UNIVERSISITY OF TEXAS AT EL PASO

DATA VISUALIZATION

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INTRODUCTION

We will discuss the food security status of students at the University of Texas at El Paso (UTEP). Data was collected since 2019 to explore the levels of food security as defined by the U.S. Department of Agriculture/Economic Research Service (USDA/ERS) and support interventions such as federal aid, organization assistance, emergency food and other available resources to ascertain gender/ethnic differences in the progress/focus of UTEP students on their degree.

Also, we seek to highlight the relationships between level of food security and students' concentration on studies, delay in completing his/her academic degree and time delayed in completing the academic degree.

BACKGROUND

The term "food security" as defined by the U.S. Department of Agriculture/Economic Research Service (USDA/ERS) refers to access by all people to a safe and adequate diet for an active and healthy life (USDA, 2016a)

The concept of food security commonly includes both physical and economic access to food that meets individual/household dietary needs and considers individual/household food preferences. Household food security is often measured using the 18-item Household Food Security Survey Module (HFSSM) published by the USDA/ERS or the 10-item Adult Food Security Survey Module published by the USDA/ERS. These modules classify households/individuals on a four-point food security scale as marginal/high food security, low food security and very low food security. The 10-item Adult Food Security Survey Module published by the USDA/ERS were considered to explore the levels of food security of UTEP students in various departments.

AIMS

We seek to answer the following questions.

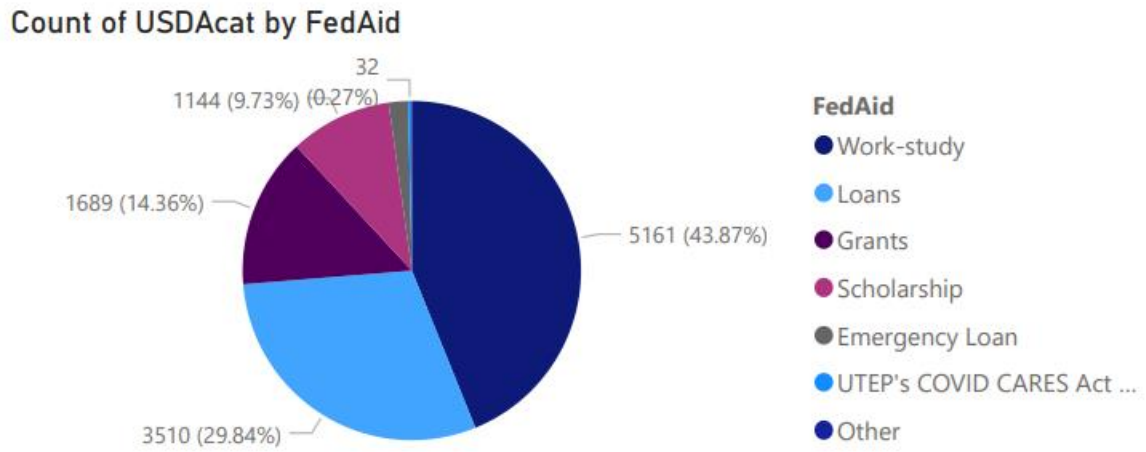
1. How is use of government federal aid/assistance associated with food insecurity as measured by the USDA index or categories?
2. Does food insecurity (as measured by USDA index or categories) have a relationship with the items pertaining to concentration on school and degree progress/completion?
3. Are there gender or ethnicity differences in the items pertaining to concentration on school and degree progress/completion?

METHOD

The data was gotten from UTEP graduate school; preprocessed in R and visualized in Power BI.

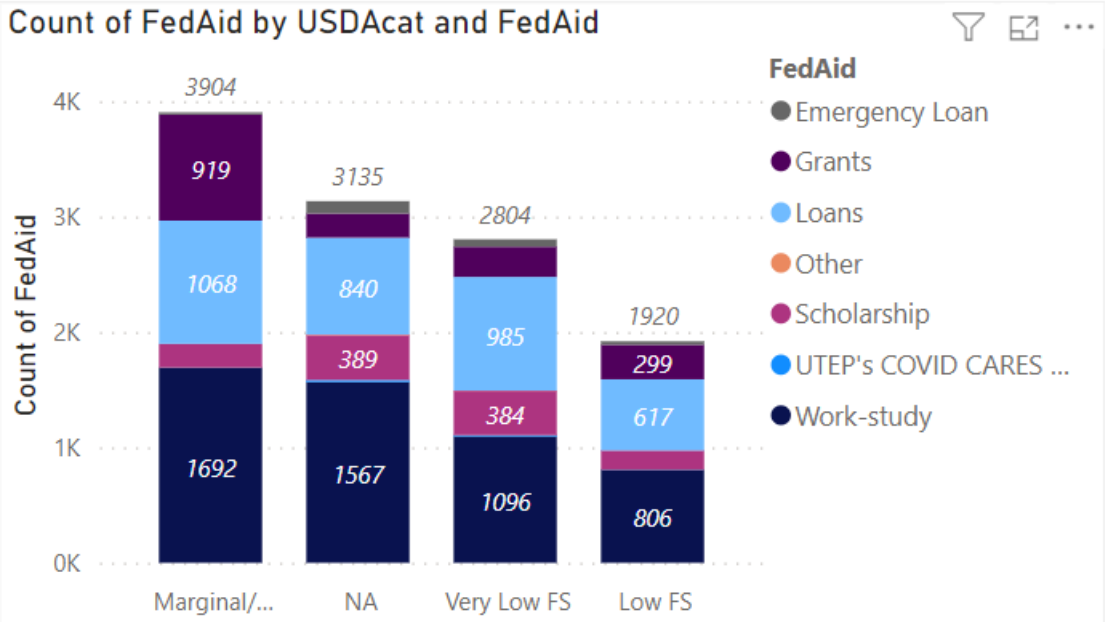
RESULTS

A pie chart was first considered to see how many students receive what form of support interventions.



It can be observed that out of a total of 28574 students who received some form of federal aid, 1144 of the students representing 9.73% received federal aid in the form of scholarships, 1689 of them representing 14.36% received grants, 32 of them representing 0.27% received emergency loans, 3510 of them representing 29.84% received UTEP's Covid Cares Act fund, 5161 of them representing 43.87% received federal aid in the form of work-study arrangement.

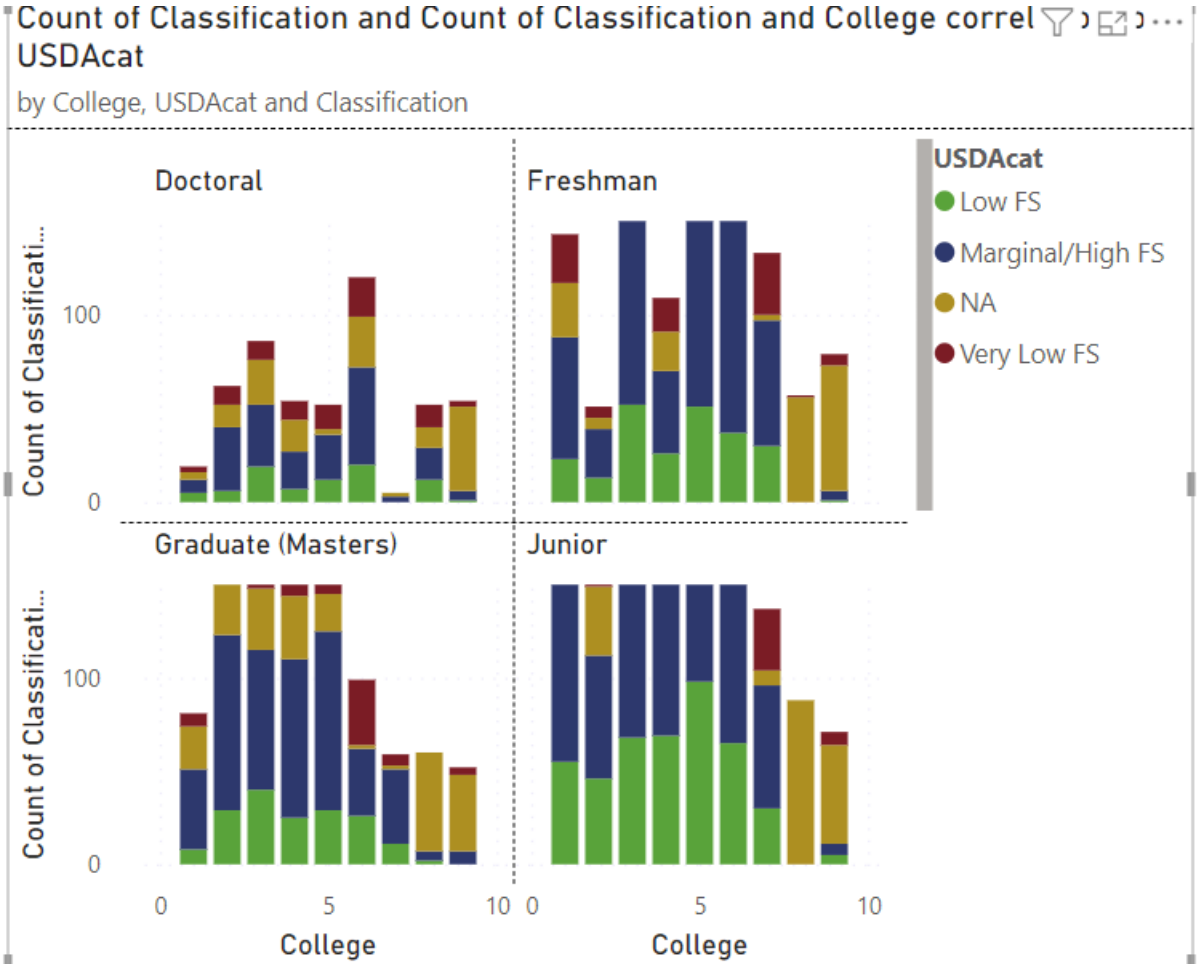
The stack bar chart below explored how many students who received federal aid have what level of food security as defined by the U.S. Department of Agriculture/Economic Research Service (USDA/ERS)



It can be observed from the stark bar plot above that a total of 3904 students have high /marginal food security. Among them, 919 of them received grants, 1068 received loans, 1692 received work study arrangements and a few of them received scholarships.

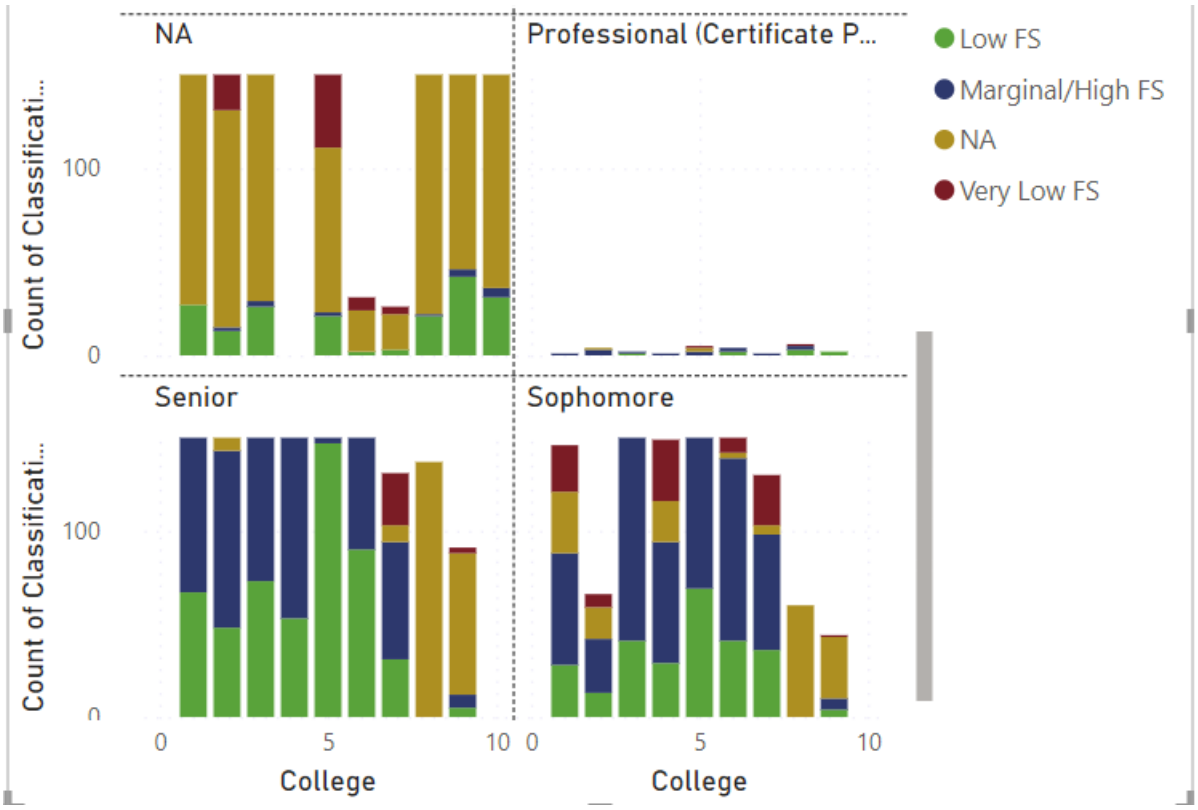
A total of 2804 students were in the very low food security category. Among them, 985 received loans, 384 received scholarships, 1096 has work-study arrangements, a few of them in this category received grants, UTEP's Covid Cares fund and emergency loans.

A total of 1920 students are in the very low food security and among them, 617 of them have loans, 299 of them have grants, 806 of them received has work-study arrangements and a few of them received emergency loan, scholarships and UTEP's Covid Cares fund.



1. *Business 2. Education 3. Engineering 4. Liberal Arts 5. Health Sciences 6. Nursing 7. Science 8. Pharmacy 9. Other*

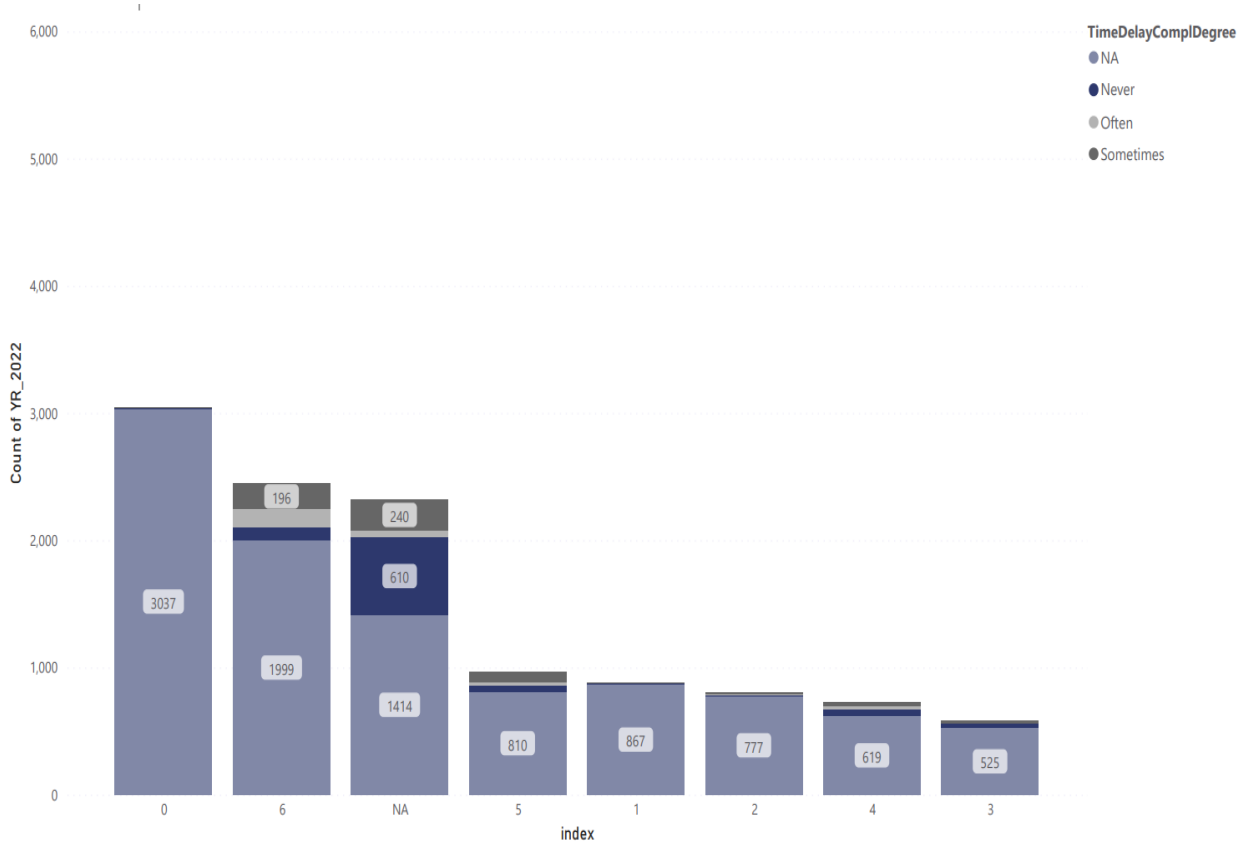
The categories of the x-axis of the stack bar plot above represent different colleges. It can be observed that Juniors in the college of Health Sciences have the highest low food security as opposed to Doctoral students in the college of Health Sciences. It can also be observed that Freshmen and graduates(master) students have marginal/high food security almost across all colleges.



1. *Business 2. Education 3. Engineering 4. Liberal Arts 5. Health Sciences 6. Nursing 7. Science 8. Pharmacy 9. Other*

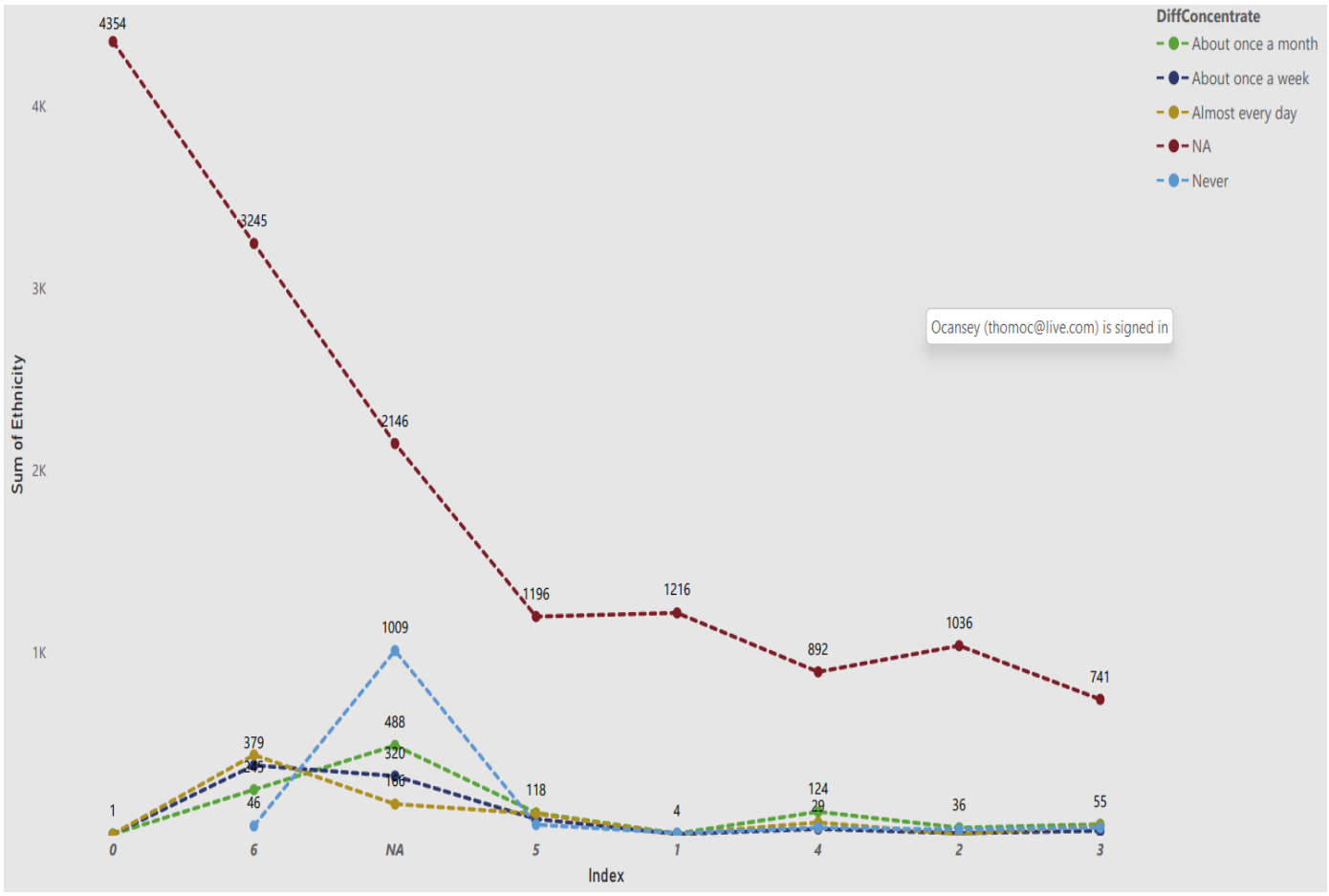
It can also be observed that Seniors in the College of Health Sciences have low food security while Sophomores have marginal/high food security in the College of Engineering.

After exploring the levels of food security in various colleges, academic levels and support interventions, we will now explore if levels of food security as measured by USDA index have any relationships with students' concentration on school, progress/completion of degree.



Index = 0:1 marginal/high food security, index = 2:4 low food security, index = 5:6 very low food security

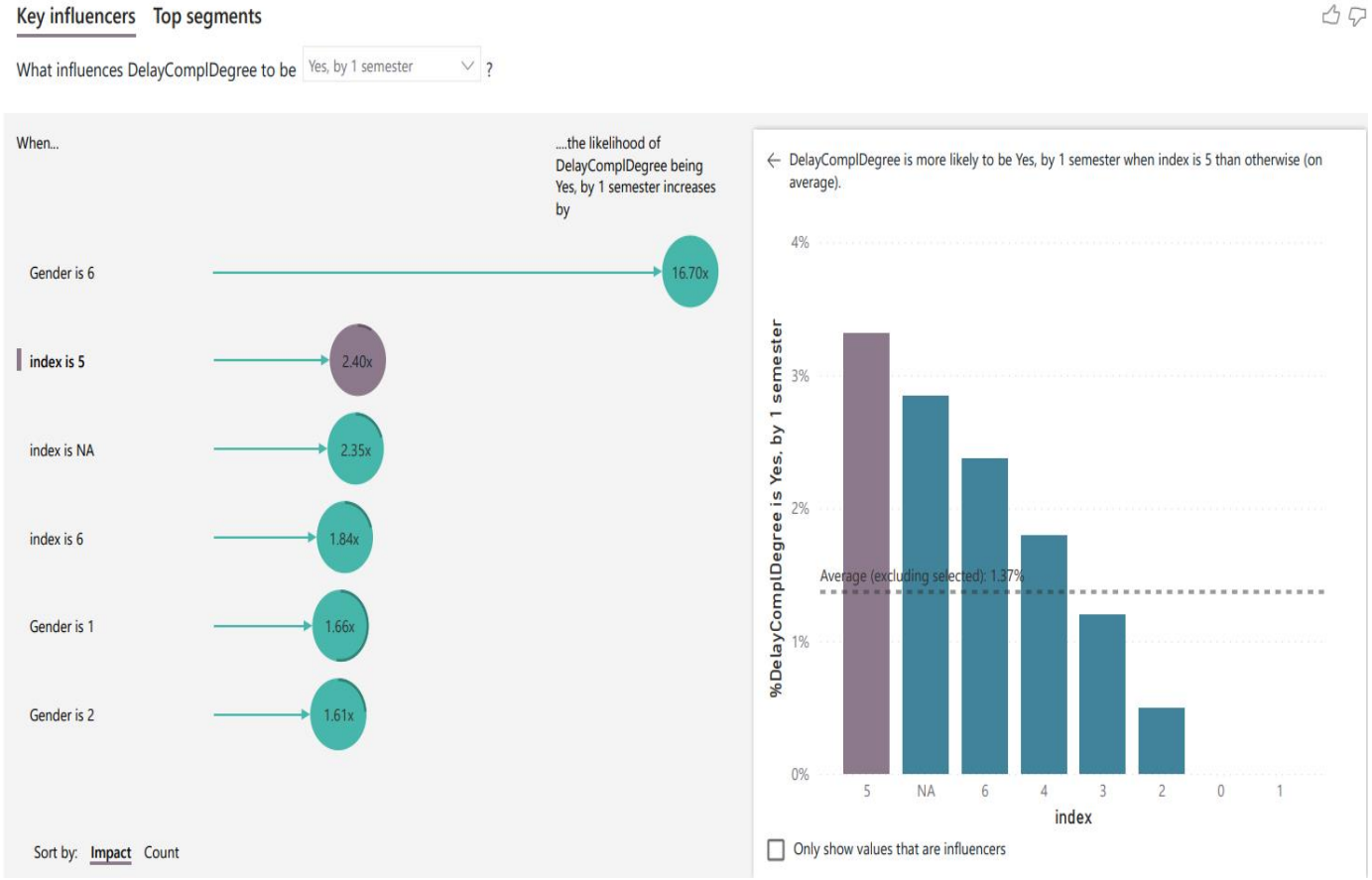
It can be observed from the plot above that marginal/high food security has no impact on delay of completion of degree whiles very low food security often has an impact on the progress/completion of degree.



Index = 0:1 marginal/high food security, index = 2:4 low food security, index = 5:6 very low food security

It can also be observed that students with marginal/high food security have had difficulty in concentrating on school about once month but interestingly students with very low food security have never had any difficulty concentrating on school.

We will now consider if there are gender differences in the delay in completion of degree.

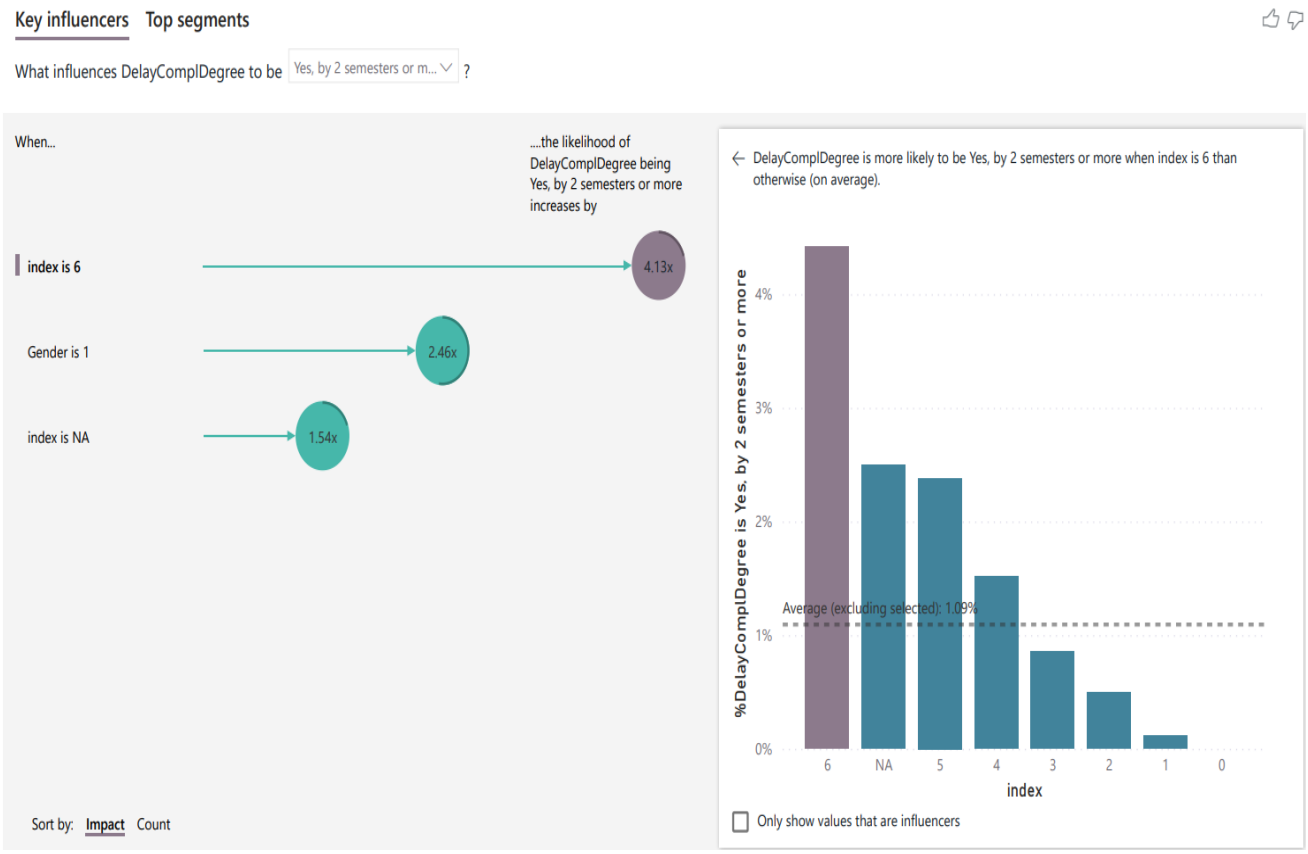


Index = 0:1 marginal/high food security, index = 2:4 low food security, index = 5:6 very low food security

Gender =1 female, gender = 2 male, gender = 3 transgender, gender = 4 gender variant,

gender = 5 other, gender = 6 prefer not to say

In the above plot, we are considering gender and levels of food security as it pertains to students who delay their completion by one semester. It can be observed that students who prefer not to say their gender having very low food security has 16.70 times and 2.40 times respectively higher than the average to delay their completion by one semester.

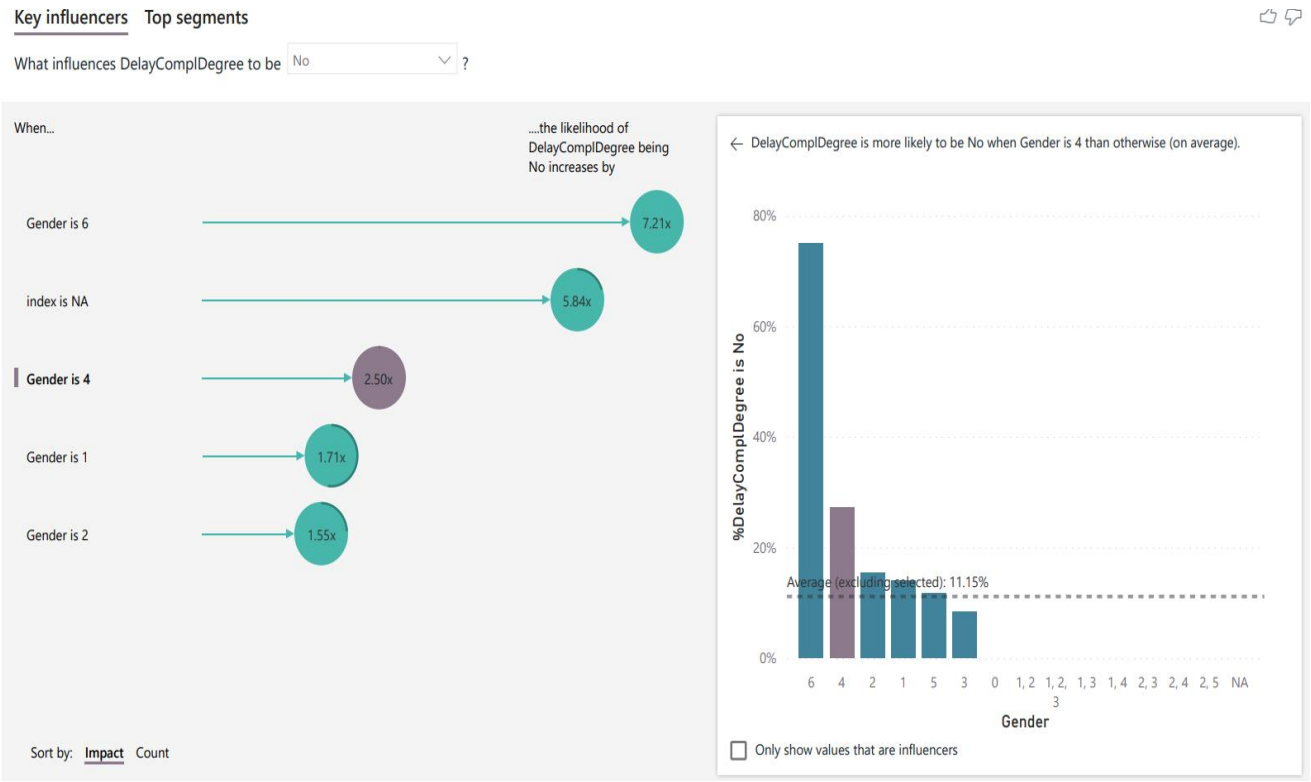


Index = 0:1 marginal/high food security, index = 2:4 low food security, index = 5:6 very low food security

Gender =1 female, gender = 2 male, gender = 3 transgender, gender = 4 gender variant,

gender = 5 other, gender = 6 prefer not to say

From the plot above, we consider students who delay their completion by two semesters. female students with very low food security have 2.46 times and 4.13 times respectively higher than the average to delay their completion by two semesters.



Index = 0:1 marginal/high food security, index = 2:4 low food security, index = 5:6 very low food security

Gender =1 female, gender = 2 male, gender = 3 transgender, gender = 4 gender variant,

gender = 5 other, gender = 6 prefer not to say

Here, we consider students who do not delay their completion. We can observe from the plot above that some students who prefer not to say their gender and have not provided any information on their level of food security are likely not to delay their degree completion.

CONCLUSION:

It has been determined that very low food security has a negative impact on the progress/completion of degree. Among the category of very low food security, female students get highly impacted negatively.

References:

Wilke, C. O. (2019). *Fundamentals of data visualization: a primer on making informative and compelling figures*. O'Reilly Media.

Cuffe, P. (2019). K. Healy: Data Visualization: A Practical Introduction [Book Review]. *IEEE Transactions on Professional Communication*, *62*(3), 310-311.

Danek, A. (2017). *Food insecurity and related correlates among students attending Appalachian State University* (Doctoral dissertation, Appalachian State University).