. The study offers important insights into the importance of race relative to explaining bicycling behavior. Future studies should examine a finer grain of socio economic factors in order to fully explore the connection between race/ethnicity and campus travel behavior.

## ENDNOTES


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